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Abstract

Should not be of more than 200 words and should state the purpose of the study or investigations, basic procedure, main findings (give specific data and statistical significance if possible) and the conclusion, (emphasize new or important aspects of the study).

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Editorial

Directly Observed Treatment Short-course (DOTS) expanded rapidly in SAARC Region over the period of 1993-1996. By 1996 all Member States implemented DOTS strategy for TB control and 100% geographical coverage was achieved in 2005. Case detection increased from mere 30% in 1997 to more than 54% in 2004 and is expected to reach about 70% by the end of 2006 as per the World Health Assembly and Stop TB Partnership's 2005 target (70%).

The treatment success rate in the region is already 85% in 2003 meeting the 2005 target (85%). This progress has been made possible through strong political commitment and large investments in improved infrastructure, reliable drug supply, increased staffing, improved laboratory services and intensified training and supervision. Increasingly, TB programmes in the region have reached out to a wide range of public and private health care providers in order to increase access to quality services.

In order to strengthen the programme with the delivery of effective and efficient health care services there is a need of development of good communication system within the region. Under this there would be sharing of experiences and achievements in relation to research and other activities. This will help to update and scale up the programme components.

The WHO's Regional Strategic Plan on TB/HIV recommends key strategies and interventions for reducing TB/HIV associated morbidity and mortality through enhanced collaboration between National TB and HIV/AIDS programmes. It is also essential to carry out HIV surveillance among TB patients. Recently, SAARC TB and HIV/AIDS Centre carried out a HIV prevalence among diagnosed TB patients - a cross sectional study in Nepal. Similarly, HIV Seroprevalence among New Smear Positive Pulmonary Tuberculosis Patients in a predominantly rural district in Southern India was carried out by National TB Institute, Bangalore, India. Both of the studies have given useful information in this regard.

STUDY OF HIV SEROPREVALENCE AMONG NEW SMEAR POSITIVE PULMONARY TUBERCULOSIS PATIENTS IN A PREDOMINANTLY RURAL DISTRICT IN SOUTHERN INDIA

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Abstract

Paucity on district level data on the prevalence of Human Immunodeficiency Virus (HIV) infection in TB patients in India, prompted us to undertake this study on HIV sero prevalence among new smear positive pulmonary tuberculosis patients in the district of Mandya. The study design was a cross-sectional one and was carried out during June -August 2005, in a representative sample of 152 new smear positive pulmonary TB (PTB) patients diagnosed in the Designated Microscopy Centers (DMCs) of Mandya district during the second quarter of 2005. The study was conducted in a sample of DMCs selected by stratified sampling. In the selected DMCs, blood samples from required numbers of consecutively diagnosed cases were subjected to HIV testing using Coomb and Tridot tests. A sample was declared positive if the results of both tests were positive. The estimated HIV seroprevalence among PTB cases was 4.6% (95% CI: 4.16-5.04). However, the HIV sero prevalence observed in the present study is much lower than that seen in several African countries. Nevertheless, as there is a large pool of people infected with both HIV and TB in India, there could be a substantial increase of TB cases in future.

Key words: tuberculosis; HIV seroprevalence; India.

Introduction

Human Immunodeficiency Virus (HIV) prevalence among tuberculosis (TB) patients is the most sensitive and reliable indicator for the intersecting epidemics of TB and HIV infections in a community[1]. In India, TB patients are not routinely offered HIV testing. They are referred to Voluntary Testing and Counseling Centers (VCTCs) for HIV testing by a clinician if there is a disclosure of high-risk behaviour or evidence of opportunistic or sexually transmitted infections. The mechanism to institute these referrals, however, is nascent and evolving – the data available from the VCTCs may thus not be representative of the co-infection in the community.

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Several studies on the prevalence of HIV infection in TB patients have been carried out in tertiary health care centers of India. The results widely vary ranging from 0.4% to 28.8% and cannot be generalized to all TB cases in the community[2-5]. The lack of data on TB-HIV co-infection representative of TB cases in a district prompted this study in Mandya- a predominantly rural district in the southern part of Karnataka state, 84% of its 1.7 million population living in villages. As per the sentinel surveillance data, Karnataka is one of the three states in southern India, where the HIV seroprevalence among pregnant women is 1 % or more and are accordingly considered high prevalence states[6].

Methods

The protocol for the study was designed in consultation with the officials of Karnataka State AIDS Prevention Society (KSAPS). Subsequently, the clearance of the Institutional Ethics Committee was taken.

The cross-sectional study was carried out during June -August 2005, in a representative sample of 152 new smear positive pulmonary TB (PTB) patients diagnosed in the Designated Microscopy Centers (DMCs) under Revised National Tuberculosis Control Programme (RNTCP) of Mandya district during the second quarter of 2005[7]. A new TB patient is one who has never received treatment for TB or has taken treatment for less than one month.

A stratified two - stage cluster sampling technique was adopted. The sampling frame comprised of all the 22 DMCs in the district. Based on the average number of new smear positive PTB cases detected during three previous quarters, the DMCs arbitrarily were stratified into three strata - High (>50 per quarter), Moderate (13–50 per quarter) and Low (<13 per quarter) case detection. From each stratum equal proportions (40%) of DMCs were selected by simple random sampling. Thus, one DMC was selected from the stratum of High case detection while three and five centres respectively were selected from the stratum of Moderate and Low case detection. The sample size was allocated to different strata in proportion to their average case detection in the three previous quarters. Within each stratum, the number of cases to be tested was equally allocated to the sampled DMCs. This translated into testing of 69 cases from the High case detection DMC, 16 cases each from the Moderate case detection DMCs and seven cases each from the Low case detection DMCs.

In each DMC, new smear positive patients diagnosed in the second quarter of 2005 were line listed from the Tuberculosis laboratory register and the required numbers of consecutively diagnosed new smear positive PTB cases were included in the study. However, in the event of non-availability of a particular case due to death or any other reason, the case subsequently diagnosed was tested.

The process adopted for HIV testing was both unlinked and anonymous. Each blood sample was divided into two parts -one was subjected to Total Leucocyte Count and Differential Leucocyte Count investigations (DLG) with the results reported to patients and the other was transported to the VCTC at the district hospital for HIV testing. The samples were tested for HIV sero-positivity using a rapid test (HIV Coomb test - based on ELISA principle). In the event of the test being non-reactive, the sample was considered HIV negative. In the event of a positive test result, repeat testing for HIV was carried out by another rapid test using a different antigenic principle (Tridot test - based on the principle of Immuno-filtration and lateral flow-through). A sample was declared positive if the results of both the tests were positive. Samples found sero-reactive on the first test but non-reactive on the second test were considered 'indeterminate'. Strict confidentiality of the data was maintained at all stages of the study. All positive and 5% of the negative samples were sent for re-confirmation to National Institute of Mental Health and Neuro-Sciences the National Reference Laboratory for quality assurance for HIV testing.

The data obtained from the study was entered at NTI in EPI info. The prevalence of HIV infection was estimated as the proportion of blood samples 'positive by two different rapid tests' among the number of samples subjected to HIV testing. 95% confidence interval was estimated using the formula:

$$CI = p \pm 1.96\sqrt{\frac{\sum_{s}\sum_{i}(p_{si} - p_s)^2}{k(k-s)}}$$

Where, p = percentage found in the entire sample

p_{si} = percentage found in the i^{th} cluster of s^{th} strata

k = the total number of clusters

p_s = percentage found in stratums

s = the number of strata

Results

Of 152 new smear positive PTB cases tested in the study, 7 were positive for HIV infection and none of the result was indeterminate. Thus the estimated HIV seroprevalence was 4.6% (95% CI: 4.16 – 5.04). The median age of the study group was 42 years – their age and sex distribution is given at Table-1. The HIV test results stratum wise is depicted in Table-2.

Discussion

Studies on prevalence of HIV infection among TB cases provide inputs for drafting appropriate TB-HIV collaborative activities commensurate with the extent of the co-infection the community.

The present study providing data on HIV sero prevalence at 4.6% among new smear positive cases

of PTB is unique as it is for the first time that an endeavour has been undertaken using all the microscopy centres under the RNTCP of a district in the sampling frame. The study group in this survey was confined only to new smear positive cases. It is a known fact that in the later stages of HIV infection, smear negative and extra pulmonary forms of TB are also common and hence excluding them from the survey is a limitation of the study.

The 2005, annual HIV Sentinel Surveillance conducted by National AIDS Control Organization (NACO), for the first time also included surveillance among TB patients in four districts of India. The HIV sero positivity among TB patients varied between 4.3% in Nasik to 16% in Guntur district[8].

The HIV sero-prevalence observed in our survey in Mandya district is much lower than the 20% to more than 50% seen in several African countries[9]. However, data from several serial studies in India conducted at various tertiary level institutes has revealed an increasing trend of HIV prevalence among TB cases. As there is a large pool of people infected with both HIV and TB in India, there could be a substantial increase of TB cases in the future[10]. Hence, the RNTCP and NACO have chalked a National Action Plan to augment collaborative efforts to contain the co-epidemics of TB-HIV. Periodic repeat studies in the present study area and also in other parts of the country would help to gauge the impact of these measures.

Table 1 Age-sex distribution of patients under the study

Age groups	Male	Female	Total
0-14	1	0	1
15-24	11	15	25
25-34	10	9	19
35-44	28	4	32
45-54	32	4	36
55-64	23	3	26
65 and above	11	1	12
Total	**116**	**36**	**152**

Table 2 HIV test results stratum - wise

Stratum	Name of DMC	No. of Sample Sent	Positive	Negative	Indeterminate result
High Case detection center	Mandya	69	3	66	0
Medium Case detection centers	Maddur	16	1	15	0
	Malavalli	16	1	15	0
	K.M. Doddi	16	0	16	0
Low Case detection centers	Bookanakere	7	1	6	0
	Halagur	7	0	7	0
	Keragodu	7	1	6	0
	Belakavadi	7	0	7	0
	Koppa	7	0	7	0
Total		**152**	**7**	**145**	**0**

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AWARENESS AND HIGH RISK BEHAVIOURS AMONG MIGRANT WORKERS IN RELATION TO HIV/AIDS – A STUDY FROM EASTERN NEPAL

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Abstract

This descriptive study was undertaken to assess the awareness and high risk taking behaviors of migrant workers in relation to HIV/AIDS through interview method.

Majority of migrant workers (94.9%) had heard of HIV/AIDS. But many migrant workers didn't know the symptoms of AIDS.

Most of them (88.2%) were aware that HIV/AIDS could be prevented by using condom (97.3%) and avoiding multiple sexual partners. Three fourth of (74.2%) migrant workers did not use condom during pre/extra marital sexual contact.

Migrant workers (28.2%) went to commercial sex workers although they were aware that this is high risk for HIV/AIDS. Many (67.8%) did not use condom. Another 11.9% workers were going to sex workers at regular intervals and no one using condoms.

So they should be identified, approached and proper educational, awareness programs should be conducted to reach this high risk group, to prevent the spread of this dreaded epidemics. This is big threat to the society and great challenge to the health professionals.

Introduction

In South East Asia Region employment opportunities are decreasing with increase in population, it has 515 million people who live in absolute poverty. Thirty to Sixty Percent of the residents of urban centers live in slums and squatter settlements.[1]

As result it had rapidly became the epicenter of the epidemic, where its huge population include some of the people most vulnerable to HIV/AIDS – mobile workers. The large scale mobile population in this region includes migrant workers from Bangladesh, India, Pakistan, Nepal and Sri-Lanka looking for economic opportunities. HIV epidemic attacks our most vital resources- people in their most productive years. This causes great loss to the families and countries.[2]

Mobility or migration must not itself be a risk factor for HIV, but could create conditions and circumstances, that made the migrant workers vulnerable to HIV/AIDS. Separation from spouse, family, the sensed isolation, loneliness, loss of identity can lead migrant workers to adopt behaviors which made them to be exposed to HIV infection. Migrant

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workers were often socially marginalized and viewed as economic identities with little recognition being given to their human and social identities. What these people have in common is that they work in low paid, unskilled jobs in hostile environment and their vulnerability raised from their need for company, intimacy and sex. Wide spread income, human poverty illiteracy, and the living conditions that they have to adjust deprive people of the information needed to protect themselves from HIV infection and created conditions that place them at risk of HIV/AIDS.

In Nepal, abject poverty, the norm for most Nepalese, also fuels the spread of HIV, as 2 million male migrant workers regularly cross the border facilitating the spread of the virus, similarly thousands of migrant workers cross the borders from neighboring in search of work to Nepal. [3] Nepal's burgeoning prostitution trade contributed to the fuel and spread of HIV transmission mainly through these migrant workers[3], as world wide over 80 of HIV transmission were through heterosexual contact.[2]

The satellite symposium on "Socio-economic causes and consequence of HIV/AIDS, panel on poverty livelihood, migration and HIV/AIDS in South East Asia" held in Thailand in October 1999 stated that there were several social and economic causes for the vulnerability to HIV infection. The first of these was migration, which was mainly male oriented in search of work. Men living in slims away from home should be vulnerable to behavior, which exposed them to infection. The sex workers they often visited were from the neighboring countries. [2]

Hence, this study focused on this special population "Migrant workers" who are being at risk of the contracting and spreading this dreaded infection and disease HIV/AIDS.

The **objectives** of the study were:

- § Assessment of awareness of migrant workers in relation to HIV/AIDS.
- § Identification of risk-taking behaviors that are being practices by migrant workers in relation to HIV/AIDS.
- § Determination of relationship between presence or absence of awareness about HIV/AIDS and high risk behavior among the migrant workers in Dharan.

Methodology

Study design: This study was a descriptive research study undertaken to assess the awareness and risk taking behaviors of Migrant workers in relation to HIV/AIDS.

Setting: All the major constructional sites in Dharan, a town in Eastern Nepal.

Population: All the Migrant workers working at different constructional sites in Dharan, Nepal.

Sample Size: 90 (Ninety)

Sampling Technique: Non probability convenience sampling technique was used to collect data from every migrant laborers, who were available at the time of data collection at the constructional sites.

Development of Research Tools: A Semi-Structured questionnaire was prepared for the migrant laborers working at different constructional sites in Dharan. The broad categories of investigation included questions on bio-demographics along with two other parts in the instrument as specified below.

Part I – It included questions in relation to awareness of HIV/AIDS e.g. sources of information, modes of transmission, sign and symptoms, high risk groups, prevention and treatment.

Part II – It included questions in relation to risk taking behavior that made one vulnerable to HIV/AIDS e.g. extra/pre marital sexual contact, not use of condoms, homosexuality, using I/V drugs and sharing of needles.

The instrument developed was used to interview the migrant workers. Data were collected within two weeks i.e. from 26 November to 8 December 2000. A brief introduction regarding the research process was given and informed consent was taken from all subjects. At the same time confidentiality was maintained by maintaining their anonymity. Data were collected from those migrant workers who were interested to participate in the study. For analysis, data were put in Dbase and converted into Epi Info version-6.

Results

Data were collected from 90 migrants workers working at different constructional sites in Dharan. The study findings showed that average age of migrant workers were 22.5 years (Table 1). Majority of them (93.3%) were in between 15 to 35 years of age. Many (62.3%) migrant workers were living in the slums near the constructional sites where they were working at the time of data collection. Migrant workers were from India (57.8%) and Bhutan (42.2%). The main occupations of migrant workers were mason (44.4%) and labourers (38.8%). Most of them (76.7%) of the migrant workers were literate. About 70.0% of the migrant workers were married. The main reasons for migrations were no job at homes and also better earning opportunities. Some workers also told that they want to escape from family.

Majority of migrant workers (94.9%) had heard of HIV/AIDS. The commonest source of information was friends (84.7%), radio (83.5%), television (56.5%), newspapers (38.8%), and relatives (30.6%) etc. Maximum (96.5%) of the migrant workers were aware about the spread of HIV/AIDS. Majorities of the migrant workers were aware regarding the spread of HIV/AIDS VIZ; unprotected sex (92.7%), unscreened blood transfusion (80.5%), contaminated needles (75.6%). The commonest misconceptions were found to be; through mosquito bite (53.7%), sharing food and shaking hands with a person infected with HIV (36.6%), using public toilet (30.5%), hugging a person infected with HIV/AIDS (26.8%). But many migrant workers didn't know the symptoms of AIDS.

Majority were regarding the high-risk groups for HIV/AIDS. VIZ commercial sex workers (98.8%) person with multiple sex partners (90.6%), person receiving unscreened blood transfusion (76.5%), drug abusers using IV drugs (72.9%). Only 37.6% of the migrant workers regarded homosexuality as high-risk behavior.

Most of them (88.2%) were aware that HIV/AIDS could be prevented VIZ; using condom (97.3%), avoiding multiple sexual partners (96%), avoiding commercial sex workers (92%), screening blood for HIV before transfusion (81.3%, using sterile needles/syringes (70.7%). Some misconceptions were like taking medication before sex (52%), not hugging a person infected with HIV/AIDS (52.0%) could also help in the prevention of HIV/AIDS. Many (74.1%) of the migrant workers regarded AIDS as an incurable disease. Only 63.5% were aware regarding their own vulnerability for HIV/AIDS. Most of them (90.6%) said that infected persons should be kept with the family members. Some (34.4%) of the migrant workers had extra/premarital sexual behavior. Among these, they had sexual contact with friends (26.6%), commercial sex workers (19.4%), sex workers and friends both (9.7%) and with sex workers, friends and neighbors (3.2%). Three fourth of (74.2%) migrant workers did not use condom during pre/extra marital sexual contact. The homosexual behavior was present in 6.7% of them. No one used condom during homosexual behavior. None of them were using intravenous drugs. Less number (3.3%) of migrant workers had history of blood transfusion in the past. Seven percent were suffering from STDs at the time of the study. Having aware about the risk with multiple sexual partners, still 28.2% had sex with multiple sexual partners. Among them 67.8% workers did not use condom for such sexual contact but they were aware that unprotected sex could spread HIV/AIDS. Migrant workers (11.9%) were going to commercial sex workers regularly although they were aware that this is high risk for HIV/AIDS. None of migrant worker used condoms during their visit to sex workers.

About 3.5% of migrant workers were aware that homosexuality could cause HIV/AIDS but they were still having homosexuality. They (2.3%) were having homosexuality act without their awareness that it could cause HIV/AID. Some (1.1%) of them did not agree that homosexuality could cause HIV/AIDS but were having homosexuality. Only 20% of migrant workers were married who were having extra marital relationship. Among them,1.1% workers had homosexual behavior but it was more (5.5%) in unmarried migrant workers. The past history of STDs among married and unmarried workers was 4.5% and 6.7% respectively. Among the married and unmarried migrant workers suffered from STDs in the past, 50% used condom. The STDs were found among the married workers was 2.2%. Only 50% used condom. No one unmarried worker suffering from STDs used condom at the time of sexual act. No history of treatment for STDs was found among them.

Table 1 Characteristics of the Migrant Workers (n=90)

Age	Frequency	Percentage
15-25 yrs	38	42.2
25-35 yrs	46	51.1
35-45 yrs	5	5.6
45-55 yrs	1	1.1
Temporary Address of Migrant Workers		
Categories	**Frequency**	**Percentage**
Slums near constructional sites	56	62.2
Dharan	34	37.8
Permanent Address		
Categories	**Frequency**	**Percentage**
India	52	57.8
Bhutan	38	42.2
Occupation of Migrant Workers		
Occupation	**Frequency**	**Percentage**
Mason	40	44.5%
Labor	35	38.9%
Plumber	9	10%
Constructor/Supervisor	3	3.3%
Painter	3	3.3%
Educational Status		
Categories	**Frequency**	**Percentage**
Illiterate	21	23.3
Literate	69	76.7
Marital Status		
Categories	**Frequency**	**Percentage**
Married	62	68.9
Unmarried	28	31.1
Reason for Migration		
Categories	**Frequency**	**Percentage**
No job opportunity at home	50	55.5
As an opportunity for better earning	50	55.5
As an escape from family situations	17	18.9
Others	8	8.9

Discussion

Studies on certain highly mobile group had identified that traveling or migration as a factor related to HIV infection. Many countries, regions reported higher seasonal and long term mobility also had higher rates of HIV infection. Although research on awareness, prevalence and vulnerability to HIV among migrants were relatively scarce, some studies suggested that migrant workers had a higher chance of infection that their compatriots back home and the population in their host country. Migrant workers are also considered as a source of spreading the virus to their host countries through the sexual network they indulge in and other high-risk behavior.

So this study was focused on finding the awareness and high-risk behaviors among migrant workers (laborers) at different constructional sites in Dharan, Nepal in relation to HIV/AIDS.

Finding from the satellite symposium on the "Socio-Economic Causes and Consequences of HIV/AIDS Epidemic in South Asia on Migration", showed that the highest percentage of migrants to destination both in the region and outside was in the age group of 15-24 years. It was also mentioned that among the several socio-economic causes for the vulnerability of AIDS, the first and foremost was migration, specially male oriented in search of work. Those men living in slums away from home could be vulnerable to behaviors which exposed them to the infection. Also that separation from spouse and family with isolation and loneliness could make migrant workers more susceptible to exposure to HIV and it could be carried back to their families.[2]

This study showed that the average age of migrant workers were 22.5 years. The laborers were mainly residing in slums (62.2%) near the constructional site. They migrated mainly in groups of 3-5 in search of work (55.5%) and for earning better (55.5%). They were employed by contractors at different constructional sites, according to the need and for a specific period of time, till the construction work was completed.

Many (68.9%) were married and (31.1%) were single males; who were living alone. In spite of the category of work they were involved in, interestingly this study findings revealed that 76.7% were literate, one major reason being that 23.3% were students prior to migrating.

They were residing in a group of 3-5 men living in the same room, which was over crowded; they used to cook, sleep and do all other activities there. From morning 3:30 am to 6:30 pm they stayed in the constructional site, but later during their free hours

they went back to their living quarters, which meant that except for their own friends there was no any other entertainment or company which resulted in isolation and loneliness and also a high chance for engaging in high risk behaviors.

Majority (94.4%) had heard about HIV/AIDS VIZ from friends (84.7%) and radio (83.5%), others including television (56.4%), newspaper (38.8%) etc.

Majority (96.5%) were aware regarding the spread of the infection viz; by unprotected sex (92.7%), unscreened blood transfusion (80.5%), contaminated needles (75.6%) etc. Even though high level of awareness was found; misconceptions were also there; for instance (53.7%) said through mosquito bite, (30.5%) said using public toilet, (36.6%) said sharing food and shaking hands with person infected with HIV/AIDS and (26.8%) said hugging a person with HIV/AIDS as mode of spread of the infection respectively.

But in contrast to our study findings, a study done on Bangladeshi migrant[4] workers showed that only 3.3% had proper knowledge, 25.6% partial knowledge and about 62% had no idea about AIDS. Also 41.2% received most of the knowledge from TV and though personal contact.

Majority were not aware regarding the symptoms of AIDS, rather 15.3% gave the symptoms of STDs like; genital ulcers, sore in genital area, discharge from penis. One reason could be that they consider AIDS/ HIV like other sexually transmitted disease in regard to the symptoms.

Regarding awareness about the high risk groups for HIV/AIDS among these people were very satisfactory. They regarded commercial sex workers (98.8%), multiple sex partners (90.6%), person receiving unscreened blood (76.5%) and drug abusers taking IV drugs (72.9%). But only a small proportion (37.6%) regarded homosexuality, as a high-risk behavior for HIV/AIDS.

A majority ((88.2%) were aware that HIV/AIDS could be prevented viz; by using condoms (97.3%), avoiding multiple sex partners (96%), avoiding commercial sex workers (92%, screening blood for HIV before transfusion (81.3%), using sterile needles and syringes (70.7%), and avoid having children after being infected (69.3%) but only 56% knew avoiding homosexuality would prevent HIV/AIDS.

It was revealed by 78.7% that going to a traditional healer would not prevent HIV. Some misconception said for the prevention of HIV/AIDS, being (52%) taking medication before sex and not hugging a person infected with HIV/AIDS, not sharing food or smoking hands with an infected person (36.6%).

Even though the majority routes of spread and prevention of HIV/AIDS, very less proportion were aware regarding homosexuality, one reason could be that it was regarded as a taboo they did not want to express it.

A study on migrant fishermen community in Thailand [5] showed about 60% of those migrants had multiple partners and visited commercial sex workers while away from their homes.

Another behavioral study done in Bangladesh [6] 'Do all High Risk Behaviors come from Abroad' suggested there were various kinds of pre and extra marital sexual activities (44.6%) among migrant workers, which included multiple sex with males and females.

In regard to the high risk behaviors identified, in this study include; that, 34.4% of migrant workers were indulged in extra/pre-marital sexual behaviors having sexual contact with sex workers (19.4%), sex workers and friends (9.7%), friends (22.6%). It was also identified that, 3.2% of had sexual contact with sex workers, friends, neighbors and casual contact separately. It indicates that the person visiting sex workers as well their mates are at a high risk for spreading HIV infection. Also 6.5% of them had sexual contact with relatives, friends and neighbors, friends, neighbors and casual relationship. 12.9% had only casual relationship. Even though this proportion is small, it can be said that, these proportion is spreading the infection to the whole community, through the multiple sexual networks, they were engaged in.

In regard to condom use, a study done on HIV related characteristics of migrant workers in rural South Carolina[7] indicated that 46% never used condoms. This study also found similar results that during pre and extra sexual contact 7.2% did not use condom whereas no one used condom during

homosexual behavior. One reason could be that it might not be available to the workers. This study also found that none of the migrant workers used IV drugs and shared needles for taking IV drugs. The reason could be that migrants came to earn money and for a short period of time they will be residing in a place, as a result proper network for the access for obtaining IV drugs may not be available.

A study on HIV related characteristics of migrant workers in rural South Carolina[6] stated that 16% had reactive serologic tests for syphilis. Similar findings in a project-innovative approach to reach migrants and mobile populations, conducted in India found that 20% suffered from Sexually Transmitted Infections.

A study done on Reducing Risky Behaviors: Insights and Interventions[7] showed that 22% of migrant workers were suffering from STDs. Similarly in this study, 7% of migrant workers were suffering from STDs and did not take any treatment.

A study on Bangladeshi[4] overseas migrant workers stated that 60% of the identified HIV positive persons in Bangladesh were migrant workers or their spouse. The HIV test was not done in this study due to lack of HIV kits and fund.

A study done in Bangladesh,[6] 52.9% migrant workers were indulging in sexual contact with multiple sexual partners.

An experimental study done on Latino[8] migrant workers showed that after the pretest to post test, significantly more experimental group men reportedly used condom during sex with a sex worker, but there were no positive behavioral changes among the control group men .

A fisherman migrant community survey in Thailand[5] found that 60% of migrant workers had multiple partners and visited community sex workers while away from home.

Female sex workers and their clients had been a major determinant in heterosexual transmission of HIV in Cambodia, Myanmar and Thailand. In 1996 HIV prevalence rate among sex workers reached 40% in Cambodia, 25% in Myanmar, 19% in Thailand. The male population engaged in commercial sex and the not regular condom use had been contributed to the rapid and wide spread of HIV.[9]

In the context of Nepal commercial sex workers and their clients specially migrant laborers had been considered as spreading HIV infection to population.

In a study conducted in Nepal[10] it was found that commercial sex workers with low income are forced to entertain a large number of clients and are usually unable to negotiate condom use. In a study done on 103 commercial sex workers in Kathmandu Nepal, it was found that most of them suffering from some type of sexually transmitted disease. This included 30 cases of syphilis, 21 cases positive for HIV infection, 9 cases for HbsAg, 10 cases for N. gonorrhea, 13 cases for T vaginalis.

Similarly this study results found that high risk behavior of having sexual contact with commercial sex workers, even though migrant workers knew that they were high risk of contacting HIV/AIDS (11.8%) and from among these none of them were using condoms.

The reasons could be; condoms were not available or that the workers do not prefer to have sexual contact with the use of condom or that the sex workers engaged even though they were aware of the risk to get financial incentives. They have sexual contact with out condoms.

All these findings support our study findings that condoms are rarely used during sexual contact with commercial sex workers.

This showed that even though some of the sex workers preferred to use condom with migrant workers they rarely used it. This also highlights the high-risk behavior they are taking. One reason could be, condoms were not available or just due to loneliness migrant workers visited them to fulfill an emotional desire or sexual urge so they did not see the point in use of condoms. This also showed that this population living alone could be vulnerable to behaviors which exposed them and also their sexual partners to HIV infection, because the sex workers they visited were from the neighboring countries. Migrant workers were potential source for spread of the infection with the high chance of getting their own self infected form this incurable epidemic.

Also it was found in this study that of the 28.2% who were aware of this high risk behavior for acquiring HIV/AIDS through multiple sexual partners they were also indulged in this behavior. Of the total only 2.3% were indulging in sexual contact with multiple partners without knowing that it could spread HIV/AIDS. The multiple partners included; sex workers friends, neighbor or just a casual contact. In the constructional site which they were working during this period if they showed this type of behavior especially 3.2% were having sexual contact with all these categories there were a high chance of spreading the infection. If there was a slight chance of getting infected from a sex worker, then this 3.2% of the community were also spreading the infection to those of the neighbor, friends or to the casual contact whom they had sex with.

In a study done in Amsterdan[11] to find out the prevalence and risk behavior among prostitute and clients it was found that consistent condom used (with 100% of contacts) was reported by 6% prostitute and 56% of clients of the prostitutes. Inconsistence condom use was found to be high among prostitutes and among migrant clients of prostitutes. A study done in South Carolina,[7] found that from 166 workers who reported frequency of condom use, 77 (46%) indicated they never used condom; 25(13%) were HIV positive. This study found that 67.8% of migrant workers from a total of 28 were aware of the spread of HIV through unprotected sex, but were not using condom. This showed that the low prevalence of condom use among these migrant workers, and shows their high risk behavior. This study also found that 3.5% migrant workers who were having homosexual relationship were also aware of the risk they were involving themselves as they (100%) did not use condom, 2.3% were also having homosexual relationship without the awareness that they could contact HIV/AIDS through this behavior. This study found that migrant workers indulged in homosexuality mainly due to proximity with peers. Form the total, 1.1% did not agree they were also having sexual relationship through this route. In regard to homosexuality we can conclude that most of the migrant workers were not aware of the spread of HIV through this route; so they might be indulging this behavior. Because this mobile group spends most of their time with the peers, it can lead to homosexual behavior in regard to the condom use; they might not use it because it was not available easily and they might prefer not to use it. This has a serious implication.

This study also found that 20% of the total married workers were having multiple sexual partners and 14.4% of the single men was also engaged with multiple sexual partners. Also from the married men a 4.5% had suffered from STD in the past and only 50% used condom. A 2.2% is presently suffering from STD and only 50% have used condom and they haven't done any blood checkup.

Of the single men 14.4% with sexual relationship with multiple partners, 2.2% had suffered from STD in the past 50% used condom and 1.1% who is presently suffering from STD had not used condom and they had not done any blood checkup.

Of the single men who had suffered in the past from STD; 6.5% have had sexual contact with sex workers; 3.2% with friends, neighbors, casual contact, 1.3% only casual contact, 25% used condom; and 75% did not use condom.

Of the men who were suffering from STD at the time of data collection 6.5% had sexual contact with sex workers, 3.2% with casual contact and 66.66% did not use condom only 33.33% used condom.

All these findings concluded that this migrant workers population was vulnerable for contacting HIV/AIDS and also they would be a source for spread of HIV/AIDS. This is mostly due to the conditions that they have to live in and the non availability of condoms.

There was also high chance of having sexual relationships with multiple partners due to loneliness need for intimacy and sex.

Also they play as a means in the spread of the disease; through mobility as most of them who were suffering presently from STDs were also having multiple sex partners, without treatment.

These migrant workers are engaging in high risk behaviors even though they know it. So they should be identified, approached and proper educational, awareness programs should be conducted to reach this high risk group, to prevent the spread of this dreaded epidemic to community.

Conclusion

These migrant workers are vulnerable for contacting HIV/AIDS due to presence of the risk taking behaviors like going to commercial sex workers, multiple partners, homo-sexuality and on the top of that not using condoms as found in this study. Therefore, they would be a potential source for the spread of HIV/AIDS in this place and also back to their country.

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FACTORS RESPONSIBLE FOR NON-COMPLIANCE AMONG TUBERCULOSIS PATIENTS IN KAILALI DISTRICT, NEPAL

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Abstract

Setting : Kailali district

Objectives: To identify the factors responsible for non-compliance among tuberculosis patients in Kailali district Nepal.

Methods: A cross-sectional study was conducted between December 2004 to March 2005, among 130 compliant and 25 non-compliant tuberculosis patients, randomly selected from four DOTS treatment centres, using a structured questionnaire with face to face interview. Patients were considered to be non-compliant when they had missed more than 7 consecutive days of treatment.

Results: About half (48%) of non-compliant were more likely to think that treatment could be stopped once they were free of symptoms and thought they were cured. Adherence proportion was high among the higher education group ($p<0.05$). The overall knowledge scores ($p<0.001$) were statistically significant difference between the compliant and non-compliant patients. A significant relationship was found between compliance behavior and availability of health workers at DOTS centre ($p<0.05$), DOT ($p<0.001$), mode of transportation, and traveling time ($p<0.001$).

Conclusion: Adherence is affected by educational level, knowledge, availability of health workers, directly observed treatment, and traveling time. It could be improved by provision of more information about tuberculosis and expansion of DOTS near to the patient's home.

Keywords : Tuberculosis, DOTS, Compliance, Kailali, Nepal.

Introduction

Tuberculosis (TB) is one of the major public health problems. World Health Organization (WHO) and International Union Against TB and Lung Disease (IUATLD) recommend use of the Directly Observed Treatment Short-course (DOTS) strategy to avoid incomplete treatment and multidrug resistance (resistance to at least isoniazid and rifampicin) TB.[1,2]

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Directly Observed Treatment (DOT) is one of the key components of this strategy. DOT is, the patient should be directly observed as he or she swallows each dose of anti-TB treatment for at least the first two months of treatment by a trained person. It is estimated that six out of 10 adults in Nepal are infected with TB.[3] About 5000-7000 people die from TB each year.[4] In 2004, the tuberculosis (TB) case notification rate was 131 per 100,000 population.[4]

In 1995, the government of Nepal developed a 5-year development for the revised National Tuberculosis Programme (NTP) based on DOTS strategy. Four urban and suburban pilot sites were selected for the implementation of health facility based DOTS and it was introduced in April 1996.[5] Treatment regimens

consists of 2 months health worker observed treatment, followed by 6 months treatment collected weekly from health facilities (2HRZE/6HE).[5]

Kailali was one of pilot sites for DOTS implementation in 1996. This site introduced a strict policy of health facility based DOTS and had thorough monitoring and supervision from district and central NTP staff. This is one of the high TB cases districts, has an estimated annual risk of TB infection (ARTI) of 2%.[4] It accounted about 2.9% of the national TB cases with notification rate 144/100,000 population in 2003/2004.[4] Tuberculosis patients are treated using a combination of four drugs, administered by directly observed therapy at a clinic daily in intensive phase and weekly supply during the continuation phase.[5] Patients are considered to be non-compliant when they have missed more than 7 consecutive days of treatment. If patients are identified as non-compliant, the members of the local DOTS committee visit their home to trace them. If patients subsequently fail to attend they are revisited.[6] Approximately 7% of patients became defaulter and 85% of the patients were successfully treated in 2003/2004.[4]

Defaulting from treatment results in persistent transmission of the tubercle bacilli within the community, increased morbidity and cost to TB control programmes.[7] It can also lead to relapse and drug-resistant TB, and is said to be one factor responsible for the persistence and resurgence of TB.[8]

Studies in India[9], Swaziland[10], South Africa[11], and Zambia[12] indicate that poor knowledge about the length of treatment accounts for default. Patients' defaulting behavior occurs when their symptoms of TB disappear and they feel well after few months of TB treatment. A study in Ethiopia found that default is higher among patients who need travel longer distances to health centre and pay for consultation.[13] There is no previous studies in this district that examined factors affecting patients' compliance with DOTS therapy. We thus conducted this study with the objectives: to identify TB patients' socioeconomic, knowledge, and accessibility factors with DOTS.

Material and Methods

Study design : A cross sectional study was carried out between December 2004 and March 2005 among tuberculosis patients were being treated under DOTS therapy.

Sample size calculation : At the time of this study there were 8 DOTS centres functioning as per the NTP policies in Kailali district. Fifty percent of the DOTS centres were randomly selected. All the patients registered between January and March 2005 had been interviewed. Patients were categorized as compliant and non-compliant by reviewing treatment cards and tuberculosis register kept in DOTS treatment centres.

The sample size for this study was calculated using EPI-INFO version 6.04 (a statistical program for epidemiology and microcomputers Atlanta, GA: Centres for Disease Control and Prevention, 1995), taking a precision 5%, 80% treatment success rate with DOTS and confidence level 95%.

Questionnaire administration : A standard questionnaire was prepared in English and translated into Nepali. All data were collected by use of a pre-tested questionnaire. Direct interviews with trained interviewers were carried out between December 2004 and March 2005 among 130 compliant and 25 non-compliant patients. Verbal consent was obtained and confidentiality was maintained throughout the study.

The questionnaire consisted socio-demographic characteristics (age, sex, marital status, educational status, and occupation), knowledge (sign and symptoms of TB, cause of TB, transmission of TB, method of diagnosis, duration of TB treatment, and benefit of DOTS), availability of health services (DOT provider, health education, directly observed treatment), and accessibility to DOTS clinic (distance, traveling time, waiting time, travel cost and mode of transportation).

Statistical analysis : Data from questionnaire were checked before data entry. Descriptive statistics were used to examine the subjects' characteristics. For the comparison between compliant and non-compliant, the chi-squared test was used to compare proportions, and the Student t-test was used to compare means. Summation scores for patients' knowledge were calculated. Knowledge of tuberculosis and its treatment were assessed by eight questions. One point was awarded for each correct answer, to a maximum score of eight. Data was analyzed using SPSS version 10 (SPSS for Windows, SPSS Inc. Chicago, IL, USA) systems.

Results

Socio-Demographic factors : A total of 155 interviews were conducted in the study: with 130 patients in the compliant group and 25 in the non-compliant group. The mean (standard deviation) age of the patients in the study sample was 35.9 (14.5) years. The largest age groups were those between 15 and 34. Non-compliant were found higher (44%) between this age group. However, we failed to demonstrate statistically significant difference. The non-compliant sample was 56% were male, 92% were married, 44% were farmer, and 72% were illiterate. Table 1 compares the demographic characteristics on the compliant and non-compliant; significant difference was noted in the level of education (p=0.019) only.

Table 1 Number and percentage of compliance by socio-demographic characteristics

Characteristics	Compliant (n = 130)	Non-Compliant (n = 25)
	n (%)	n (%)
Age group		
15-34	67 (51.6)	11 (44.0)*
35-54	47 (36.1)	9 (36.0)
>54	16 (12.3)	5 (20.0)
Mean=35.9,SD=14.5, min.=15, max.=78		
Sex		
Male	84 (64.6)	14 (56.0)*
Female	46 (35.3)	11 (44.0)
Marital status		
Single	22 (16.9)	2 (8.0)*
Married	108 (83.1)	23 (92.0)
Occupation		
Farmer	53 (40.8)	11 (44.0)*
Daily wage laborer	9 (6.9)	4 (16.0)
Housewife	30 (23.1)	7 (28.0)
Government service	2 (1.5)	0 (0.0)
Private service	11 (8.5)	2 (8.0)
Own business	13(10.0)	0 (0.0)
Others	12 (9.2)	1 (4.0)
Educational status		
Illiterate	52 (40.0)	18 (72.0)**
Primary	33 (25.3)	5 (20.0)
Secondary	28 (21.5)	1 (4.0)
Higher	17 (13.1)	1 (4.0)

*P>0.05, ** P<0.05

Knowledge about disease and treatment

Table 2 summarizes the responses of the study participants about knowledge of TB and its treatment. The mean (SD) knowledge score for the compliant sample was 5.65 (1.48) and for non-compliant sample it was 4.36 (1.47). The mean knowledge score of the compliant group (70.63%) was 16.13% higher than non-compliant group (54.5%). The difference between the samples was statistically significant (p<0.001). Very few compliant (37.7%) and even fewer of the non-compliant (20%) were aware of the causative agent of TB. Coughing for two weeks or more was the most commonly cited symptom of TB for both compliant (80.8%) and non-compliant (80%) patients. Compliant patients (71.5%) stated that TB is spread by droplets while this was cited by 56% of non-compliant patients. Majority (86.2%) of the compliant patients agreed that "treatment can be stopped after declaring cured by health workers after final sputum examination" whereas this rate was only 16% of the non-compliant patients.

Table 2 Number and percentage of respondents classified by correct answers related to knowledge about disease and treatment

Knowledge statement	Correct answer	
	Compliant No. (%)	Non-Compliant No. (%)
	N=130	N=25
The cause of TB is bacteria	49 (37.7)	5 (20.0)
The most important symptom of TB is coughing for two weeks or more	105 (80.8)	20 (80.0)
The main source of transmission of TB is droplet through air	93 (71.5)	14 (56.0)
TB is diagnosed with sputum examination	105 (80.8)	16 (64.0)
The most important benefit of DOTS is DOTS completely cures the TB disease	110 (84.6)	20 (80.0)
The major side effect of TB drugs is jaundice	33 (25.4)	7 (28.0)
Duration of full course of treatment is 8 months	128 (98.5)	23 (92.0)
Treatment can be stopped after declaring cured by health workers after final sputum examination	112 (86.2)	4 (16.0)
(Score out of 8) Mean ± SD	5.65±1.48	4.36±1.47

Reasons for non-compliance (table 3)
Of the non- compliant patients, 48% thought they were cured, 28% reported inconvenient opening time of DOTS clinic, and 16% said they did not know the length of treatment with DOTS.

Availability of health care services (table 4)
Almost similar proportion of compliant and non-compliant patients was likely to be received health education in their every visit to DOTS centre. Significant relationship was found between compliance and availability of DOT provider to every visit of DOTS clinic (p=0.017). Of the non-compliant patients, only 60% were received directly observed treatment at their every visit to DOTS clinic compared with 90% of the compliant patients. Statistically significant association were observed between compliance and availability of DOT at DOTS clinic (p<0.001).

Accessibility to health care facilities (table 5)
Distance to the clinic for patients ranged from 1 to 12 km with a median of 2 km. No statistically significant differences were detected between distance and compliance with DOTS (p=061). The mean commuting time to the DOTS clinic was 25.3±19.8 minutes (range 0 to 120 minutes). Majority (80%) of the non-compliant patients were more likely to have longer traveling time (>30 minutes).

Table 3 Reasons for non-compliance with DOTS

Reason for not complying	Number (n=25)
Cannot afford travel cost	1 (4%)
Side effects of TB drugs	1 (4%)
Don't know treatment duration	4 (16%)
Thought cured	12 (48%)
Inconvenient opening time	7 (28%)

Statistically significant differences were found between traveling time and compliance with DOTS. Most of the non-compliant (76%) went to the DOTS clinic on foot compared with 47.7% of the compliant patients. Mode of transportation and compliance with DOTS differed significantly between compliant and non-compliant participants (p=0.012).

Discussion

TB control programs currently emphasize the DOTS strategy, promoted by World Health Organization (WHO) and International Union Against Tuberculosis and Lung Disease (IUATLD). Direct observation and supervision of patients is assumed to be more effective than self-administration to ensure that patients successfully complete the recommended six-to-nine month chemotherapy. Success in TB detection and treatment requires specific behaviors from patients and health care providers within contexts that facilitate those practices. Promoting adherence by directly observed treatment is mush more important than expanding resources on defaulter tracing which is difficult and often unproductive, especially in low income countries.[14]

The present study illustrated that the major factors influencing compliance behavior with DOTS in the Kailali district are educational status, knowledge about TB and its treatment, availability of DOT provider and DOT at every visit to the DOTS clinic, mode of transportation, and traveling time to DOTS clinic. The significant influence of education is consistent with results from Thailand.[15] It is likely that less educated patients will have higher non-compliance behavior with DOTS strategy. In addition, education is closely associated with knowledge of TB and its treatment pattern.

Table 4 Relationship between availability of services and patient compliance with DOTS

Characteristics	Compliant (n = 130)	Non-Compliant (n = 25)
	n (%)	n (%)
Availability of health education in every visit in DOTS centre		
Yes	126 (97)	23 (92)*
No	4(3)	2 (8)
Availability of health worker to every visit at DOTS centre		
Yes	125 (96)	21(84)**
No	5 (4)	4 (16)
Availability of directly observed treatment		
Yes	117 (90)	15 (60)#
No	13 (10)	10 (40)

* p>0.05, **p<0.05, #p<0.001

The present study found that non-compliant TB patients had limited understanding and knowledge about TB, and its treatment, with a mean knowledge score of

only 54.5%. Knowledge was significantly poorer among non-compliant than compliant groups which is consistent with Malaysian findings.[16] Poor compliance was encountered among Malaysian patients who had misconceptions and limited knowledge about the disease and its treatment. Studies in Vietnam[17] and Malawi[18] explored insufficient knowledge about the disease and duration of treatment was the main obstacles to compliance. Most of the non-compliant patients (84%) interrupted treatment soon after they felt better and/or around two months after initiating chemotherapy observed in the present study. It is also noted that patients became non-compliant because they thought they were cured. Findings from India[19] suggest that patients' misconception of well-being with cure leads to default. Also, patients who did not know about potential side effects of medicines were more likely to default. Similar findings were observed in the studies of Bam TS et al.[20], O'Boyle et al.[21] and White MC et al.[22] which showed that compliant patients were well-informed about the need to continue treatment. This indicates that compliance improves notably if health education session is available at DOTS clinic.

Another important finding in our study is that the availability of DOT provider and the quality of healthcare provider-patient interaction accounts for differences in treatment adherence. Study in South Africa[11] has reported that the quality of the health practitioner-patient communication coupled with correct causative belief were strongly associated with compliance behavior. External constraints are also predictors of adherence. The present study presented that non-adherence is higher among patients who need longer traveling time to DOTS clinic.

Table 5 Relationship between accessibility to health care facilities and patient compliance with DOTS

Characteristics	Compliant (n = 130)	Non-Compliant (n = 25)
	n (%)	n (%)
Mode of transportation		
On foot	62 (47.7)	19 (76.0)**
Own vehicle	46 (35.4)	3 (12.0)
Ricshaw	13 (10.0)	2 (8.0)
Bus	9 (6.9)	1 (4.0)
Distance (kilometer)		
d"2	45 (34.6)	3 (12.0)*
2-4	62 (47.7)	14 (56.0)
>4	23 (17.7)	8 (32.0)
Median = 2.0,Q1=1.0,Q3=4.0 min.=1,max.=12		
Traveling time (minutes)		
0-10	47 (36.2)	2 (8.0)#
10-30	41(31.5)	3 (12.0)
>30	42 (32.3)	20 (80.0)
Mean=25.3,SD=19.8; min.=0.0,max.=120		

**p>0.05, **p<0.05, #p<0.001*

This study also illustrated that patients may default on treatment because of inconvenient opening hours of DOTS clinic situated far from their homes. Very similar results are highlighted in the study of Ethiopia[13], Thailand[15], and India[9], indicating that hard to reach to health centre and inconvenient opening time of the centre account for defaulting treatment.

The study has certain limitations. Validity was compromised because non-compliant was considered as patient who had interrupted more than a week consecutive treatment under DOTS strategy. There was potential selection bias from the selection of study DOTS treatment centres. Both compliant and non-compliant patients were various stages of treatment. As a result, recall bias might have happened.

Conclusion

It is worth mentioning here that this study was not resource concentrated and was accomplished in a short time frame. Such efforts may be useful to programme mangers and policy makers in that they may give further insight into identifying problems that are not highlighted by regularly collected data. One of the basics of TB control is to enhance patient adherence, which is a multifaceted issue involving an array of barriers, some of which have been noted in this study. Enhancing treatment adherence is serious issue for TB control programmes, particularly in the Terai (plain areas) districts of Nepal, where a large proportion of tuberculosis patients are diagnosed and treated. In the study district, patients' educational level, awareness to disease and DOTS strategy, and accessibility to DOTS clinic were found closely linked to improving compliance with DOTS.

Targeting the TB services to make it more acceptable and accessible to users, such as offering of different 'DOT' options, or expanding TB service near to the patients' home would be considered in improving adherence. Counseling and organizing health education sessions at the DOTS clinic enhances the patient's motivation and knowledge towards DOTS therapy to complete full course of TB treatment.

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TUBERCULOSIS AWARENESS AMONG TB PATIENTS VISITING IN DOTS CLINIC IN PATAN HOSPITAL

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Abstract

This cross sectional survey was conducted to determine awareness about TB among the tuberculosis patients (total 58) visiting in DOTS clinic of Patan Hospital between the period June 18/2003 to July 20, 2003 .This study revealed that out of total 31 cases, 80.65% were found in productive middle age groups (15-49 years). In addition, we found that 84.48% were familiar about TB disease but more than fifty percent were unaware of DOTS program. Regarding treatment, 55.17% patients had an idea about medical treatment. Further 24.14% were smokers before disease diagnosis and they smoked between one to twenty cigarettes per day. Smoking is considered to be one of predisposing risk factor for pulmonary tuberculosis. Out of total 14 smokers, 64.29% had pulmonary tuberculosis (both positive as well negative).In relation to occupation, 36.21% patients were students, 29.31% were workers (including weaver, tailor, painter, carpenter cobbler etc., 6.90% were farmers and 8.62% were job holders (nurse, teachers, army, security guard etc) and remaining (18.96%) were jobless . More than half of the patients were in low economic level. Interestingly our study showed highly significance between sex and smoking behavior.

Key words: *AFB, Pulmonary tuberculosis, DOTS.*

Introduction

Tuberculosis (TB) remains a major global public health problem particularly in developing and underdeveloped countries. Globally, it is responsible for more than three million deaths each year (World Health Organization [WHO], 2004). The risk of tuberculosis is greater in areas of residence characterized by crowding, poverty, lower education, HIV/AIDS etc. (Lifson *et al*., 1999). In case of Nepal also, it remained one of the major health problems. According to National TB Center's Newsletter (2001), there are over 80,000 people having tuberculosis. About 50,000 people develop tuberculosis and 10,000 people die from this every year (nearly 200 deaths every week and over 25 deaths every day). Nearly 22,000 have infectious sputum positive tuberculosis in the same period. It is the commonest cause of death in adult aged 15 to 49, this being economically productive age group (Harries *et al.,* 1998).

TB is usually caused by the *Mycobacterium tuberculosis* and occasionally by *Mycobacterium bovis and Mycobacterium africanum.* It is primarily a disease of the lung (80%) - termed as pulmonary tuberculosis (PTB) and spread by the inhalation of infected droplet nuclei or by coming into direct contact with an infected person. Prime symptoms in the case of PTB are: cough for more than 3 weeks with or without blood, fever, night sweats, loss of appetite, weight loss, chills, pain in chest etc. PTB can be diagnosed by sputum examination (smear and culture) tuberculin test, chest X-ray etc. Direct Observed Treatment Short course (DOTS) is a short course of chemotherapy used to cure the tuberculosis patients. It is given to them under the direct supervision of the health workers that involves at least a six-month (6-8) antibiotic regimen. This strategy is said to cure more than 90% of new smear positive patients and reduces

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spread of infection by breaking the chain of the transmission (WHO, 1999). Countries around the world began applying DOTS in the early 1990s (WHO, 2004). However it was introduced in Nepal in April 1996 only. In July 2003, 94% of population was covered by DOTS with 324 treatment centers and 1154 sub centers with more than 85% treatment success rate (Bam, 2002).

On this background, this study is designed to determine awareness about TB among the TB patients visiting in DOTS clinic of Patan hospital between the period of June 18/2003 to July 20, 2003. The total number of sample used was 58. The study revealed that out of total 31 cases, 80.65% found in productive middle age groups (15-49 years) and 84.48% were familiar about TB disease but more than fifty percent were unaware of DOTS program. Regarding treatment, maximum 55.17% patients had an idea about medical treatment. Further, 24.14% were smokers before disease diagnosis and they smoked between one to twenty cigarettes per day. Out of total 14 smokers, 64.29% had pulmonary tuberculosis (both positive as well negative).

Materials and Methods

The objective of the study was to determine awareness about TB among TB patients. For this purpose we focused primarily on interviewing of TB patients using structural questionnaires visiting at DOTS clinic of Patan hospital, locataed at Lalitpur which is five Km south east of Kathmandu the capital of Nepal from June 18, 2003 to July 20, 2003. The rationale of using Patan Hospital as study area is because of it being largest and oldest hospital of Lalitpur (Lalitpur lies at five kilometer south east of Kathmandu, the capital of the Nepal). The awareness related to smoking habits, knowledge about tuberculosis, behaviour of family members and other people toward patients. We also used Chi squire test to determine whether there is any relationship between the sex and smoking habit. The total sample used was 58.

Results

This section presents the result of the study under the sub-heading general information and survey of TB patients.

General Information

Table 1 presents the general information on total 58 TB patients visiting DOTS clinic in the hospital from June 18/2003 to July 20, 2003 , out of total 58 patients. 36 (62.07%) were male and 22 (37.93%) were female 31 (53.45%) were smear positive. 49 (84.48%) live in Lalitpur district out of which 23 (39.83%) were local residents and 79.31% were literataed (table 1). Only 24 (41.38%) patients had knowledge about DOTS .When categorized by the profession, the study showed that 21 (36.21%) were students, 17 (29.31%) are workers (including weaver, tailor, painter, carpenter, cobbler etc.), 4 (6.90%) are farmers, 5 (8.62%) are job holders (nurse, teachers, carpenter, cobbler etc) and remaining (18.96%) are jobless (not shown in Table 1).

Table 1 General Information of TB patients

Category (Total no. of Respondents =58)								
Sex		Smear		Literacy rate	Resident		About DOTS	
Male	Female	Positive	Negative		Permanent	Temporary	Known	Unknown
36 (62.07%)	22 (37.93%)	31 (53.45%)	27 (56.55%)	79.31%	49 (84.48%)	9 (15.52%)	24 (41.38%)	44 (58.62%)

Out of 58 patients, 40 had pulmonary TB (PTB) and the remaining 18 had Extra pulmonary (EPT). Further out of 40 PTB patients 31 had AFB positive. Age wise distribution of AFB + PTB showed that 80.65% were in middle age group (15-49), 16.13% were in higher are group (above 49 years age and 3.23% were in lower age group (below 15 years age (table 2)

Table 2 Age - wise distribution of AFB Positive PTB Patients.

S. No.	Age Group	No. of AFB Positive Patients	Percentage %
1	Below 15	1	3.23
2	15 - 49	25	80.65
3	Above 49	5	16.13
	Total	31	100

2. Survey Result of TB Patients

This sub-section sepicts the view about TB regarding symptoms, mode of transmission, treatment, type, control and relationship with smoking habit.

2.1 Patient's View about Regarding Symptoms of TB

Out of total 58 TB patients, 49 (84.48%) patients have knowledge about tuberculosis but only 9 (15.52%) had only little knowledge (not shown in Table 3). The symptoms of TB (Table 3) as stated by the respondents giving positive response, were breathlessness 2 (4.08%), coughing 12 (25.49%), fever 5 (10.20%), coughing and breathlessness 5 (10.20%), coughing and fever 13 (27.53%), all above symptoms 12 (24.49%) Table 3.

2.2 Patients view about transmission of TB

Out of total 58 patients 44 (75.86%) said that TB is an infectious disease (not shown in Table 4).

Their views regarding the transmission of TB are depicted in the Table 4.

Table 3 TB Patient's View about Regarding Symptoms of TB

Category	Positive Response	Percentage (%)
Breathlessness (B)	2	4.08
Coughing (C)	12	25.49
Fever (F)	5	10.20
Coughing and Breathlessness (C & B)	5	10.20
Coughing & Fever (C & F)	13	27.53
All	12	24.49

Table 4 TB Patient's View about Transmission of TB

Category	Positive Response	Percentage (%)
Blood	1	2.27
Contact	2	4.55
Coughing	32	72.73
Coughing & Blood	2	4.55
Coughing & Contact	7	15.91

2.3. Patients view about treatment of TB

The behavior towards TB patients by other persons play very important role in reducing TB transmission to family member and neighbors. It also aids in the proper treatment of patients. The survey showed that most of patients (67.24%) felt the need of extra care, 20.69% patients looked for normal attention and 12.07% were unaware of it. When asked about the type of treatment they were undergoing, 55.17% of the total patients had an idea of medical follow up, 3.45% said it was related to witchcraft and remaining 41.38% said that they had no idea of treatment method they were following.

2.4 Patients view about types and control of TB

With regard to knowledge about different types of TB, 5.17% had knowledge about bone TB, 32.76 % had information about PTB, 25.86 % had knowledge

about bone TB and PTB, 3.45 % had knowledge about PTB and renal TB, 5.17 % were familiar to all of above and 27.59 % were unknown to any of the above forms of TB. Regarding the control of TB, 60.34% patients knew that TB can be controlled by various preventive methods while the others were unaware of it. Similarly, 63.79% patients had an idea about prevention.

2.5 TB patients and Smoking Behavior

The study revealed that 44 (75.86%) were non-smokers and 14 (24.14%) were smokers. Out of total 14 smokers, 8 (57.14%) smoked less than 5 cigarettes/day, 4 (28.57%) smoked between 5-10 cigarettes/day and 2 (50%) smoked from 10-20 cigarettes/day and 2 (50%) smoked from 10 to 20 cigarettes/day (Table 5). Among total smokers, 12 (85.71%) were males and 2 (14.29%) were females (Table 6).

Table 5 No. of Cigarettes smoked by TB Smokers per day (N=14)

S.No.	Category	Positive Response	Percentage (%)
1	<5/day	8	57.14
2	5-10/day	4	28.57
3	10-20/day	2	14.29

Table 6 Sex and Smoking Habits of TB patients

S.No.	Sex	Smokers	Non-Smokers	Total
1	Male	12	24	36
2	Female	2	20	22
3	Total	14	44	58

Discussion

Our study interviewed 58 TB patents whose age ranged from 9 to 74 years with the mean age of 32.3 (mean age not shown in result section). Thirty six patients were males and 22 patients were females. More than half of patients (32) were married. Forty four patients were non-smokers and 14 were smokers. Forty nine patients had knowledge of TB as a disease; while 9 had no knowledge. Regarding transmission, fourteen patients had no idea about transmission. Twenty eight patients viewed not sleeping at common place (in regard to control) whereas 32 viewed to cover their mouth while coughing. Only 41.38% had knowledge about DOTS program. Similar study conducted by Dr. Rehan Azeem (2002) on management of pulmonary tuberculosis in the health sectors of Pakistan interviewed thirty TB patients, age ranging from 9 to 67 years. Among them, sixteen are men and fourteen are women and half of the patients are married. Nineteen patients are non-smokers and 8 are smokers. Eleven patients have no knowledge about TB, while 14 have low knowledge and remaining has good knowledge about TB. Fourteen patients have no idea about transmission. In regard to control, ten patients told to avoid contact with friends, family and children whereas 4 patients told to cover their mouth while coughing and 4 told to have separate towels and utensils. Hence with regard to knowledge of tuberculosis and habitual practices present study results among DOT's patients revealed more or less similar with the study conducted in Pakistan. This indicates the present of common socio-cultural practices between peoples of Nepal and Pakistan.

In this study, among AFB + PTB cases maximum infection was found among productive age group (15-49) i.e. 80.65% and only 3.23% were below 15 years, Hornick (1993), WHO (1998) and Kochi (1994) also report similar results.

The study found that 14 (28.14%) were smokers and 44 (75.86%) were non smokers among 58. Out of the total 14 smokers, 57.14% of smokers smoked less

than 5 cigarettes per day 28.57% smoking between 5-10 cigarettes per day and 14.29% smoking between 10-20 cigarettes per day. In an identical study carried out by Jha *et al*. (1999) in Sunsari district of Nepal among the 8643 randomly selected participants found 17.5% smokers. Out of total smokers 11% smokers smoked more than 20 cigarettes per day and 42% are smoking from more than 20 years.

Regarding smoking habit, our study showed that 12 smokers were male and 2 were females. According to the significance test, smoking habit in males and females was found to be statistically significant. Similarly study done by Karki (1993) shows that among 203 smokers, 163 (80.30%) were males and 40 (19.70%) were females. However he didn't show the results of significance between smoking habit and sex.

The study obtained that among the total of 58 patients, 14 (24.14%) were smokers and 44 patients (75.86%) were non-smokers. Out of total 14 smokers, 9 (64.29%) patients had pulmonary tuberculosis (6 patients had positive AFB and 3 had –ve) and out of 44 non-smokers, only 9 (20.45%) had pulmonary tuberculosis. Similar study by Subedi (1985) on tobacco smoking and its effects on lung among the 1336 patients attending in chest department of Tri-Chandra Military Hospital showed that 885 patients (66.24%) are smokers and 451 patients (33.75%) are non-smokers. Among total of 885 smokers, 431(48.7%) have pulmonary tuberculosis and out of 451 non-smokers, 168 (37.25%) have bad pulmonary tuberculosis.

Our study showed that 40 (68.97%) had pulmonary TB of whom, 32 had sputum positive disease (new relapse cases). The study further showed that 32 (72.73%) knew about the inhalation being a mode of transmission. 49 (84.48%) were aware of the TB symptoms and 13 (27.53%) identified cough and fever as the symptoms of disease. Fifty (86.21%) knew that drug could provide the cure. Thirty two (72.84%) recognized that TB could be transmitted during coughing .Thirty nine (67.24%) were aware about prevention from TB. In a similar study by Arora. *et al.* **(**2003) on community mediated domiciliary DOTS execution at L.R.S Institute of Tuberculosis and Respiratory Diseases in New from February 2001 and August 2002 showed that out of 52 TB patients they interviewed thirty (58%) have EPT. The remaining 22 (42%) have pulmonary TB, of whom, 11 have sputum positive disease (all being new cases). They also found that 15 (29%) are aware about the inhalation being a mode of transmission, 47 (90%) are aware of the TB cause. In addition 50 (96%) know that medication can provide the cure and 42 (81%) know that disease can be transmitted during coughing. and 8 (19%) had idea about preventions.

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PRESENTATION OF PULMONARY TUBERCULOSIS IN CANNABIS OR/AND OPIATES DRUG ABUSERS

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Abstract

Objectives: 1.To determine and document the clinical and radiological presentations, susceptibility and resistance pattern in new culture positive pulmonary TB patients who smoked either cannabis or opiates or both.
2. To compare the difference (s), if any, between abusers (opiates or/and cannabis) and non abusers PTB patients.

Methodology: This was a comparative hospital based study conducted from January 1999 to December 2000 among new culture positive PTB patients who either smoked cannabis or opiates or both and who never abused drugs. Patients were recruited from two major health facilities- the Department of Chest Medicine, Jinnah Postgraduate Medical Center Karachi and Ojha Institute of Chest Diseases Karachi. Fifty-five new PTB patients with drug abuse and 108 new PTB patients without drug abuse were selected. The data was collected prospectively; all patients were interviewed, examined and investigated once. The data was analyzed with the help of Epi Info and SPSS soft ware programs. To avoid the gender and smoking habit bias among both study groups, subgroups of male patients nearly of same age and smoking habits were selected and their data was compared.

Results: Almost all of the PTB patients with drug abuse were males (54/55)**.** Dyspnoea was the presenting symptom in significantly greater proportion of the PTB patients who smoked drugs than those who never abused drugs (43.6% vs. 7.4%) (OR=9.68, CI 3.69, 27.11, $p < 0.01$). Mean durations of most of the symptoms were significantly longer ($p < 0.05$) in drug abuser PTB patients than those in non abusers. More than seventy percent of PTB patients abusing drugs presented with bilateral extensive lesion on chest X-ray PA view ($p < 0.05$). Three percent of PTB patients abusing drugs presented with primary MDR TB ($p > 0.05$).

Conclusion: It is concluded that new PTB patients with drug abuse differ in clinical and radiological presentations from those who never abused drugs. Majority presented with symptoms of longer duration, had bilateral extensive lesion on chest x-ray. Primary MDR TB does not appear to be a major problem in this group of patients.

Key words: Pulmonary TB, Drug Abuse, Pakistan

Introduction

Tuberculosis has remained a significant global public health problem for many decades.[1] Currently it is an enormous global health issue.[2] The prevalence of TB infection is high among drug abusers and they are at high risk of developing active TB. The contributors to the frequency of latent and active TB in drug abusers are the demographic and socioeconomic characteristics of drug -abusing populations and the co- existence of drug abuse and other risk factors for TB.[3]

Pakistan is a developing country with population of 130.6 million.[4] It bears nearly half of the TB burden of Eastern Mediterranean Region (EMR) and is ranked fifth among the 22 highest incidence countries in 1997.[5]

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The estimated prevalence of MTB infection reported recently by WHO is 40% in general population[5] but it was reported to be 54.4% in survey carried out in 1974-78.[6,7] It is estimated that nearly 1.5 million people are affected by TB currently and more than 261,000 new cases occur every year at rate of 181/ 100,000 population.[8] More than 45% among them are infectious (smear positive). Drug resistant and multi drug resistance (MDR) TB is on rise but there is no adequate data available on primary drug resistance.

Globally drug abuse is also one of the major public health and social problems.[9] Poly drug abuse is more common than single drug abuse.[10] In Pakistan it is an ever-increasing problem.[11, 12] According to United Nation's 1986 survey 2.06 million persons were abusing drugs in Pakistan. The projected increase in drug abuser's population was estimated at 10% per year.[11, 12, 13] A survey carried out in 1988 reported 1.08 million heroin addicts and 0.72 million charas addicts in Pakistan.[11] The 1999's estimated figures of drug addict population in Pakistan was close to 4 million, growing at the rate of 7 percent per year. Among them 2,131 thousands (nearly half) were heroin addict and 1,222 thousands were cannabis addict (about 30%).[11, 12, 13]

People who abuse drugs suffer from many medical problems in addition to their addiction.[14] They often present in clinics and hospitals because of their complications (mainly medical, may be surgical) and psychiatric problems.[15, 16, 17] The medical complications include septic/infectious, cardiovascular, hepatic, pulmonary, neurological, maternal and neonatal complications, and malnutrition. The infectious complications include skin infections, hepatitis, aspiration pneumonia and its complications like lung abscess, empyema brain abscess, tuberculosis, pulmonary septic emboli and septicemia, sexually transmitted infections, AIDS, infective endocarditis, tetanus, malaria, melloidosis, osteomyelitis and septic arthritis.[18, 19]

Drug abuse makes the person immunocompromised. Laboratory studies demonstrated the immunosuppressive role of alcohol, opiates, cannabis, cocaine and tobacco smoking.[20, 21, 22, 23]

Illicit drug smoking has been associated with an increased risk of a variety of respiratory tract infections both through direct transmission of organisms and indirect effects of drug.[24] Drug abuse is one of the possible risk factors for TB.[25] The exact global burden of TB in drug-abused population is not known but figures are reported to be high from different parts of the world. An incidence rate of TB in drug abused population in New York City in 1996 was reported to be 744 case per 100,000 person years, a 14.8 times more than that of age matched general population.[26] The prevalence rate of TB in drug addicts in 1998 in Shiraz Iran was 2500 per 100,000 drug addicts.[27] The incidence of TB in HIV negative drug abusers is still six times higher than in the over all Amsterdam population reported by Keizer ST et al in year 2000.[28] The incidence rate of TB among the HIV sero-negative intravenous drug abusers in San Francisco in 1998 was reported to be 0.4 per 100 person years.[17] The substance abuse may account for additional deaths as reported by White MC et al.[29] Data regarding the prevalence of PTB in cannabis and opiates smokers in Pakistan is not documented.

Drug abusers are at increased risk of contracting TB infection and developing active TB disease. This association has been noted in injection as well as non-injection drug abusers even before the appearance of HIV.[13, 25] The clinical and radiological presentation of PTB in this high-risk group of population could differ. Injection drug abuse is one of the factors most highly associated with primary drug resistance. Drug abuse is one of the possible causes of poor compliance to anti-TB drugs and hence of acquired drug resistance. It is also one of the possible causes of relapse of TB disease.[30]

The multiple drug abuse is more common than the single drug abuse and various stage patterns of drug addiction are described in the literature.[31, 32, 33] The usual stage pattern of acquiring addiction of cannabis and opiates in Pakistan is that: the people usually start smoking tobacco first in the form of cigarette, then acquire the habit of smoking charas or opium mixed with tobacco in the form of cigarette and several of them start smoking heroin or acquire addiction of other drugs or alcohol in addition.[34]

The most common route of abusing opiates (opium and heroin) and cannabis (charas) in Pakistan is by inhalation through smoking.[34] These persons usually smoke drugs in groups hence the chances of transmission of infection are high. For this high-risk group, screening, prevention of infection, diagnosis

and treatment of the disease pose particular challenges.

Drug abuse in Pakistan is highly prevalent and all demographic and socioeconomic conditions are favorable for development of TB infection and disease.[34] There is lack of data on tuberculosis among drug abusers. Understanding the presentation can help the clinician in proper management and control of disease in this difficult to access group of population. It is also imperative to understand how this group of patients differs from non-drug abusers suffering from PTB.

2. Methodology

2.1. Study Setting

This is a hospital-based study conducted at two major institutions, the Department of Chest Medicine, Jinnah Postgraduate Medical Center and Ojha Institute of Chest Diseases Karachi Sindh Pakistan

2.2. Study Design

This study comprises of two groups of patients recruited serially. Each patient was interviewed on a single occasion (in one setting). Required investigations were done once only.

Group A. It comprises of new culture positive pulmonary tuberculosis patients who had smoked cannabis or opiates or both.

***Note* :** *The usual sequence of acquiring addiction of these drugs (cannabis & opiates) is that the people usually start smoking tobacco first in the form of cigarette, then acquire the habit of smoking charas or opium with tobacco in the form of cigarette and finally several of them start smoking heroin or acquire addiction of other drugs or alcohol in addition.*

Group B. It comprises of new culture positive pulmonary tuberculosis patients who never abused any drug.

Note : *From here onwards group A or pulmonary tuberculosis (PTB) patients with drug abuse and group B or pulmonary tuberculosis (PTB) patients without drug abuse will be used interchangeably.*

Subgroups : To avoid the gender and smoking habit bias among study population, two subgroups of male patients, nearly of same age and smoking habits were selected and named as group A-I and B-I.

Group A-I: Male smoker new PTB patients with drug abuse.

Group B-I: Male smoker new PTB patients without drug abuse.

2.3. Study Population

The study persons were new[1] culture positive pulmonary tuberculosis patients. In this study those patients were selected who had never taken ATT before.

2.3 a. Inclusion Criteria

Group A

New culture positive PTB patients age 18 years and above who smoked cannabis or opiates or both for not less than one year at the time of presentation.

Group B

New culture positive PTB patients age 18 years and above who never abused any drug during their lifetime.

2.3 b. Exclusion Criteria

Both groups (A & B)

Following were the exclusion criteria for both groups-group A and B:

1. Patients with history of intravenous drug abuse and alcoholism,
2. Patient with history of diabetes mellitus,
3. Female patients with history of pregnancy, and
4. Patients with history of lymphoma, leukemia or any other malignancy,

2.3 c. Source

For group A, patients were recruited from the Department of Thoracic Medicine, Jinnah Postgraduate Medical Center (JPMC) Karachi and Ojha Institute of Chest Diseases (OICD) Karachi. For

[1] New TB patient is one who has never taken anti TB treatment (ATT) or taken ATT for less than one month.

group B, all patients were recruited from the Department of Thoracic Medicine, Jinnah Postgraduate Medical Center (JPMC) Karachi.

2.4 Study Period

Study persons for both the groups were recruited during two years time from January 1999 to December 2000.

2.5 Sample Size

Sample size was calculated on the basis of clinical features, radiographic presentation and microbiology related features found in PTB patients.

1. Clinical feature detection

To identify the clinical features in this study, haemoptysis among PTB patients seemed to be the least prevalent (21%) feature.[35] By using the prevalence (P = 0.21) of this clinical feature among PTB patients, with a study power (1-ß) = 0.80, an odds ratio (OR) = 3 and the ratio of PTB patients with drug abuse to those without drug abuse 1:2, a 51 (n1 = 51) PTB patients with drug abuse and 102 (n2 = 102) PTB patients without drug abuse, a total of 153 (n1 + n2 = 51 + 102 = 153) PTB patients were required to detect the potential clinical features.[36] By adjusting non-response at a rate of 10%, a required final sample size was 169.

2. Chest radiographic features detection

To identify the chest radiographic features in this study, unusual or atypical chest radiographic findings among adult PTB patients seemed to be the least prevalent (38%) feature.[37] By using the prevalence (P = 0.38) of this chest radiographic findings among PTB patients, with a study power (1-ß) = 0.80 and an odds ratio (OR) = 3, and the ratio of PTB patients with drug abuse to those without drug abuse 1:2, a 45 (n1 = 45) PTB patients with drug abuse and 90 (n2 = 90) PTB patients without drug abuse, a total of 135 (n1 + n2 = 45 + 90 = 135) PTB patients were required to detect the potential chest radiographic features.[36] By adjusting non-response at a rate of 10%, a required final sample size was 149.

3. Microbiology related findings detection:

To identify the primary drug resistance to one or more anti TB drugs in this study, a recently reported lowest figure of the primary drug resistance to one or more anti TB drugs in our country was 17%.[36] By using the prevalence (P = 0.17) of the primary drug resistance among PTB patients, with a study power (1-ß) = 0.80, an odds ratio (OR) = 3, and the ratio of PTB patients with drug abuse to those without drug abuse 1:2, a 57 (n1 = 57) PTB patients with drug abuse and 114 (n2 = 114) PTB patients without drug abuse, a total of 171 (n1 + n2 = 57 + 114 = 171) PTB patients were required to detect the potential the microbiology related features.[36] By adjusting non-response at a rate of 10%, a required final sample size was 189.

2.6 Sampling Procedure

A consecutive sampling was done to achieve the objectives of the study. Fifty-five patients fulfilling above-mentioned inclusion and exclusion criteria were recruited for group A (25 from the Department of Thoracic Medicine, Jinnah Postgraduate Medical Center (JPMC) Karachi and 30 from Ojha Institute of Chest Diseases (OICD) Karachi) and one hundred and eight patients for group B (all from the Department of Thoracic Medicine, Jinnah Postgraduate Medical Center (JPMC) Karachi.)

2.7. Selection of study persons and data collection

Study persons were recruited from PTB suspects[1] (who were identified by the principal investigator and other colleagues sitting in out patient department. They were interviewed and examined by the principal investigator in out patient department. From these PTB suspects who qualified to be study the cases for both the groups informed verbal consent was taken. They were selected provisionally and the findings were recorded in pre-designed coded questionnaire. Provisionally selected study patients were referred to Department of Radiology of JPMC for Chest X-ray PA view and films were collected on the same day and their findings were recorded in the questionnaire. Sputum AFB smears was done at Medical Unit 3 (Ward 7) Laboratory of JPMC on three consecutive days. Only single morning sputum specimen of each provisionally selected patient was submitted to The Agha Khan University Hospital

[1] PTB suspect is defined as patient with: 1) cough and haemoptysis for two weeks or 2) cough and any other respiratory symptom/s with constitutional symptom/s in any combination- fever, night sweats, anorexia, weight loss or tiredness) [38]

(AKUH) Laboratory for mycobacterial culture and drug sensitivity testing. Sputum AFB smear reports were collected and findings were recorded in the questionnaire. Subsequently patients were explained about their illness and offered treatment. The sputum culture reports were collected on due dates and findings were recorded in questionnaire. Patients who were found to be culture positive for mycobacterium tuberculosis were finally selected as study persons for both groups.

Principal investigator during study period inquired regularly on daily basis from the doctors on duty at Ojha Institute about the admission of drug abusers with PTB in the wards of institute, as the policy of institute is to admit drug abusers with infectious PTB. On receiving information about the admission of drug abusers with PTB, principal investigator was approaching them. Informed verbal consent was taken from the patients. They were interviewed and examined by the principal investigator and selected provisionally according to inclusion and exclusion criteria of group A. Data was recorded in the pre-coded designed questionnaire. Their chest X-rays (PA view) and sputum AFB smears was done at the institute. Subsequently findings of both X-ray and sputum smear reports were recorded in the questionnaire. Single morning sputum specimen of each provisionally selected patient was collected and submitted to AKUH laboratory for mycobacterial culture and sensitivity. Reports of culture were collected and findings recorded in the questionnaire. The patients who were found to be culture positive were finally recruited as study cases for group A.

Note: The principal investigator read X-rays.

2.7 a. Tests

Chest X-rays PA view. These were done with 100KV X-RAY machine at respective departments of JPMC and Ojha Institute and were read by the principle investigator.

Sputum AFB smears. Smears were stained with Zeihl Neelsen staining technique by trained technician and examined and reported by respective microbiologists at both institutes.

Sputum AFB culture and sensitivity. Culture was done at AKUH laboratory on BACTEC radiometric system and the sensitivity for first line anti TB drugs (rifampicin, INH, ethambutal, streptomycin and pyrazinamide) was done with proportion method.

2.7 b. Ethical Considerations

Each selected patient was explained the objective of the study and the procedure they would undergo. They were informed about the confidentiality of the data. Verbal informed consent in the presence of patient's attendant and physician was taken. Selected patients were offered treatment at their respective institutes (JPMC & OICD). They were imparted health education about the disease and were explained about the management of disease.

2.8. Study Variables

These were recorded as mentioned below.

A. Demographic and Socioeconomic characteristics of study population

Age was recorded in years, gender as male or female, marital status as married or un-married, and education as no school education or school education (1-5 years, 6-10 years, > 10years). Present occupation was first recorded as stated by the patient and then coded according to international codes of occupation and place of residence first recorded as stated by the patient and then coded separately for each district of Karachi and other than Karachi.

B. Clinical characteristics of study population

I. Symptoms variables

Chest symptoms: cough, sputum, haemoptysis, pain in the chest, dyspnoea and wheeze were recorded as present or absent and their duration in days.

Constitutional symptoms: fever, weight loss, tiredness, night sweats and anorexia were recorded as present or absent and their duration in days.

Non-chest symptoms were recorded individually as told by the patient as present or absent and then merged as non-chest symptoms and coded as present or absent.

II. Signs variables

General physical signs: temperature was recorded as oral temperature with clinical thermometer in Fahrenheit Scale, respiratory rate as number of breaths per minute,

weight in kilograms, anaemia elicited as pallor of conjunctiva, buccal mucosa and palms and recorded as present or absent and cyanosis (central) and clubbing as present or absent. Lymph nodes were recorded as palpable or not. Cervical, axillary and inguinal regions were palpated for lymph nodes. Other physical signs were noted observed as such and then merged as other physical signs.

Chest signs: findings on auscultation of chest were noted as vesicular sounds, bronchial breath sounds, crackles and wheeze. Presence of only vesicular breath sounds was recorded in the category of normal while presence of other sounds in addition to vesicular breath sounds were recorded in the category of abnormal breath sounds.

III. Other clinical variables

Family history of PTB was recorded as yes if any family member/s (spouse, parents, grand parents, siblings, children, uncle, aunt, cousin and in-laws) was suffering or suffered from pulmonary TB, otherwise no. History of ever contacted with PTB patients: was recorded as yes or no and category of contact person was recorded as household contact or others such as relative, friend, job mate, and neighbourer. For BCG scar both upper arms were examined. It was recorded as present or absent. History of smoking was recorded as yes or no, type of smoking: recorded as cigarettes, beddi, hukka, cigar, or clay pipe or others and duration of smoking in years. For pack years, initially number of cigarettes/ beddi smoked per day was recorded in questionnaire and then pack years were calculated with the help of following formula.

$$\text{Pack Year} = \text{Number} \frac{\text{of cigarettes smoked per day} \times \text{Years smoked}}{20^{*}}$$

History of drug abuse was recorded as yes or no, type of drug abuse as cannabis, opiates or both and then recorded as type of cannabis such as charas or other and type of opiates such as heroin or opium or others. Duration of drug abuse was recorded in months for individual drug, but for multiple drug abuse, the duration of each drug in months was added and mean was calculated and recorded.

C. Variables related to chest radiograph (Chest X-ray PA view) of study population

Lesion on Chest X-ray (PA view) was recorded as visible or not visible (Not visible lesion X-ray was considered as normal chest X-ray). Site of lesion was recorded as unilateral or bilateral (Unilateral means presence of lesion in either of the hemi-thoraces and bilateral means presence of lesion in both hemi thoraces). Side of lesion was recorded as right or left in case of unilateral lesion. Extension of right-sided & Left-sided lesion was recorded as localized or extensive (Localized lesion means any lesion involving single (any) zone in part or whole and Extensive lesion means lesion involving two or all three zones in part or whole). Extension of bilateral lesion was recorded as localized or extensive (Localized lesion means any lesion involving any one zone in each lung in part or whole and extensive lesion means lesion beyond localized). Zone wise involvement was recorded as upper, middle and lower. Type of lesion was recorded as cavitory or non-cavitory. Types of lesion included in cavitory category were isolated nodular/alveolar infiltrates and consolidation while types of lesion included in non-cavitory category were isolated cavitory lesion, abscess, and cavitory lesion with other lesions such as cavitations with infiltrates, cavitations with infiltrates & consolidation, cavitations with infiltrates & abscess.

D. Microbiology related variables of study population

Sputum AFB smears was recorded as negative when all three sputum smears of any patient were found to be negative and positive when one or more sputum smears were found to be positive. Sensitivity to Rifampicin, Isoniazid, Ethambutal, Streptomycin and Pyrazinamide were recorded as sensitive or resistant Other variables were created from above variables. Their definitions are as under:

Fully sensitive: sensitive to all five first line anti TB drugs (rifampicin, INH, ethambutal, streptomycin & pyrazinamide)

Any resistance: resistant to one or more first line anti TB drugs

Mono-resistance: resistant to single first line anti TB drug

Poly-resistance: resistant to two or more first line anti TB drugs

MDR: resistant to at least two anti TB drugs including rifampicin and INH (R & H).

* One standard pack contains 20 cigarettes.

Non R & H MDR: means resistant to two or more first line anti TB drugs except combination of both rifampicin and INH

2.9. Data Management

2.9 a. Questionnare

In order to obtain the required data from the patients, a questionnaire was designed based on the variables mentioned earlier and coded with computer codes. It was developed in English and was administered to each patient by the principal investigator.

2.9 b. Code book and manual of instructions

Manual of instructions and codebook were prepared before pre-testing of questionnaire and later updated in the light of pre-testing and was used as a guideline for the study.

2.9 c. Pre testing of questionnare

The questionnaire was pre-tested on five study patients to explore any ambiguity so far and was revised accordingly.

2.9 d. Data entry and validation

Data entry programme was designed using EPI INFO 6.04 version by making questionnaire, record and check files. Trained data entry operator of the Department of Statistics, Jinnah Postgraduate Medical Center, Karachi did the first entry. Correction was done by principle investigator where needed by comparing computer data file with the original questionnare.

2.10. Data analysis

Two soft wares namely SPSS version 8.0 (Statistical Package for Social Sciences) and EPI info 2000 were used for analysis of data.

2.10 a. Descriptive analysis

In the first step descriptive analyses were done for both the series. To describe distribution of continuous variables means, medians and standard deviation were calculated. For categorical variables (nominal & ordinal) proportions were calculated.

2.10 b. Bivariate analysis

In the second step bivariate analysis was done to explore the association if any between two groups using t-test for continuous variables and Chi-Square test for categorical (nominal and ordinal). Odds ratio, t-statistics, 95% confidence interval (CI) and p value were calculated and reported. Sensitivity, specificity, positive predictive and negative predictive value of some of the variables was done to know their validity and reliability in diagnosing PTB in drug abusers.

3. Results

The comparative results of both the groups- GROUP-A (New PTB patients with drug abuse) & GROUP-B (New PTB patients without drug abuse) and comparative results of both the sub groups: GROUP-A-I (PTB Male patients with drug abuse) & GROUP-B-I (PTB Male patients without drug abuse) are given

3.1. Comparative Results of Both Groups

GROUP-A (New PTB patients with drug abuse) & GROUP-B (New PTB patients without drug abuse)

Out of sixty-six provisionally selected patients for group-A (New PTB patients who smoked cannabis or/and opiates), 55 were found to be sputum culture positive for mycobacterium tuberculosis. The yield of single sputum culture for mycobacterium tuberculosis in this group of patients was 83.3%. And out of 132 provisionally selected patients for group-B (New PTB patients who had no drug abuse) 108 were found to be sputum culture positive for mycobacterium tuberculosis. The yield of single sputum culture for mycobacterium tuberculosis in this group of patients was 81.8%.

The results of finally selected 55 patients in series A and 108 patients in series B were analyzed. The mean age of patient's in-group A was 32.2 years while 35.6 years in-group B. Only one female pulmonary TB patient was found to be abused to drug (Table 1A).

Table 1A Demographic and socio-economic characteristics of study population

Variable	Group A (55) *PTB **Patients With Drug Abuse N (%)	Group B (108) PTB Patients Without Drug Abuse N (%)	OddsRatio/ t-Statistics	95% Confidence Interval	P- Value
AGE	Mean± SD (32.2 ±10.8 years) Range (18 – 56 years)	Mean± SD (35.6 ±15.3years) Range (18 – 70 years)	t= -1.614	7.44, 0.75	0.109 NS
<45 years	33 (78.2)	77 (71.2)	1.11	0.48, 2.67	0.953
45& Above	12 (21.8)	31 (28.8)	1.00	-	NS
GENDER					0.0000006
Male	54 (98.2)	65 (60.2)	35.72	5.6, 1469.51	HS
Female	1 (1.8)	43 (39.8)	1.00	-	-
MARITAL STATUS					
Un-married	28 (50.9)	37 (34.3)	1.99	0.97, 4.06	0.059
Married	27 (49.1)	71 (65.7)	1.00	-	NS

*Pulmonary Tuberculosis ** Who Smoked Cannabis or / and Opiates

Nearly fifty-one percent of patients in group-A were unmarried while 34.3 percent in group-B. Fifty one percent of the patients in group-A never attended the school, a two times more than in group-B with (p-value < 0.05)

Seventy six percent of patients in group-A were production workers, transport operators, laborers and sales and service workers by profession while nearly 42% in group-B were in above-mentioned category of professions (Table 1B).

Table 1B Demographic and socio-economic characteristics of study population

Variable	Group A (55) *PTB **Patients With Drug Abuse N (%)	Group B (108) PTB Patients Without Drug Abuse N (%)	Odds Ratio	95% Confidence Interval	P- Value
EDUCATION					
No School Education	28 (50.9)	36 (33.3)	2.07	1.01, 4.24	0.045
School Education	27 (49.1)	72 (66.7)	1.00		S
1-5 years	12 (44.5)	26 (36.1)			
6-10 years	11 (40.7)	28 (38.9)			
>10 years	4 (14.8)	18 (25.0)			
OCCUPATION					
Professional & Technical	2 (3.6)	8 (7.4)			
Clerical & related workers	0 (0)	5 (4.6)			
Sales /Service workers	14 (25.5)	14 (13.0)			
Agricultural & fisherman					
Production/ Transport	4 (7.3)	8 (7.4)			
Operators & Laborers	28 (50.9)	15 (13.9)			
Students	1 (1.8)	16 (14.8)			
House wives	1 (1.8)	30 (27.8)			
Retired / Not working	0 (0)	9 (8.3)			
Not specify	3 (5.5)	2 (1.9)			
Un-employed	2 (3.6)	1 (0.9)			
RESIDENCE					
Karachi District South	17 (31.0)	26 (24.1)			
Karachi District East	8 (14.5)	26 (24.1)			
Karachi District Malir	8 (14.5)	10 (9.3)			
Karachi District - Central	12 (21.8)	25 (23.1)			
Karachi district West	7 (12.7)	11 (10.1)			
Other than Karachi	3 (5.5)	10 (9.3)			

*Pulmonary Tuberculosis ** Who Smoked Cannabis or/and Opiates.

Cough and sputum was present in all patients in group-A. Twenty percent of the patients in group-A presented with haemoptysis while 32.4 in group-B (p-value > 0.05). Chest pain was present in 50.9% and 43.5% of patients in group-A and group-B respectively (p-value > 0.05). Dyspnoea was the presenting symptom in 43.6% patients in group-A, nearly ten times more than in group-B (p-value < 0.01). Fever and night sweats were the presenting symptoms in 80% and 10.9% of the patients respectively in group-A while 73.1 and 8.3% respectively in group-B (p-values > 0.05). Weight loss was the presenting symptom in 74.5% patients in group-A being 2.6 times more than in group-B (p-value > 0.05). Tiredness was present in 49.1% of the patients in group-A, a two times more than in group-B (p-values > 0.05). Eighteen percent of the patients in group-A presented with anorexia twice more than in group-B (p-value > 0.05). Non-chest symptoms were present in less number of patients in both the groups (Table 2A).

Table 2A Clinical characteristics of study population - symptom variables (Occurrence of symptoms)

Variable	Group A (55) *PTB **Patients With Drug Abuse N	(%)	Group B (108) PTB Patients Without Drug Abuse N	(%)	Odds Ratio	95% Confidence Interval	P- Value
Chest Symptoms							
COUGH							
Absent	0	(0)	6	(5.6)	-	-	-
Present	55	(100)	102	(94.4)			
SPUTUM							
Absent	0	(0)	20	(18.5)	-	-	-
Present	55	(100)	88	(81.5)			
HAEMOPTYSIS							
Absent	44	(80)	73	(67.6)	1.0	-	-
Present	11	(20)	35	(32.4)	0.92	0.22, 1.19	0.1388 NS
CHEST PAIN							
Absent	27	(49.1)	61	(56.5)	0.74	0.37, 1.50	0.466
Present	28	(50.9)	47	(43.5)	1.0	-	NS
DYSPNOEA							
Absent	31	(56.4)	100	(92.6)	1.0	-	-
Present	24	(43.6)	8	(7.4)	9.68	3.69, 27.11	0.00001 HS
WHEEZE							
Absent	53	(96.4)	108	(100)	-	-	-
Present	2	(3.6)	0	(0)			
Constitutional Symptoms							
FEVER Absent							
Present							
WEIGHT LOSS Absent	11	(20)	29	(26.9)	0.68	0.28, 1.58	0.44 NS
Present	44	(80)	79	(73.1)	1.0	-	
TIREDNESS Absent							
Present	14	(25.5)	51	(47.2)	1.0	-	0.11 NS
NIGHT SWEATS Absent	41	(74.5)	57	(52.8)	2.62	1.22, 2.62	
Present							0.569 NS
ANOREXIA Absent	28	(50.9)	73	(67.6)	1.0	-	
Present	27	(49.1)	35	(32.4)	2.01	0.98, 4.12	0.8 NS
Non-Chest Symptoms							
Absent	49	(89.1)	99	(91.7)	0.74	0.22, 2.69	
Present	6	(10.9)	9	(8.3)	1.0	-	0.11 NS
	45	(81.8)	99	(91.7)	1.0	-	
	10	(18.2)	9	(8.3)	2.44	0.82, 7.20	0.54 NS
	51	(92.7)	101	(93.5)	1.0	-	
	4	(7. 3)	7	(6.5)	1.13	0.23, 4.69	

*Pulmonary Tuberculosis **Who Smoked Cannabis or/and Opiates

The mean duration of cough in group-A patients was 126 days and in group-B patients was 68 days (median 56) (p-value < 0.01). The mean duration of sputum in group-A patients was 99 days and in group-B was 55 days (p-value < 0.01). The mean duration of haemoptysis in group-A patients was 22 days and in group-B was 18 days (p-value > 0.05). The mean duration of chest pain in group-A patients was 98 days and in group-B was 52 days (p-value < 0.01). The mean duration of dyspnoea in group-A patients was 99 days and in group-B was 31 days (p-value < 0.01). The mean duration of fever in group-A patients was 96 days and in group-B was 48 days (p-value < 0.01). The mean duration of weight loss in group-A patients was 113 days and in group-B was 60 days (p-value < 0.01). The mean duration of tiredness in group-A patients was 104 days and in group-B was 60 days (p-value < 0.05). The mean duration of night sweats in group-A patients was 162 days and in group-B was 44 days (p-value > 0.01). The mean duration of anorexia in group-A patients was 118 days and in group-B was 67 days (p-value > 0.01). (Table 2B)

Table 2B Clinical characteristics of study population - symptom variables (Duration of symptoms)

Variable	Group A (55) *PTB **Patients With Drug Abuse N (%)	Group B (108) PTB Patients Without Drug Abuse N (%)	Odds Ratio	95% Confidence Interval	P- Value
CHEST SYMPTOMS					
COUGH	Mean ±SD (125.9±77.7 days) Median112 Range (14-364 days)	Mean± SD (67.9± 49.0 days) Median 56 Range (10-252days)	t = 5.019	34.98, 80.97	0.000 HS
SPUTUM	Mean± SD (99.0± 78.3 days) Median 84 Range (14-364 days)	Mean± SD (55.0 ±39.7 days) Median 42 Range (14-182days)	t = 3.863	21.27, 66.66	0.000 HS
HAEM-OPTYSIS	Mean± SD (21.6 ±15.8 days) Median 14 Range (7-56 days)	Mean± SD (17.8± 20.0 days) Median14 Range (1-84 days)	t = .646	-8.38, 15.94	0.525 NS
CHEST PAIN	Mean± SD (98.2 ±71.7 days) Median 84 Range (28-364 days)	Mean ±SD (52.2 ±40.0 days) Median 42 Range (1-182 days)	t = 3.109	16.02, 75.91	0.004 HS
DYSPNOEA	Mean± SD (99.2 ±93.3 days) Median 70 Range (7-364 days)	Mean± SD (31.5 ±34.0 days) Median 14 Range (14-112days)	t = 3.001		0.005 HS
WHEEZE	Mean± SD (196 ± 237 days) Median196 Range (28–364 days	-			
Constitutional Symptoms					
FEVER	Mean± SD (96.4 ±77.1 days) Median 84 Range (14-364 days)	Mean ±SD (47.7± 35.7 days) Median 28 Range (7-182 days)	t = 3.959	24.03, 73.37	0.000 HS
WEIGHT LOSS	Mean± SD (113.2±74.4 days) Median 84 Range (28 -364 days)	Mean± SD (59.8 ±34.0 days) Median 56 Range (7-140 days)	t = 4.274	28.29, 78.35	0.000 HS
TIREDNESS	Mean± SD (104.5±86.8 days) Median 84 Range (28-364 days)	Mean± SD (59.6 ±34.0 days) Median 56 Range (14-140 days)	t = 2.523	8.69, 31.07	0.017 S

Variable	Group A (55) *PTB **Patients With Drug Abuse N (%)	Group B (108) PTB Patients Without Drug Abuse N (%)	Odds Ratio	95% Confidence Interval	P- Value
Constitutional Symptoms					
NIGHT SWEATS	Mean± SD (162.1±157.2 days) Median73 Range (42-364 days)	Mean± SD (44.3 ±29.0 days) Median 28 Range (21-112 days)	t = 1.186	-46.81, 282.48	0.127 NS
ANOREXIA	Mean± SD (119.7±96.8 days) Median 84 Range (42-364 days)	Mean± SD (66.9 ±40.5 days) Median 84 Range (7- 140 days)	t = 1.578	-19.88, 125.50	0.140 NS

*Pulmonary Tuberculosis **Who Smoked Cannabis or/and Opiates

The mean body temperature recorded in group-A patients was 98.8°F while in group-B 99.2°F. The mean respiratory rate recorded in group-A patients was 19 breaths per minute while in group-B 16 breaths per minute ($p < 0.01$). The mean body weight recorded in group-A patients was 42.9 kilograms while in group-B 46.7 Kg. ($p < 0.01$). Anaemia was present in 45.5% of patients in group-A, a seven times more than in group-B ($p < 0.01$). Abnormal breath sounds and adventitious sounds in addition to normal vesicular breath sounds on auscultation of chest were detected in 76.4% of patients in group-A, being ten times more than in group-B (p value< 0.05) (Table 3).

Other clinical are shown in table 4

Table 3 Clinical characteristics of study population - sign variables

Variable	Group A (55) *PTB **Patients With Drug Abuse N (%)	Group B (108) PTB Patients Without Drug Abuse N (%)	Odds Ratio t statistics	95% Confidence Interval	P- Value
TEMPERATURE	Mean± SD (98.8± 0.84 *°F) Range (98-101°F)	Mean ±SD (99.2±1.5°F) Range (98-104°F)	t = -1.811	-0.694, 3.014	0.072 NS
RESPIRATORY RATE	Mean ±SD (19±3 **bpm) Range (14-26 bpm)	Mean±SD (16±2 bpm) Range (12-23 bpm)	t = 5.066	1.47, 3.36	0.000 HS
WEIGHT	Mean±SD (42.9±6.6***kgs) Range (30-60kgs)	Mean±SD (46.7±9.8 kgs) Range (32-76kgs)	t = -2.950	-6.367, -1.259	0.004 HS
ANAEMIA					
Absent	30 (54.5)	97 (89.8)	1.0	3.03,	0.0000008
Present	25 (45.5)	11 (10.2)	7.35	18.37	HS
CYANOSIS					
Absent	54 (98.2)	108 (100)	-	-	-
Present	1 (1.8)	0 (0)			
CLUBBING					
Absent	46 (83.6)	108 (100)	-	-	0.26
Present	9 (16.4)	0 (0)			NS
LYMPH NODES					
Not-palpable	53 (96.4)	107 (99.1)	1.00	0.20,	-
Palpable	2 (3.6)	1 (0.9)	4.04	240.39	
OTHER SIGNS					
Absent	52 (94.5)	108 (100)	-	-	
Present	3 (5.5)	0 (0)			

Variable	Group A (55) *PTB **Patients With Drug Abuse N	(%)	Group B (108) PTB Patients Without Drug Abuse N	(%)	Odds Ratio	95% Confidence Interval	P- Value
CHEST SIGNS							
Vesicular breath Sounds only	13	(23.6)	82	(75.9)	1.0	-	-
Abnormal & adventitious sounds with vesicular breath sounds	42	(76.4)	26	(24.1)	10.19	4.48, 23.69	0.0 HS
Crackles	28	(66.7)	18	(69.6)			
Crackles & Wheezes	8	(19.1)	1	(3.8)			
Bronchial breath Sounds	2	(4.7)	0	(0)			
Crackles & Bronchial breath Sounds	4	(9.5)	7	(26.6)			

*°F (Degree Fahrenhiet)**Bpm (Breaths Per Minute) ***Kgs (Kilograms)
+Pulmonary Tuberculosis ++Who Smoked Cannabis or/and Opiates

Table 4 Clinical characteristics of study population - other clinical variables

Variable	Group A (55) *PTB **Patients With Drug Abuse N	(%)	Group B (108) PTB Patients Without Drug Abuse N	(%)	Odds Ratio	95% Confidence Interval	P- Value
Past disease other than TB.							
No	55	(100)	100	(92.6)			
Yes	0	(0)	8	(7.4)			
Family history of PTB							
No							
Yes	32	(58.2)	49	(45.4)	1.68	0.83, 3.41	0.167
History of contact with PTB patient	23	(41.8)	59	(54.6)	1.0	-	NS
No							
Yes	22	(40)	49	(45.4)	0.8	0.39, 1.63	0.62
House hold contact	33	(60)	59	(54.6)	1.0	-	NS
Relative	20	(60.7)	50	(84.7)			
Friends Job	3	(9.1)	2	(3.4)			
mates Neighbors	5	(15.1)	2	(3.4)			
History of B.C.G	4	(12.1)	4	(6.8)			
vaccination	1	(3.0)	1	(1.7)			
No							
Yes							
B.C.G scar	43	(78.2)	78	(72.2)	1.38	0.61, 3.27	0.52
Absent	12	(21.8)	30	(27.8)	1.0	-	NS
Present							
	45	(81.8)	80	(74)	1.58	0.66, 3.97	0.36
	10	(18.2)	28	(26)	1.0	-	NS

+Pulmonary Tuberculosis ++Who Smoked Cannabis or/and Opiates Cannabis

Seventy four percent of patients in group-A presented with bilateral lesion on chest X-ray PA view, being seven times more than in patients in group-B ($p< 0.01$). Ninety five percent of patients with bilateral lesion on chest X-ray PA view in group-A presented with extensive lesion, i.e. 66 times more than in patients in group-B ($p < 0.01$). Seventy one percent of patients with unilateral right-sided lesion on chest X-ray PA view in group-A presented with extensive lesion, being 52 times more than in patients in group-B

(p < 0.01). Eighty five percent of patients with unilateral left-sided lesion on chest X-ray PA view in group-A presented with extensive lesion, i.e. 26 times more than in patients in group-B (p < 0.01). Sixty three percent of patients in group-A presented with cavitory lesion on chest X-ray PA view while 55.5% in group-B (p-value > 0.05) (Table 5).

Table 5 Variables related to chest radiograph (CXR –PA. View) of study population

Variable	Group A (55) *PTB **Patients With Drug Abuse N	(%)	Group B (108) PTB Patients Without Drug Abuse N	(%)	Odds Ratio	95% Confidence Interval	P- Value
LESION							
Not visible	0	(0)	1	(0.9)	-	-	-
Visible	55	(100)	107	(91.1)			
Site Of Lesion							
Bilateral	41	(74.5)	31	(29)	7.18	3.25, 16.19	0.00000
Unilateral	14	(25.5)	76	(71)	1.0	-	01 HS
Side Of Unilateral Lesion	14		76				
Right	7	(50)	44	(58)	-	-	-
Left	7	(50)	32	(42)			
EXTENSION							
Extension Of Right Sided Lesion	7		44				
*Localized	2	(28.6)	42	(95.5)	1.0	-	-
** Extensive	5	(71.4)	2	(4.5)	52.5	4.29, 753.10	0.0017 HS
Extension Of Left Sided Lesion	7		32				-
Localized	1	(14.3)	26	(81.3)	1.0	-	0.00167
Extensive	6	(85.7)	6	(18.7)	26.0	2.24,1239.59	HS
Extension Of Bilateral Lesion	41		31				-
***Localized	2	(4.9)	24	(77.4)	1.0	-	0.0
****Extensive	39	(95.1)	7	(22.6)	66.86	11.41, 641.96	HS
ZONE WISE INVOLEMENT							
Right Sided Lesion							
Upper zone	1	(14.3)	38	(86.4)			
Other zones	1	(14.3)	4	(9.1)			
All zones	5	(71.4)	2	(4.5)			
Left Sided Lesion							
Upper zone	0		23	(71.9)			
Other zones	1	(14.3)	4	(12.5)			
All zones	6	(85.7)	5	(15.6)			
Bilateral Lesion							
Upper zone	1	(2.4)	23	(74.2)			
Other zones	1	(2.4)	5	(16.1)			
All zones	39	(95.2)	3	(9.7)			
TYPE OF LESION							
Cavitory	35 (63.6)		60	(56.0)	1.40	0.68, 2.90	0.41 NS
Non-cavitory	20 (36.4)		47	(44.0)	1.0	-	

* Any lesion involving any single zone **Lesion present in two or all three zones
***Lesion confined to any one zone on each side ****Lesion beyond localised lesion
+Pulmonary tuberculosis ++who smoked cannabis or/and opiates

In group-A 85.5, 81.8, 92.7, 87.3 and 98.2% patients were sensitive to rifampicin, isoniazid, ethambutal, streptomycin and pyrazinamide respectively while 91.7, 82.4, 98.1, 96.3 and 97.2% patients were sensitive to rifampicin, isoniazid, ethambutal, streptomycin and pyrazinamide in group-B.

In group-A 14.5 patients were resistant to rifampicin, a 1.87 times more than in group-B (p value > 0.05), in group-A 7.3% of patients were resistant to ethambutal, four times more than in group-B (p value > 0.05) and in group-A 12.7 of patients were resistant to streptomycin, being 3.79 times more than in group-B (p value > 0.05). Forty percent of patients in group-A were resistant to one or more drugs, while 27.8% were resistant in group-B (p >0.05). In group-A, 3.2% patients presented with primary MDR pulmonary TB (at least resistant to rifampicin and INH) while 0.9% in group-B (p > 0.05) (Table 6).

Table 6 Microbiology related (AFB smear, sensitivity & resistance) characteristics of study population

Variable	Group A (55) *PTB **Patients With Drug Abuse N	(%)	Group B (108) PTB Patients Without Drug Abuse N	(%)	Odds Ratio	95% Confidence Interval	P- Value
1. SMEAR							
Positive	53	(96.4)	91	(84.3)	1.0	-	-
Negative	2	(3.6)	17	(15.7)	0.20	0.02, 0.91	0.043 S
2. SENSITIVITY/ RESISTANCE PATTEREN							
RIFAMPICIN					1.0	-	-
-Sensitive	47	(85.5)	99	(91.7)	1.87	0.59, 5.84	0.4 NS
-Resistant	8	(14.5)	9	(8.3)			
ISONIAZID							
-Sensitive	45	(81.8)	89	(82.4)	1.0	-	-
-Resistant	10	(18.2)	19	(17.6)	1.04	0.40, 2.59	0.9 NS
ETHAMBUTAL							
-Sensitive	51	(92.7)	106	(98.1)	1.0	-	-
-Resistant	4	(7.3)	2	(1.9)	4.16	0.57, 46.92	0.1 NS
STREPTOMYCIN							
-Sensitive	48	(87.3)	104	(96.3)	1.0	-	-
-Resistant	7	(12.7)	4	(3.7)	3.79	0.91, 18.36	0.36NS
PYRAZINAMIDE							
-Sensitive	54	(98.2)	105	(97.2)	1.0	-	-
-Resistant	1	(1.8)	3	(2.8)	0.65	0.01, 8.31	0.58NS
3. TOTALLY TESTED	55		108				
***Fully sensitive	33	(60)	78	(72.2)	1.0	-	-
****Any resistance	22	(40)	30	(27.8)	1.73	0.82, 3.62	0.159 NS
ANY RESISTANCE	22		30				
+Mono resistance	17	(77.3)	23	(76.7)	1.0	-	-
++Poly resistance	5	(22.7)	7	(23.3)	0.97	0.20, 4.27	0.778 NS
MONO RESISTANCE	17		23				
Rifampicin (~R)	5	(29.4)	6	(26.0)			
Isoniazid (~~H)	7	(41.3)	14	(61.0)			
Ethambutal (~~~ E)	1	(5.8)	0				
Streptomycin (~~~~S)	4	(23.5)	2	(8.7)			
Pyrazinamide (~~~~~Z)	0		1	(4.3)			
POLY RESISTANCE	5		7				
Resistant to two drugs	3	(60)	7	(100)			
Resistant to three drugs	1	(20)	0				
Resistant to four drugs	1	(20)	0				

RESISTANT TO TWO DRUGS	3		7				
RS	1	(33.3)	2	(28.6)			
RH	1	(33.3)	1	(14.2)			
HE	1	(33.4)	2	(28.6)			
HZ	0		2	(28.6)			
RESISTANT TO THREE DRUGS- **ESZ**	1		0				
RESISTANT TO FOUR DRUGS- **RHSE**	1		0				
Total	55		108				
^*MDR* (INCLUDES RESIS-TANT TO RIFAMPICIN& ISONIAZID						0.13, 2.74 -	
NON RH MDR	2	(3.2)	1	(0.9)	4.0		0.36 NS
	3	(6.5)	6	(5.5)	1.0		-

***Sensitive To All First Line Drugs ****Resistant To One Or More Drugs
+Resistant To One Drug ++Resistant Two or More Drugs
~Rifapmicin ~~Isoniazid ~~~Ethambutal ~~~~Streptomycin ~~~~~Pyrazinamide
^Multi Drug Resistance
*Pulmonary Tuberculosis **Who Smoked Cannabis Or/And Opiates

The sensitivity, specificity, positive predictive and negative predictive value of bilateral extensive all zone radiological lesions in PTB patients with drug abuse were 97.5, 88.4, 92.8 and 95.8 respectively (Table 7)

Table 7 Sensitivity, specificity, positive predictive value and negative predictive value of some clinical variables related to chest radiograph (CXR –PA. VIEW) of study population

Variable	Group A (55) *PTB **Patients With Drug Abuse N	Group B (108) PTB Patients Without Drug Abuse N	Sensitvity %	Specificity %	Positive Predictive Value %	Negative Predictive Value %
OCCURRENCE OF SYMPTOMS						
HAEMOPTYSIS						
Present	11	35	20.0	67.6	23.8	62.4
Absent	44	73				
CHEST PAIN						
Present	28	47	50.9	56.5	37.7	69.3
Absent	27	61				
DYSPNOEA						
Present	24	8	43.6	92.5	75.0	76.3
Absent	31	100				
FEVER						
Present	44	79	80.0	26.8	35.7	72.5
Absent	11	29				
WEIGHT LOSS						
Present	41	57	74.5	47.2	41.8	78.4
Absent	14	51				
TIREDNESS						
Present	27	35	49.1	67.5	43.5	72.2
Absent	28	73				
NIGHT SWEATS						
Present	6	9	10.9	91.6	40.0	68.7
Absent	49	99				
ANOREXIA						
Present	10	9	18.1	91.6	52.6	68.7
Absent	45	99				

DURATION OF SYMPTOMS						
COUGH						
> 3weeks	53	92	96.3	9.8	36.5	83.3
3 weeks & less	2	10				
CHEST PAIN						
> 4 weeks	25	27	89.2	42.5	48.0	86.9
4 weeks & less	3	20				
DYSPNOEA						
> 4 weeks	19	2	79.1	75.0	90.4	54.5
4 weeks & less	5	6				
FEVER						
> 4 weeks	38	36	86.3	54.4	51.3	87.7
4 weeks & less	6	43				
WEGHT LOSS						
> 4 weeks	39	41	95.1	28.0	48.7	88.8
4 weeks & less	2	16				
TIREDNESS						
> 4 weeks	24	24	88.8	31.4	50.0	78.5
4 weeks & less	3	11				
NIGHT SWEATS						
> 8 weeks	3	1	50.0	88.8	54.5	50.0
8 weeks & less	3	8				
ANOREXIA						
> 8 weeks	6	5	60.0	44.4	75.0	72.7
8 weeks & less	4	4				
SIGNS						
ANAEMIA						
Present	25	11	45.4	89.8	69.4	76.3
Absent	30	97				
CHEST SIGNS						
Vesicular Breath Sounds (vbs) only	42	26	76.3	75.9	61.7	86.3
*Abnormal & adventitious sounds with vbs	13	82				
OTHER CLINICAL VARIABLES						
History of contact with PTB patients						
Yes	33	59	60.0	45.3	35.8	69.0
No	22	49				
Family history of PTB						
Yes	23	59	41.8	45.3	28.0	60.5
No	32	49				
Chest Radiograph-Related Variables						
Site of lesion						
Bilateral	41	31	74.5	71.0	56.9	84.4
Unilateral	14	76				
Bilateral lesion with extension of lesion						
***Extensive	39	7	95.1	77.4	84.4	92.3
**Localized	2	24				
Bilateral lesion (Zone-wise)						
All zones	39	3	97.5	88.8	92.8	95.8
Upper zone	1	23				

+Pulmonary tuberculosis ++ Who smoked cannabis or / and opiates * Crackles, Wheezes, Bronchial Breathing ** lesion confined to any one zone on each side **Any lesion beyond localised lesion

3.2. Comparative Results of Both Sub Groups:

GROUP-A-I (PTB Male patients with drug abuse) & GROUP-B-I (PTB Male patients without drug abuse)

Among 55 selected patients for group-A (New PTB patients who smoked cannabis or/and opiates), 54 were male. They were allotted subgroup A-I. Among 108 selected patients for group-B (New PTB patients who had no drug abuse) 52 males were of nearly same age and smoking habits. They were allotted subgroup B-I. The results of finally selected 54 male patients in subgroup A-I and 52 male patients in subgroup B-I were analyzed.

The mean age of patient's in-group A-I was 32.4 years while 34 years in-group B-I (p-value > 0.05). Nearly fifty-two percent of patients in group-A-I were unmarried while 32.7 percent of patients were unmarried in group-B-I (p-value < 0.05). Fifty percent of the patients in group-A-I never attended the school, a two times more than in group-B-I (p-value < 0.05) (Table 8).

Table 8 Demographic and socio-economic characteristics of subgropu population

Variable	Group A (55) *PTB **Patients With Drug Abuse N (%)		Group B (108) PTB Patients Without Drug Abuse N (%)		OddsRatio/ t-Statistics	95% Confidence Interval	P- Value
AGE	Mean± SD (32.4 ±10.8 years) Range (18-56 years)		Mean± SD (34.0 ±11.0years) Range (18-55 years)		t = 0.74	-	0.46 NS
<45 years	42	(77.8)	39	(75)	1.17	0.43, 3.17	0.736
45& Above	12	(22.2)	13	(25)	1.00		NS
GENDER							
Male	28	(51.8)	17	(32.7)	2.22	0.93, 5.32	0.046
Female	26	(48.2)	35	(67.3)	1.00		S
EDUCATION							
No School Education	27	(50)	16	(30.8)	2.25	1.23, 4.09	0.043 S
School Education	27	(50)	36	(69.2)	1.00		
1-5 years	12	(44.5)	11	(30.5)			
6-10 years	11	(40.7)	15	(41.7)			
>10 years	4	(14.8)	10	(27.8)			

*Pulmonary Tuberculosis ** Who Smoked Cannabis or/and Opiates

Cough and sputum was present in all patients in group-A-I. Nearly twenty percent of the patients in group-A-I presented with haemoptysis while nearly 29% in group-B (p-value > 0.05). Fifty percent of the patients in group-A-I presented with chest pain while 38.5% in group-B-I (p-value > 0.05). Dyspnoea was the presenting symptom in 44.4% patients in group-A-I, 13 times more than in group-B-I (p-value < 0.01). Fever and night sweats were the presenting symptoms in 79.6 and 11.1% of the patients respectively in group-A-I while 69.2 and 3.84% respectively in group-B-I with (p-values > 0.05). Weight loss was the presenting symptom in 76% patients in group-A-I, nearly two times more than in group-B-I (p-value > 0.05). Tiredness was present in half of the patients in group-A-I, nearly two times more than in group-B-I (p-values > 0.05). Eighteen percent of the patients in group-A-I presented with anorexia, five times more than in group-B-I (p-value < 0.05). (Table 9A)

Table 9A Clinical characteristics of subgroup population - symptom variables. Occurrence of symptoms

Variable	Group A (55) *PTB **Patients With Drug Abuse N	(%)	Group B (108) PTB Patients Without Drug Abuse N	(%)	Odds Ratio	95% Confidence Interval	P- Value
Chest Symptoms							
COUGH							
Absent	0	(0)	3	(5.8)	-	-	-
Present	54	(100)	49	(94.2)			
SPUTUM							
Absent	0	(0)	13	(25)	-	-	-
Present	54	(100)	39	(75)			
HAEMOPTYSIS							
Absent	43	(79.6)	37	(71.1)	1.0	-	-
Present	11	(20.4)	15	(28.9)	0.63	0.23, 1.70	0.31 NS
CHEST PAIN							
Absent	27	(50)	32	(61.5)	0.63	0.27, 1.45	0.23 NS
Present	27	(50)	20	(38.5)	1.0	-	
DYSPNOEA							
Absent	30	(55.6)	49	(94.2)	1.0	-	-
Present	24	(44.4)	3	(5.8)	13.07	3.44, 71.82	0.0000049 HS
WHEEZE							
Absent	52	(96.3)	52	(100)	-	-	-
Present	2	(3.7)	0	(0)			
Constitutional Symptoms							
FEVER							
Absent	11	(20.4)	16	(30.8)	0.58	0.28, 1.58	0.22 NS
Present	43	(79.6)	36	(69.2)	1.0	-	-
WEIGHT LOSS							
Absent	13	(24.1)	20	(38.5)	1.0	-	-
Present	41	(75.9)	32	(61.5)	1.97	1.22, 2.62	0.11 NS
TIREDNESS							
Absent	27	(50)	34	(65.4)	1.0	-	-
Present	27	(50)	18	(34.6)	1.89	0.98, 4.12	0.11 NS
NIGHT SWEATS							
Absent	48	(88.9)	49	(94.2)	0.49	0.22, 2.69	0.32 NS
Present	6	(11.1)	3	(5.8)	1.0	-	-
ANOREXIA							
Absent	44	(81.5)	50	(96.2)	1.0	-	-
Present	10	(18.5)	2	(3.8)	5.68	0.82, 7.20	0.017 S
Non-Chest Symptoms							
Absent	50	(92.6)	50	(96.2)	1.0	-	-
Present	4	(7. 4)	2	(3.8)	2.00	0.23, 4.69	0.67 NS

*Pulmonary Tuberculosis ** Who Smoked Cannabis or/and Opiates

The mean duration of cough in group-A-I patients was 127 days and in group-B-I patients was 65 days (p-value < 0.01). The mean duration of sputum in group-A-I patients was 100 days and in group-B-I was 52 days (p-value < 0.01). The mean duration of haemoptysis in group-A-I patients was 22 days and in group-B-I was 12 days (p-value > 0.05). The mean duration of chest pain in group-A-I patients was 100 days and in group-B-I was 53 days (p-value < 0.01). The mean duration of dyspnoea in group-A-I patients was 99 days and in group-B-I was 46 days (p-value > 0.05). The mean duration of fever in group-A-I patients was 97 days and in group-B-I was 46 days (p-value < 0.01). The mean duration of weight loss in group-A-I patients was 113 days and in group-B-I was 59 days (p-value < 0.01). The mean duration of tiredness in group-A-I patients was 104 days and in group-B-I was 56 days (p-value < 0.05). The mean duration of night sweats in group-A-I patients was 162 days and in group-B-I was 54 days (p-value > 0.01).

The mean duration of anorexia in group-A-I patients was 120 days and in group-B-I was 63 days (p-value > 0.05). (Table 9B)

Table 9B Clinical characteristics of subgroup population - Symptom variables (Duration of Symptoms)

Variable	Group A (55) *PTB **Patients With Drug Abuse N (%)	Group B (108) PTB Patients Without Drug Abuse N (%)	Odds Ratio	95% Confidence Interval	P- Value
CHEST SYMPTOMS					
COUGH	Mean ±SD (127.2±77.8 days) Median112 Range (14-364 days)	Mean± SD (65.2± 49.6 days) Median 42 Range (10-196days)	t = 4.762		0.000 HS
SPUTUM	Mean± SD (99.8± 78.9 days) Median 84 Range (14-364 days)	Mean± SD (52.5 ± 45.0 days) Median 42 Range (14-182days)	t = 3.370		0.001 HS
HAEM-OPTYSIS	Mean± SD (21.6 ±15.8 days) Median 14 Range (7-56 days)	Mean± SD (12.0± 11.7 days) Median10 Range (1-56 days)	t = 1.940		0.06 NS
CHEST PAIN	Mean± SD (99.8 ±72.6 days) Median 84 Range (28-364 days)	Mean ±SD (45.7 ± 43.8 days) Median 28 Range (1-182 days)	t = 2.955		0.004 HS
DYSPNOEA	Mean± SD (99.2 ±93.4 days) Median 70 Range (7-364 days)	Mean± SD (46.7 ± 56.6 days) Median 14 Range (14-112days)	t = 0.942		0.354 NS
WHEEZE	Mean± SD (196 ± 237 days) Median196 Range (28–364 days)	-			
Constitutional Symptoms					
FEVER	Mean± SD (97.3 ±77.8 days) Median 84 Range (14-364 days)	Mean ±SD (46.3± 40.4 days) Median 28 Range (7-182 days)	t = 3.550		0.000 HS
WEIGHT LOSS	Mean± SD (113.2±74.4 days) Median 84 Range (28 -364 days)	Mean± SD (59.0 ±35.5 days) Median 49 Range (7-140 days)	t = 3.786		0.000 HS
TIREDNESS	Mean± SD (104.5±86.8 days) Median 84 Range (28-364 days)	Mean± SD (55.6 ±33.6 days) Median 49 Range (14-140 days)	t = 2.269		0.028 S
Constitutional Symptoms					
NIGHT SWEATS	Mean± SD (162.2±157.2 days) Median73 Range (42-364 days)	Mean± SD (53.6 ±50.6 days) Median 28 Range (21-112 days)	t = 1.131		0.294 NS
ANOREXIA	Mean± SD (119.7±96.8 days) Median 84 Range (42-364 days)	Mean± SD (63.0 ±29.7 days) Median 63 Range (42- 84 days)	t = 0.792		0.446 NS

*Pulmonary Tuberculosis **Who Smoked Cannabis or/and Opiates

The mean body temperature recorded in group-A-I patients was 98.8°F while in group-B-I 98.9°F (p-value 0.535). The mean respiratory rate recorded in group-A-I patients was 19 breaths per minute while in group-B-I 16 breaths per minute. ($p < 0.01$). The mean body weight recorded in group-A patients was 43 kilograms while in group-B-I 47.8 Kg. ($p < 0.01$). Anaemia was present in 46.3% of patients in group-A-I, 27 times more than in group-B-I ($p < 0.01$). (Table 10)

Abnormal breath sounds and adventitious sounds in addition to normal vesicular breath sounds on auscultation of chest were detected in 76% of patients in group-A-I, a fifteen times more than in group-B-I ($p < 0.05$). (Table 10)

Over 50% of patients in both group had history of contact with TB patients (Table 11)

Table 10 Clinical characteristics of subgropu population - sign variables

Variable	Group A (55) *PTB **Patients With Drug Abuse N (%)	Group B (108) PTB Patients Without Drug Abuse N (%)	Odds Ratio	95% Confidence Interval	P- Value
TEMPERATURE	Mean± SD (98.8± 0.84 *°F) Range (98-101°F)	Mean ±SD (98.9±1.3°F) Range (98-103°F)	t =0.622		0.535 NS
RESPIRATORY RATE	Mean ±SD (19±3 **bpm) Range (14-26 bpm)	Mean±SD (16±2 bpm) Range (12-22 bpm)	t =4.738		0.000 HS
WEIGHT	Mean±SD (43.0±6.6***kgs) Range (30-60kgs)	Mean±SD(47.8 ± 8.5 kgs) Range (32-74kgs)	t = 3.260		0.001 HS
ANAEMIA					
Absent	29 (53.7)	50 (96.1)	1.0	3.38,44.54	0.0000005
Present	25 (46.3)	2 (03.9)	21.5		HS
CYANOSIS					
Absent	53 (98.1)	52 (100)	-	-	-
Present	1 (1.9)	0 (0)			
CLUBBING					
Absent	45 (83.3)	52 (100)	-	-	-
Present	9 (16.7)	0 (0)			
LYMPH NODES					
Not-palpable	52 (96.3)	52 (100)	-	-	-
Palpable	2 (3.7)	0 (0)			
OTHER SIGNS					
Absent	51 (94.4)	52 (100)	-	-	-
Present	3 (5.6)	0 (0)			
CHEST SIGNS					
Auscultatory					
Vesicular breath Sounds only	13 (24.1)	43 (82.7)	1.0	-	-
Abnormal & adventitious sounds with vesicular breath sounds	41 (75.9)	09 (17.3)	15.07	5.33, 43.98	0.000 HS
Crackles	27 (65.9)	7 (77.8)			
Crackles & Wheezes	8 (19.5)	1 (11.1)			
Bronchial breath Sounds	2 (4.9)	0 (0)			
Crackles & Bronchial breath Sounds	4 (9.7)	1 (11.1)			

*°F (Degree Farenhiet) **Bpm (Breaths Per Minute) ***Kgs (Kilograms)
+Pulmonary Tuberculosis ++Who Smoked Cannabis Or/And Opiates

Table 11 Clinical characteristics of subgroup population - other clinical variables

Variable	Group A (55) *PTB **Patients With Drug Abuse N	(%)	Group B (108) PTB Patients Without Drug Abuse N	(%)	Odds Ratio	95% Confidence Interval	P- Value
Past disease other than TB.							
No	54	(100)	46	(88.5)			
Yes	0	(0)	6	(11.5)			
Family history of PTB							
No	32	(59.3)	31	(59.6)	1.01	0.43, 2.39	0.970
Yes	22	(40.7)	21	(40.4)	1.0	-	NS
History of contact with PTB patient							
No	22	(40.7)	24	(46.1)	0.8	0.35, 1.86	0.57
Yes	32	(59.3)	28	(53.9)	1.0	-	NS
House hold contact	19	(59.4)	22	(78.6)			
Relative	3	(9.4)	0	(0)			
Friends Job	5	(15.6)	1	(14.3)			
mates Neighbors	4	(12.5)	4	(6.8)			
History of B.C.G vaccination	1	(3.1)	1	(3.6)			
No	42	(77.8)	42	(80.8)	0.83	0.29, 2.37	0.70
Yes	12	(22.2)	10	(19.2)	1.0	-	NS
B.C.G scar							
Absent	44	(81.5)	42	(80.8)	1.05	0.35, 3.12	0.92
Present	10	(18.5)	10	(19.2)	1.0	-	NS

*Pulmonary Tuberculosis **Who Smoked Cannabis or/and Opiates

Seventy six percent of patients in group-A-I presented with bilateral lesion on chest X-ray PA view, a eight times more than in patients in group-B-I ($p < 0.01$). Ninety five percent of patients with bilateral lesion on chest X-ray PA view in group-A-I presented with extensive lesion, i.e. 54 times more than in patients in group-B-I ($p < 0.01$). Sixty three percent of patients in group-A-I presented with cavitory lesion on chest X-ray PA view while 65.3% in group-B-I (p-value > 0.05) (Table 12).

Table 12 Variables related to chest radiograph (CXR –PA. VIEW) of subgroup population

Variable	Group A (55) *PTB **Patients With Drug Abuse N	(%)	Group B (108) PTB Patients Without Drug Abuse N	(%)	Odds Ratio	95% Confidence Interval	P- Value
SITE OF LESION							
Bilateral	41	(75.9)	15	(28.8)	7.78	3.03, 20.32	0.000001
Unilateral	13	(24.1)	37	(71.2)	1.0	-	HS
SIDE OF UNILATERAL LESION	13		37				
Right	7	(53.8)	22	(59.5)	-	-	-
Left	6	(46.2)	15	(40.5)			
EXTENSION OF RIGHT SIDED LESION	7		22				
*Localized	2	(28.6)	22	(100)	-	-	-
** Extensive	5	(71.4)	0	(0)			
EXTENSION OF LEFT SIDED LESION	6		15		-	-	-
Localized	1	(16.7)	15	(100)			
Extensive	5	(83.3)	0	(0)			
EXTENSION OF BILATERAL LESION	41		15				
***Localized	2	(4.9)	11	(73.3)	1.0	7.08,	0.0000
****extensive	39	(95.1)	4	(26.7)	53.63	578.08	HS
ZONE WISE INVOLEMENT							
RIGHT SIDED LESION							
Upper zone	1	(14.3)	21	(95.5)			
Other zones	1	(14.3)	1	(4.5)			
All zones	5	(71.4)	0	(0)			
LEFT SIDED LESION							
Upper zone	0		14	(93.3)			
Other zone	1	(16.7)	1	(6.7)			
All zones	5	(83.3)	0	(0)			
BILATERAL LESION							
Upper zone	1	(2.4)	10	(66.7)			
Other zone	1	(2.4)	4	(26.7)			
All zones	39	(95.2)	1	(6.6)			
TYPE OF LESION							
Cavitory	34	(63.0)	34	(65.4)	0.9	0.38, 2.15	0.79 NS
Non-cavitory	20	(37.0)	18	(34.6)	1.0	-	-

* Any Lesion Involving Any Single Zone
**Lesion Present In Two Or All Three Zones
***Lesion Confined To Any One Zone On Each Side
****Lesion Beyond Localised Lesion
+Pulmonary Tuberculosis ++Who Smoked Cannabis Or/And Opiates

In group-A-I 85.2, 81.5, 94.4, 87.0 and 98.1% patients were sensitive to rifampicin, isoniazid, ethambutal, streptomycin and pyrazinamide respectively while 88.4, 88.5, 100, 94.2 and 100% patients were sensitive to rifampicin, isoniazid, ethambutal, streptomycin and pyrazinamide in group-B-I. In group-A-I 14.8 patients were resistant to rifampicin, a 1.33 times more than in group-B-I with p value > 0.05, in group-A-I 18.5% of patients were resistant to INH, 1.74 times more than in group-B-I with p value > 0.05 and in group-A-I 13% of patients were resistant to streptomycin, a 2.43 times more than in group-B-I with p value > 0.05. Forty percent of patients in group-A-I were resistant to one or more drugs, while 23% were resistant in group-B-I (p >0.05). In group-A-I, 3.7% patients presented with primary MDR pulmonary TB (at least resistant to rifampicin and INH) while 1.9% in group-B-I (p > 0.05) (Table 13).

Table 13 Microbiology related (AFB smear, sensitivity and resistance) characteristics of subgroup population

Variable	Group A (55) *PTB **Patients With Drug Abuse N	(%)	Group B (108) PTB Patients Without Drug Abuse N	(%)	Odds Ratio	95% Confidence Interval	P- Value
1. SMEAR Positive	53	(98.1)	47	(90.4)	1.0	-	-
Negative	1	(1.9)	5	(9.6)	0.18	0.00, 1.69	0.1 NS
2. SENSITIVITY/ RESISTANCE PATTEREN							
RIFAMPICIN							
-Sensitive	46	(85.2)	46	(88.5)	1.0	-	-
-Resistant	8	(14.8)	6	(8.3)	1.33	0.37, 5.05	0.618 NS
ISONIAZID							
-Sensitive	44	(81.5)	46	(82.4)	1.0	-	-
-Resistant	10	(18.5)	6	(11.6)	1.74	0.52, 6.32	0.3 NS
ETHAMBUTAL							
-Sensitive	51	(94.4)	52	(100)			-
-Resistant	3	(5.6)	0	(0)	-	-	0.32NS
STREPTOMYCIN							
-Sensitive	47	(87)	49	(94.2)	1.0	-	-
-Resistant	7 (13)		3	(5.7)	2.43	0.51, 15.31	
PYRAZINAMIDE							
-Sensitive	53	(98.1)	52	(100)	-	-	-
-Resistant	1	(1.9)	0	(0)			
3. TOTALLY TESTED	54		52				
*Fully sensitive	32	(59.3)	40	(76.9)	1.0	-	-
**Any resistance	22	(40.7)	12	(23.1)	2.29	0.92, 5.87	0.051NS
ANY RESISTANCE	22		12				
+Mono resistance	17	(77.3)	9	(75)	1.0	-	-
++Poly resistance	5	(22.7)	3	(25)	0.88	0.13, 7.03	1.0NS
MONO RESISTANCE	17		9				
Rifampicin (~R)	5	(29.4)	3	(33.3)			
Isoniazid (~~H)	7	(41.2)	5	(55.6)			
Ethambutal (~~~ E)	1	(5.9)	0				
Streptomycin (~~~~S)	4	(23.5)	1	(11.1)			
Pyrazinamide (~~~~~Z)	0		0				
POLY RESISTANCE	5		3				
Resistant to two drugs	3	(60)	3	(100)			
Resistant to three drugs	1	(20)	0				
Resistant to four drugs	1	(20)	0				
RESISTANT TO TWO DRUGS	3		3				
RS	1	(33.3)	2	(66.7)			
RH	1	(33.3)	1	(33.3)			
HE	1	(33.4)	0				
HZ	0		0				
RESISTANT TO THREE DRUGS							
ESZ	1		0				
RESISTANT TO FOUR DRUGS							
RHSE	1		0				
Total	54		52				
^MDR (INCLUDES RESISTANT TO RIFAMPICIN& ISONIAZID	2 (3.7)		1	(1.9)	1.33	0.04, 117.50	1.0 NS
NON RH MDR	3 (5.6)		2	(3.8)	1.0	-	-

*Sensitive to All First Line Drugs **Resistant to One or More Drugs

+Resistant to One Drug ++Resistant to Two or More Drugs

~Rifapmicin ~~Isoniazid ~~~Ethambutal ~~~~Streptomycin ~~~~~Pyrazinamide

^Multi Drug Resistance

ŸPulmonary Tuberculosis ŸŸWho Smoked Cannabis or/and Opiates

4. Discussion, Limitations, Conclusion & Recommendations

4.1. Discussion

This comparative study was hospital-based study conducted among new culture positive PTB patients who smoked cannabis or opiates or both and who never abused any drug. The basic aim of study was to determine and document the clinical and radiological presentation and susceptibility and resistance pattern in new culture positive PTB patients who smoked cannabis or opiates or both and to determine and document differences if any between those new culture positive PTB patients who never abused any drug. The present study is unique in that the data was collected prospectively; all patients were carefully interviewed, examined and investigated.

In our study one sputum culture for mycobacteria was done for each patient, the yield of which in PTB patients with drug abuse and without drug abuse was 83.3% and 81.8% respectively, which is consistent with other international studies.[39] [40]

Our study clearly pointed out the differences in clinical and radiological presentation of PTB among drug abusers and non-drug abusers. Gomez Camacho E et al in 1992 in their study also noted the change in clinical pattern of TB disease in drug addicts.[9]

In our study, the variables where statistically significant differences were observed were: gender of the patients, occurrence of dyspnoea, duration of cough, sputum, chest pain, dyspnoea, fever, weight loss and tiredness, respiratory rate and weight of the patients, presence of anaemia, signs on chest auscultation, and site and extension of lesion on chest X-ray PA view. In most of the remaining variables, observed differences were not significant statistically. These could be chance findings.

To avoid the gender and smoking habit bias among study population, two subgroups of male patients, nearly of same age and smoking habits were selected. Their data was compared at all other variables. Statistically significant difference (OR = 3, $p > 0.05$ at 95% confidence interval) was observed almost of the same variables (occurrence of dyspnoea, duration of cough, sputum, chest pain, fever, weight loss and tiredness, respiratory rate and weight of the patients, presence of anaemia, signs on chest auscultation, site and extension of lesion on chest X-ray PA view).

We found only one female PTB patient with drug abuse in two years study period and included her in our study. This sex difference in our study is explained on the basis that the drug addiction is less prevalent in females in most of the countries including Pakistan and the TB case rate in females is reported to be lower world wide. This finding is consistent with the findings reported in various studies in the literature. [34] [41] [42] [43] [44]

In most of the low-income countries about two thirds of reported patients of TB were male and only on third were female. The low TB case rate in female fundamentally remain unexplained but it could be due to the combination of both biological and social factors as reviewed by Vinod K Dewan and Ana Thorson in 1999 in their article on sex, gender and tuberculosis.[45] Studies from Britain and United States have also shown a male predominance in PTB [46] [47] [48] In Pakistan in 1997, Siddique S et al in their multi-center study on longstanding pulmonary tuberculosis reported less number of females (36 females, 64 males).[49]

Professors J A Phileu of Argentina in his lecture on " Tuberculosis 2000, Problems and Solutions" given during 18th World Congress on the diseases of the chest in San Francisco, USA said; tuberculosis diagnosis should be clinical, bacteriological and radiological.[50]

To suspect pulmonary TB, symptoms and chest X-ray pattern are still considered to be predictive factors. Tatterin P et al in 1999 in multivariate analysis of their study on the validity of medical history, classic symptoms and chest radiograph in predicting pulmonary tuberculosis found chest X-ray pattern and symptoms to be independently predictive factors for PTB.[51]

In our study, dyspnoea was found in large proportion of PTB patients with drug abuse. This could be explained on the basis that all of them had bilateral extensive lesion on chest X-ray PA view. Other contributing factor could be anaemia. This finding is consistent with the findings reported in the literature by Mackie MJ and Ludalam CA.[52]

Our study showed statistically significant difference in mean and median duration of cough, sputum, chest pain, dyspnoea, fever, weight loss and tiredness between two groups of patients The likely reason for longer duration of these symptoms in PTB patients with drug abuse is their delayed or late reporting at proper health facility as they are least bothered about their health and most of them were brought to hospital by their relatives. This finding is consistent with the finding reported in the study on admission for drug and alcohol related problem in Nigerian psychiatric care facilities conducted by Ohaeri JU et al in Nigeria in 1993.[53] The other possible reason could be their desire to keep drug habit hidden from medical attention as it is socially unacceptable.

Most of our PTB patients with drug abuse were tachypnoec. This finding could be due to bilateral extensive disease as S. Satya Sri and A Gordon Leitch also found increased respiratory rate in advanced disease.[54, 55] Other contributing factor could be anaemia, as reasonable proportion of these patients were anemic. Increased respiratory rate is one of the signs of anemia described by Mackie MJ and Ludalam CA.[52]

Mean weight of our PTB patients with drug abuse at the time of presentation was less than the mean weight of those who never abused drug. This could be due to malnourishment, debilitation and poor physical health. This finding is consistent with the findings reported in the literature by Mehndiratta SS et al [56] and Foleys et al. [18]

Reasonable proportion of the PTB patients with drug abuse in our study was found to be anemic which could be due their malnourished status. This finding is consistent with the observation of Yoong K and Cheong E.[57]

Most of the new PTB patients present with no or minimal chest sign but our study showed significant difference in chest auscultation findings among the patients of both groups. Majority of the PTB patients with drug abuse had abnormal and adventitious sounds (crackles, wheeze and bronchial breathing) along with vesicular breath sounds on auscultation of the chest. The contributing factors could be: 1) bilateral extensive disease and cavitory lesion; as most of them had bilateral extensive lesion with cavitation on chest radiograph involving all zones and 2) probably few of them might have an endobronchial TB in addition to parenchymal involvement. These are not helpful in establishing or eliminating the diagnosis of PTB, as these are non-specific signs. [58 59, 60,]

Majority of our PTB patients with drug abuse presented with bilateral extensive lesion with all zone involvement on chest X-ray PA view. This chest X-ray finding is highly sensitive and highly specific with high positive and high negative predictive value for this group of PTB patients. This is not the usual chest X-ray finding seen in new culture positive PTB patients in this age group (18-56 years). This radiological presentation could be due to their immunocompromised status as the unusual chest X-ray findings are commonly seen in other groups of immunocompromised patients like AIDS.[57] The other contributing factor could be undernourishment. This finding is consistent with the finding reported literature by Marati et al.[61]

The higher proportion of PTB patients with drug abuse was found to be AFB smear positive in our study. This could be due to the fact that all these patients presented with cough and sputum and majority of them had cavitory lesion on chest radiograph. This finding is consistent with the findings reported in the literature by Toyota M et al [62] and Wilke JT et al.[63]

In our study more unmarried drug abusers suffered from PTB than those who never abused drugs. The likely explanation is that as compared to married persons more bachelors are abusing drugs or it could be a chance finding. The similar observation is reported by Omoluabi PF [41] Anis-ur-Rehman and Farah Deeba [34] and Kumar et al.[43]

In our study, majority of PTB patients with drug abuse never attended the school. This could be a chance finding or could be explained on the basis that drug addiction is more prevalent in illiterate and less educated group of people in Pakistan reported by Anis-ur-Rehman and Farah Deeba in their study on drug addicts.[34]

In our study the mean age and age range of PTB patients with drug abuse was lower than those who never abused drugs (mean 32.2 years, range 18-56 years) as both drug abuse and pulmonary tuberculosis are more common in adults reported by various authors from different parts of the world. Nearly the same age range 18-54 years of drug

addicts was reported by Anis-ur-Rehman and Farah Deeba [34] and nearly the same mean age 32.2 by Yoong KY et al.[57]

Our study reported difference in the occurrence of weight loss, anorexia and tiredness in both groups of PTB patients. Greater proportion of our PTB patients with drug abuse presented with weight loss, anorexia and tiredness than those who never abused drugs. This could be a chance finding or could be due to their poor physical health and nutrition. Mehndiratta SS and Wig NN in 1998 in their study on long-term cannabis use in India reported poor physical health and nutrition of heavy cannabis users.[56]

Although majority of our PTB patients with drug abuse had cavitory lesion and bilateral extensive disease but the frequency of haemoptysis was low as compared to PTB patients who never abused drugs. This could be a chance finding or the reason might be their under reporting. Under reporting could be due to their poor memory. This finding is consistent with the findings reported by Mehndiratta SS, Wig NN and Verma SK in 1978 in their study.[64] Their charas smokers showed poor memory. Some other features are also supposed to be under reported in our study like non-chest symptoms, family history of PTB and history of B.C.G vaccination.

Few of our PTB patients with drug abuse presented with wheeze. These patients might have endobronchial TB in addition to parenchymal involvement Wheeze is one of the presenting symptoms of endobronchial TB as reported by Mathew JI et al, William DJ et al and Cogalayan et al in their studies on endobronchial TB.[59, 60, 65]

Reasonable percent of our PTB patients with drug abuse had clubbing while no one in other group had the same. This could be a chance finding or explained on the basis of extensive disease, as majority of our PTB patients with drug abuse had bilateral extensive disease. Mac Farlane JT et al in 1979 reported an association between clubbing and extensive or advanced PTB disease [66]

Majority of our PTB patients with drug abuse had cavitory lesion on chest X-ray PA view. This presentation could be a chance finding or might be due to immunocompromised status of drug abusers. Cavitory lesion was found to be among the more common radiographic presentation in immunocompromised patients by Washington L and Miller WJ Jr.[67]

In our study difference was observed among the patients of both groups in some microbiologically related variables. Proportionately more of our PTB patients with drug abuse were resistant to rifampicin, ethambutol and streptomycin compared to those who never abused drugs. Also more of our PTB patients with drug abuse were resistant to one or more first line anti TB drugs and more proportion of these patients had primary MDR TB. These could be chance findings or could be explained on the basis of bilateral disease or perhaps cross infection had occurred among them as they usually smoke drugs in groups. Bilateral disease at the time of presentation were found to be more commonly associated with cases of drug resistant than with drug sensitive tuberculosis reported by al Javad et al.[68]

4.2. Limitations

1. As per calculated sample size, a total of 171 (n1 = 55, n2 = 114) PTB patients were required but we had achieved 95.3% (163) of target total (n1+n2=Total, 55+108+163), hence we are assuming less likely chances of any bias.

2. We had done single sputum culture for mycobacteria due to financial constraints. If we would have done three sputum cultures for mycobacteria then: a) we might have achieved the target sample size and b) the results might have some effect on susceptibility and resistance pattern. The reported yield of single sputum culture is 82% and we have achieved that target but the reported yield of three sputum cultures is more than 99%.

3. Because of time limit, we had selected PTB patients with drug abuse from two institutions.

4.3. Conclusion and Recommendations

It is concluded from our study that the new PTB patients with drug abuse (who smoked cannabis or opiates or both) differ in clinical and radiological presentation from those who never abused drugs. Almost all of them were males presented with symptoms of longer duration. Significant number of them presented with dyspnoea, increased respiratory

rate, anaemia and low body weight. Most of them presented with bilateral extensive lesion more or less with all zones involvement on chest X-ray PA view. Primary MDR TB does not seem to be a major problem in this group of patients.

It is recommended that:

1. A large-scale study should be undertaken to find out the significance of other clinical and radiological variables and microbiologically related variables.
2. Bilateral extensive lesion with all zones involvement (more or less) on chest x-ray PA view (whether cavitory or non-cavitory) should be considered as a diagnostic criterion or finding of PTB in new TB suspect who smokes cannabis or opiates or both, as the sensitivity, specificity, positive predictive and negative predictive value of this finding in this group of PTB patients is very high.
3. The transmission of mycobacterium tuberculosis will continue to flourish unless patients are diagnosed early. Since the drug abusers are recognized as a high risk group for TB and the clinical and radiological presentation is unfavorable in this group of population, a periodical screening at six months interval with chest X-ray PA view for early detection of pulmonary TB disease in drug abusers (who smoke cannabis or/and opiates) should be undertaken to decrease the morbidity of disease and transmission of infection as the chest X-ray facility is available in both public and private sector at almost every city and town of the country. Possibly this could at least be practiced in major cities where bulk of drug addicts exist, at the drug treatment and rehabilitation centers run by social welfare organization, non government organization and government with the help of social workers in collaboration with peoples engaged in TB control activities.

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HEALTH SEEKING FOR STI/RTI – IS IT DETRIMENTAL TO EFFECTIVE HIV PREVENTION EFFORT?

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Abstract

Background : Reproductive Tract Infection (RTI) Sexually Tract Infection (STI) are the cause of significant morbidity among poor women. Particularly ulcerative STIs are the important co-factors for HIV transmission. Previous studies have shown that 70% urban slum dwellers and 92% among village women had experienced at least one gynecological problem. Enabling rural women to seek health care early could substantially reduce the risk of HIV transmission. Though there are different reasons for not seeking health we wanted to document what exactly prevents women from seeking healthcare. Hence this diagnostic study was undertaken to document the experiences of STI/RTI among rural women.

AIM : To document the level of knowledge, existing problems and reasons for not seeking health-care suggest appropriate means of improving health seeking behavior of rural women in the backward district of Tamilnadu, India.

Methods : A semi structured interview schedule was developed and administered among rural women. Respondents were selected from 10 villages of Virudunagar Taluk and district, Tamilnadu, India.

Results : RTI/STI was found among 86% of the respondents but only 2% had ever sought treatment. Forty percent of the respondents showed the opinion that women bear the illness silently. Another 30% of the respondents felt that RTI/STI is shame to women. Knowledge on STIs was lacking among 36% of the respondents.

Conclusion : Prevalence of STI/RTI is quite high among rural women. But rarely women seek health-care. To improve the quality of the life and reduce the risk of HIV transmission multi prolonged strategy is needed to treat RTI/STIs early through behavior change communication supported with adequate infrastructure.

1. Background

India has an estimated 4.5 million HIV positive cases with no systematic surveillance. And HIV/AIDS is not just a problem of High Risk Group as 2.5% of women attending ANC clinic are infected with HIV[1] among general population. Higher incidence of an illness noted among general population is likely to lead to a major public health problem. In the AIDs era, one has to look into different dimension of AIDS, so that risk reduction strategy could be initiated at the right time. Number of studies has pointed out that RTI/STIs causes significant morbidity among common women. Further research has pointed out particularly ulcerative STI is an important co-factor for HIV transmission. Through RTI/STIs are known for many hundred years, not much efforts was initiated prior to AIDS episode. Now it is high time that both health workers and health planners have a serious look at their strategies and make preventive efforts to control RTI/STI. Because, as per estimates every year 160[2] million new ulcerative STIs infection Sough and South East Asia (160 per 1000) occur where India has maximum representation. WHO baseline study has estimated 8.2 lakh STD episodes in Tamilnadu- one of the developed states of India. Other studies have shown that 70% urban slum dwellers had experienced at least one gynecological[3] problems and it was 92% among village women. White discharge and cancer in Uterus and most commonly mentioned[4] disorders

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by women Such high prevalence of RTI/STIs and poor treatment seeking, only 10% of the persons seek treatment at Govt clinics, and several other socio economic factors create high risk[5] environment for the rapid spread of HIV/AIDS.

RTI is not really fully understood by women and by their health care providers. Because untreated such infections could lead to infertility entopic pregnancy, irregular menstruation cancer of anus and genital, abortion and stillbirth. But treatment seeking[6] was poor. Only 7.8% of women had ever sought and received care for their problems. Compared to the magnitude of the problems, treatment seeking is extraordinary low, which could be attributed to lack of knowledge to feeling of shame stigma and cultural taboos attached to sex and sexuality. There area fewer studies to find out why women do not seek health for their reproductive health. And also combination of poorer knowledge and apparent misconception[7] about HIV infection epidemic implies potential risks for late transmission of STI/HIV. Rural women very often present their problems in a subtle manner due to senses of guilt and shame. That means their problems are unnoticed by health provider even though wants a cure.

The other things that prevent women from seeking treatment are non availability of female doctors[8], culture factors, mental depression, loss of wages and unsuitable schedule.

Therefore, with the limited resource and high prevalence rate of STI/HIV, it is important to shed the misconception arising out of lack of awareness and cultural taboos. Women need to sensitized through effective health education programmes because health education does help increase the level of awareness and improve clinic attendance[9].

Studies done elsewhere recommend[10] attempts to improve the women awareness and knowledge to enhance health seeking.

Therefore a the study was conceived with the objective to document the knowledge gap, existing problems and reasons for not seeking health care in order to suggest appropriate means of improving the care seeking behavior of rural women in the backward districts of Tamilnadu, India.

2. Methods

Sample for the study was drawn from 4935 male 4976 female populations in ten villages in Virudhunagar district, Tamilnadu, India. Target area is being served by three sub-centres under two PHCs namely Kannicherry pudur and Amateur. A simple random sampling procedure was adopted to select the respondent. Data pertaining to

1) Socio Demographic Profile,
2) Prevalence of Illness,
3) Treatment Seeking Behavior and
4) Attitude towards RTIs was collected using semi structured interview schedule from 50 women age above 15 years.

3. Result

The demographic and social economic charateristics (age, literacy, material status) of the study population area described in table 1. Women aged 26-35 formed 64% percent of the study population. 38% respondents were above 36 years of age. Another 32% were in the 21-25 years age group. Age at marriage for 56% respondents were 19-20 years while 30% got married below the age of 18 years. Early marriages are still common in rural areas of India.

Community prevalence of RTI:

An attempt was made to find what kind of problems experienced by other women in their locality .34% of women identified vaginal discharge and back pain as the commonest infection among the women in their locality. Another 22% felt that white discharge is most common among women in the locality.

Experience of RTI:

Personal experience of RTI was explored using a simple checklist. Though respondents were initially hesitant to talk about self later given account of all their suffering 20% of the respondents had vaginal discharge, itching and redness. Another 13% had lower back pain. Among those who suffered from some of other illness only 6% of the respondents ever sought treatment. In short 86% of respondents experienced some of other gynecological problems. Meager 2% of the respondents only sought medical help from government hospital, which indicates that there is a clear gap in accessing or paucity of services available in addressing RTI treatment services.

Knowledge about STI:

Knowledge about STD was again collected by a checklist 36% of the respondents thought close contact like living together could transmit STD. Only 18% of the respondents could identify sexual contact with infected could transmit STD. very few (22%) of the respondents felt that STD can be cured.

Attitude towards health seeking for RTI:

Why women do not seek was assessed using checklist. Analysis of the health seeking data reveals that 40% of the respondents felt that the women bear the illness silently. A problem of RTI (36%) was considered as a scheme to a woman. About 10% thought only bad women get STD. Primary source of information was NGO followed by field level government health functionaries.

4. Discussion

Literature review and the present study clearly show that STI is widely present in the hard to reach section of the community. Women's unwillingness to come out for treatment is mainly linked with feelings of stigma. Good numbers of respondents felt ashamed of talking about reproductive infection and willing to bear the illness silently. This perceived stigma and refusal to go for treatment was lack of knowledge about RTI/STI and ignorant about consequences of poor or no treatment. Hence women must be made aware of various symptoms of RTI/STI and importance of timely treatment.

Provision of knowledge alone cannot bring about desired results. There provision of awareness should be followed by quality health services at an affordable cost and at distance and availability of female doctors. Such receptive PHC services would greatly change this and ensure timely treatment seeking of rural women.

If the health system continues to neglect the prevision of RTI/STI care, it could be cause great loss both to the women and the health system as such. Because poorly treated or not treated women would face consequences such as post natal and perpetual sepsis, entopic pregnancy, fetal and prenatal death besides consuming good number of hospital beds and other resources. In similar words, this is likely place unnecessary strain on already over burdened health system in the resource-limited settings like India.

Further more delay in seeking treatment also causes emotional distress among poor women. Therefore the problem of STIs need to be viewed from different angle Viz.; Psychological, economical political and social. Especially psychological and economical aspects must be re-looked at. More often economical reasons such as loosing of wage combined with idea of shame contributors of delay in treatment seeking.

In addressing this concerted awareness generation and behavior modification are needed the most. Provision of peer education could be another important tool in making the women come out and seek treatment early.

To conclude, treatment seeking for RTI/STI among rural women is very low and does affects the HIV prevention effort. Therefore Governmental and Non-governmental organization, health planners and all totter concerned with health care planning must make an attempt to improve the health seeking for RTI and wherever feasible counseling should be provided on risk reduction in HIV transmission.

Table 1 Socio-demographic profile (N=50)

		%
Age		
	Below 20 years	4
	21-25	26
	26-30	16
	31-35	16
	36 & above	38
Literacy		
	Illiterate	32
	Primary	22
	Middle School	14
	High school	18
	Intermediate	14
Marital Status		
	Married	98
	Deserted	2
Age at Marriage		
	19-20Yrs	56
	15-18 Yrs	30
	21-23 Yrs	14

Table 2 Attitude to Women's Health problems

Items of Women's Health Problems	%
a. Women have to bear their illness silently	40
b. Informing about vaginal problems is a shame to a women	36
c. Only bad women will get STI	10
d. Women should treat vaginal discharge at home only	6
e. Having sexual intercourse during menstruation will bring illness husband	8

Table 3 Community Prevalence of RTI.

Reproductive Tract Infection (RTI)	%
1. Over Bleeding	6
2. Vaginal Discharge	34
3. Back Pain	22
4. White discharge	22
5. Miscarriage	10
6. Ulcer/growth on vaginal	6

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HIV PREVALENCE AMONG DIAGNOSED TB PATIENTS - A CROSS SECTIONAL STUDY IN NEPAL - 2005

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Abstract

Introduction : The HIV epidemic has increased the global tuberculosis burden. Estimating the proportion of HIV infection among TB cases can act as early warning system for the spread of TB due to HIV and help in planning the programme activities accordingly. Due to limited data available in SAARC region in this aspect, it is planned to conduct the study in member countries phase-wise. In first phase the study was conducted in Nepal. As second .phase it is going on in Bangladesh & Pakistan. The result of the study conducted at Nepal is highlighted here.

Objectives : To estimate the proportion of HIV infection among Diagnosed TB patients in two centres of Nepal.

Methods : Based on the relevant criteria two centres National TB Centre (NTC), Thimi, Bhaktapur and IMHRC (Iwamura Hospital and Research Centre), Bhaktapur were selected where diagnosed and registered TB patients were counseled, blood sample collected for HIV testing. With consecutive sampling, 600 sample size was chosen and test done among 581 with some exclusion following UNAIDS and WHO testing strategy.

Results : Among 581 registered TB patients tested for HIV (500 at NTC and 81 at IMHRC), 9 patients were HIV positive. Among 500 TB patients at NTC, 59 were registered in DOTS-PLUS as MDR-TB cases; among them 3 were HIV positive. Overall HIV prevalence among TB patients was found to be 1.55% (HIV prevalence among MDR TB patients was 5.09% and Non-MDR TB patients 1.15%)

Conclusion : This study showed low HIV prevalence among TB patients in comparison to the previous study done in 2001/2002 at NTC (2.44%), but HIV prevalence among MDR-TB is considerably high. There is a need to conduct prevalence study at sentinel sites representing entire country and extensive further study among MDR-TB patients.

Keywords: TB, MDR-TB, HIV, SAARC

Introduction

The HIV epidemic has increased the global tuberculosis burden and focused attention the need for strengthening links between TB and HIV/AIDS Programmes in order to tackle these public health emergencies more effectively. Compare to an individual without HIV infection, HIV infected patients are up to 10 times as likely to develop TB. As HIV prevalence in the population increases HIV related TB cases rise rapidly. Countries with a high HIV prevalence rate have been found to report significant number of HIV attributed TB cases by NTP. Though SAARC Region is in low HIV prevalence (0.75% among adults), but all the member states are reporting increasing number of HIV/AIDS cases and the epidemic is spreading rapidly. The danger for SAARC region rests in the low prevalence rates, which may be undermining the gravity of the situation. Such low rates conceal dangerously elevated 'concentrated'

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infection rates among high-risk groups such as CSW, MSM, IDU etc. The fact is that despite the low prevalence rates within this region, the factors are in place to spread HIV/AIDS faster than in any other region globally.

Some countries have already started HIV surveillance survey especially among high risk groups but TB patients have not been included in all the surveys. That is why STC has taken this initiative to do HIV surveillance among TB patients involving all the member states by rotation. The findings of the surveillance is expected to help assess the impact of HIV on tuberculosis epidemic which help on channelizing the resources and the planning of health care services for people who are co-infected with HIV and TB. Estimating the proportion of HIV infection among TB cases can act as early warning system for the spread of TB due to HIV in some member states.

Methodology

The Cross Sectional study was conducted at National Tuberculosis Centre (NTC, Thimi) lab, clinic and Dr. Iwamura Memorial Hospital & Research Centre, Bhaktapur. This study was carried out during November 2005 to May 2006. The study places were selected on the basis of following criteria;

- Adequate number of TB patients.
- Presence of trained counselor who can counsel as well as take blood sample
- Availability of accessible standard laboratory with facility and experience in HIV testing.

Study subjects

All types of newly diagnosed and registered TB patients of both sexes and ages equal to or above 14 years presenting for treatment in the selected diagnostic centres were counseled and only those who agreed to give blood samples for HIV testing after counseling was selected for the test.

Sampling method and sample size: Consecutive sampling was followed; every patient who had met the criteria at a particular site was selected consecutively (on a first come first test basis) till required sample size 600 is reached.

Collection and transport of blood samples: The counselor collected the blood sample themselves. Identity of the patients were kept confidential for other than the counselor by using code number. The counselor then sent the clotted blood sample tube labeled with the patient's code, to the identified laboratory. Along with the sample the counselor also sent a form containing the patient code number, date of collection of the sample and the name of the collection centre. The test laboratory thus was not received patient named data. All the collected samples were sent to the lab on the same day of collection.

HIV -testing: As early as possible the assigned laboratory personnel performed the HIV test following Nepal National Standard HIV testing strategy-1 of National Guidelines for Voluntary HIV/AIDS Counseling and Testing. Determine HIV-1/2 was used for initial testing. If the test result is non-reactive, the sample was considered HIV negative. If the initial test is positive, a second rapid test (Serodia) was used in order to confirm the result. All the positive & 10% of negative samples were sent to National Public Health Laboratory (NPHL), Kathmandu for quality assurance.

Statistical Analysis: Data was analyzed using SPSS version 11 systems.

Results

Among 581 registered TB patients tested for HIV (500 at NTC and 81 at IMHRC), 9 were positive for HIV infection. Among 500 TB patients at NTC, 59 were registered in DOTS-PLUS as MDR-TB case among them 3 were HIV positive. Overall HIV prevalence among TB patients was found to be 1.5% (HIV prevalence among MDR- TB patients was 5% and Non-MDR TB patients 1.15%).

In the study group males are found to be more than female and the largest age groups were those between 20-29 years (table 1). 403 (69.36% are smear positive and 60 (10.33 %) are extra pulmonary among the total TB patients under study (table 2).

Table 3 showed that 6 HIV positives are in productive age group 20-40 years. In relation to HIV status and education, study showed that among 9 HIV positives 4 (44.4 %) are illiterate and 1 belongs to graduate level. Among 403 sputum smear positives 7 (1.7 %)

are HIV positives. Among 103 sputum smear negatives and 60 extra pulmonary cases only 1 is HIV positive in each group (table 6).

Discussion & Conclusion

This study showed low HIV prevalence among TB patients in comparison to the previous study conducted by National Tuberculosis Centre (NTC), Nepal during 2001/2002 in five different testing sites among total sample of 1023 new and re-treatment TB patients, which revealed 2.44% HIV prevalence in TB patients (*annual report 2001/2002, NTC)*[5]. This NTC report showed considerably high HIV prevalence among MDR-TB in compare to this study. Similarly other studies conducted in Netherlands[6] during 1993-2001 among 13,269 TB patients showed higher (4.1%) HIV prevalence among TB patients in comparison to this study.

The TB-HIV problem is currently seems small but has been growing at an alarming rate. As there is increasing trend in HIV infection, there could be a substantial increase of TB-HIV co-infected cases in future. Hence, the TB and AIDS programmes need to address issues of joint planning and protocols to deal with the existing co-infected patients. Surveillance of HIV infection in TB patients needs to continue to monitor the trend of TB/HIV co-infection in all the member States and in this connection extensive further study is needed among MDR-TB patients.

Table 1 Age-Sex distribution of TB patients

	Male		Female		Not Reported		Total	
	No.	%	No.	%	No.	%	No.	%
14 – 19 Yrs	26	6.64	17	9.13			43	7.40
20 - 29 Yrs	151	38.52	84	45.16		0.17	236	40.62
30 - 39 Yrs	86	21.94	45	24.20			131	22.55
40 - 49 Yrs	60	15.30	24	12.90			84	14.46
50 - 59 Yrs	40	10.20	9	4.84			49	8.43
60+ Yrs.	26	6.63	4	2.15		0.17	31	5.34
Not Reported	3	0.76	3	1.61		0.17	7	1.20
Total	**392**	**67.47**	**186**	**32.01**	**3**	**0.52**	**581**	**100.00**

Table 2 Distribution of TB Patients by Age Group & Type of TB

	14–19 Yrs.		20–29 Yrs.		30–39 Yrs.		40–49 Yrs.		50–59 Yrs.		60+ Yrs.		Not Reported		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Sputum Smear Positive	30	69.77	158	66.95	88	67.18	67	79.77	33	67.35	22	70.96	5	71.42	403	69.36
Sputum Smear Negative	7	16.28	42	17.80	25	19.08	12	14.29	9	18.37	8	25.80			103	17.73
Extra pulmonary	4	9.30	31	13.14	15	11.45	4	4.77	5	10.20	1	3.22			60	10.33
Not Reported	2	4.66	5	2.12	3	2.30	1	1.20	2	4.08			2	28.57	15	2.58
Total	**43**	**7.40**	**236**	**40.62**	**131**	**22.55**	**84**	**14.46**	**49**	**8.43**	**31**	**5.34**	**7**	**1.20**	**581**	**100.00**

Table 3 Distribution of TB Patients by Age Group and HIV status

	14–19 Yrs.		20–29 Yrs.		30–39 Yrs.		40–49 Yrs.		50–59 Yrs.		60+ Yrs.		Not Reported		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
HIV positive	1	2.32	3	1.27	3	2.30	1	1.19			1	3.22			9	1.55
HIV negative	42	97.67	230	97.45	128	97.70	82	97.61	49	100	30	96.77	7	100	568	97.76
Not Reported				3	1.27		1	1.19							4	0.69
Total	**43**	**7.40**	**236**	**40.62**	**131**	**22.55**	**84**	**14.46**	**49**	**8.43**	**31**	**5.34**	**7**	**1.20**	**581**	**100.00**

Table 4 Distribution of TB Patients by HIV status & Education

Education	**HIV positive**		**HIV negative**		**Not Reported/ Not Stated**		**Total**	
	No.	%	No.	%	No.	%	No.	%
None	4	44.44	218	38.38			222	38.21
Primary	2	22.22	154	27.11			156	26.85
Secondary	2	22.22	65	11.44	2	5	69	11.88
Higher secondary			78	13.74	2	50	80	13.77
Graduation & above	1	11.11	41	7.21			42	7.23
Not Reported			12	2.11			12	2.07
Total	**9**	**1.55**	**568**	**97.76**	**4**	**0.69**	**581**	**100.00**

Table 5 Distribution of TB Patients by Sex & HIV status

	Male		**Female**		**Not Reported**		**Total**	
	No.	%	No.	%	No.	%	No.	%
HIV positive	4	1.02	5	2.68			9	1.55
HIV negative	385	98.21	180	96.77	3	0.52	568	97.76
Not Reported	3	0.76	1	0.53			4	0.69
Total	**392**	**67.47**	**186**	**32.01**	**3**	**0.52**	**581**	**100.00**

Table 6 Distribution of TB Patients by Type of TB and HIV status

	Sputum Smear Positive		Sputum Smear Negative		Extra Pulmonary		Not Reported		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
HIV positive	7	1.73	1	0.98	1	1.66			9	1.55
HIV negative	395	98.2	100	97.08	59	98.34	14	93.33	568	97.76
Not Reported /Not Stated	1	0.2	2	1.95			1	6.66	4	0.69
Total	**403**	**69.36**	**103**	**17.73**	**60**	**10.33**	**15**	**2.58**	**581**	**100.00**

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QUALITY ASSURANCE OF SPUTUM SMEAR MICROSCOPY IN PRIVATE LABORATORIES IN NEPAL

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Abstract

Setting : Kathmandu and Bhaktapur Districts of Nepal

Objectives : To ensure the selected laboratories provide results which are correct and relevant to the clinical situation of the TB suspects or chest symptomatics.

Methods : From the available list of Private Laboratories in Kathmandu and Bhaktapur districts, 10 laboratories working for sputum microcopy were identified. For each of the participating laboratories a panel of 10 slides stained with Ziehl-Neelsen was prepared in SAARC TB Reference Laboratory and dispatched. Each Centre was requested to have the slides read independently by two (or one if two is not available) readers and send back the results and the slides within two weeks to STC reference lab.

Results : Of the nine laboratories took part in the first round testing; only one laboratory had a Quantitative Error (QE). None of the laboratories have shown any major error.

Conclusion : Prior to involvement of private laboratories in TB control at least external quality assessment (EPT) activity in private laboratories needs to be done.

Key Words : Ziehl-Neelsen, Sputum Smear Microscopy, Quality Assurance, Private Lab, SAARC

Background

South Asian Association for Regional cooperation (SAARC) includes the seven countries- Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. With 22 percent of the global population SAARC region bears over 28 percent of global TB burden. Nearly 2.5 million new cases of TB and more than 0.5 million deaths due to TB occur per year in this region. India, Bangladesh and Pakistan are occupying the first, fifth and sixth position among the 22 high burden countries.

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One of the objectives of STC is to enhance the capacities of TB control in the Region by coordinating the efforts of the National Tuberculosis control programmes of the Member States[1].

Sputum Smear Microcopy is the least expensive and simplest tool used in tuberculosis control programme to diagnose infectious patients, and is a key component of the DOTS strategy. Evidence suggests that a substantial portion of TB patients like patients with other ailment visits private sector for treatment and diagnosis *(Juvekar et al.1995; Uplekar and Rangan 1996).* Consequently private laboratories are also being used for sputum microcopy for diagnosis of infectious TB cases[2, 3].

To have accurate and reliable results quality assurance or quality control system plays an important role. Though in government sector this system of

quality assurance is being practiced but in private laboratories it is lacking.

From the experience of TB control under DOTS strategy, need of involvement of private sector in TB control programme for effective control was felt and process of involvement has already been started in Member States of SAARC region through Public Private Partnership.

SAARC Tuberculosis & HIV/AIDS Centre in Kathmandu as a Regional Coordinating centre has started to perform quality assurance in sputum microcopy of the National TB Reference Laboratories of the seven member countries through external quality assessment (also called proficiency testing). The objective of quality assurance in sputum microcopy is to ensure that the laboratory provided results that are correct and relevant to the clinical situation of the TB suspects.

Under these circumstances Governing Board of STC in its 14th meeting recommended to conduct a study on quality assurance in sputum microscopy in private laboratories in Nepal.

Accordingly STC has conducted this study in Kathmandu & Bhaktapur districts of the Kathmandu valley.

Materials and Methods

Study Design: From the available list of Private Laboratories in Kathmandu and Bhaktapur districts, the laboratories working for sputum microcopy were identified and their consent for participation was taken. From the laboratories willing to participate, 5 from Kathmandu and 5 from Bhaktapur (total 10) were randomly selected for this study. Four from Kathmandu and 5 (total 9) from Bhaktapur districts took part in the study.

For each of the participating laboratories a panel of 10 slides stained with Ziehl-Neelsen was prepared in SAARC TB Reference Laboratory as follows:

For slide preparation known (early morning) sputum samples were used. Known negative sputum samples were pooled and homogenized in a vortex mixer after the addition of glass beads. Requisite number of negative slides were prepared from this pool of negative samples. Similarly, sputum samples giving a '1+ grade smear', '2+ grade smear and '3+ grade smear' were pooled and homogenized separately and requisite number of (1+,2+ and 3+) slides were prepared from each of them respectively. To yield scanty grade specimen, grade 1+ specimen was diluted with equal volume of pooled negative sputum and requisite number of scanty grade slides were prepared. All the prepared smears were rechecked by an experienced technician to confirm the grades of positivity before coding and dispatch.

After preparing the slides, orientation training for the concerned lab technicians was arranged in STC to make them aware about the process of slide checking and filling up reporting forms. During orientation minimum basic information of the respective labs was also collected through the attached form. After orientation a panel of 10 prepared slides for each selected lab was handed over.

Each centre was requested to have the slides read independently by two (or one if 2 not available) readers and send back the results and the slides within 2 weeks.

On receipt, the results were decoded and analyzed using SPSS 11 for windows. The deficiencies will be communicated to the respective centers, along with recommendations for improvements in performance. In case of gross disagreements in results, the slides will be rechecked in receipt to rule out labeling errors. On the basis of the collected basic information some necessary measures will also be suggested for improvement.

Grading of Acid Fast bacilli (AFB) by Ziehl-Neelsen (Z-N) Stained Smear Microscopy

No. of acid-fast bacilli (AFB)	* Fields (immersion fields)	Report	No of fields to be examined
No AFB	Per 100 fields	**Negative** (No AFB observed) (No AFB per 100 fields)	100
1-9 AFB	Per 100 fields	**Scanty** (low positive) (1-9 AFB per 100 fields) **Record exact number**	100
10 to 99 AFB	Per 100 fields	**1+ 9 (or +)** (10-99 AFB per 100 fields)	100
1 to 10 AFB	Per fields	**2+ (or ++)** 1-10 AFB per field in 50 fields	50
More than 10 AFB	Per fields	**3+ (or +++)** More than 10 AFB per field in 20 fields	20

Classification of errors[2]

The report were tabulated and analyzed by using the following guideline

Result being rechecked	Result of Controller				
	Negative	1-9AFB/100f	1+	2+	3+
Negative	Correct	LFN	HFN	HFN	HFN
1-9AFB/100f	LFP	Correct	correct	QE	QE
1+	HFP	Correct	Correct	Correct	QE
2+	HFP	QE	Correct	Correct	Correct
3+	HFP	QE	QE	Correct	Correct

Criteria for acceptable performance;

Set of 10 slides, each slide is worth 10 points, total possible score = 100.

a. HFP and HFN scores- 0

b. LFP, LFN and QE scores- 5

c. Passing score - 90

Results

KATHMANDU

Table 1 Performance of Everest Nursing Home Baneshwor,

S. No.	Slide No.	Result obtained	Expected result	Error type
1	11	2+	3+	No error
2	12	Negative	Negative	No error
3	13	Negative	Negative	No error
4	14	5/100 f	9/100 f	No error
5	15	7/100 f	9/100 f	No error
6	16	Negative	Negative	No error
7	17	7/100	9/100	No error
8	18	1+	1+	No error
9	19	Negative	Negative	No error
10	20	2+	2+	No error

No error of any type was observed in a panel of 10 slides

Table 2 Performance of Sanjeewani Poly Clinic, Jadibutti,

S. No.	Slide No.	Result obtained	Expected result	Error type
1	31	1+	1+	No error
2	32	Negative	Negative	No error
3	33	8/100 f	6/100 f	No error
4	34	Negative	Negative	No error
5	35	6/100 f	7/100 f	No error
6	36	Negative	Negative	No error
7	37	1+	4/100 f	No error
8	38	2+	2+	No error
9	39	3+	3+	No error
10	40	Negative	Negative	No error

No error of any type was observed in a panel of 10 slides.

Table 3 Performance of Koteshwor Medical Hall, Koteshwor

S. No.	Slide No.	Result obtained	Expected result	Error type
1	71	Negative	Negative	No error
2	72	2/100 f	5/100 f	No error
3	73	Negative	Negative	No error
4	74	1/100 f	5/100 f	No error
5	75	Negative	Negative	No error
6	76	2+	2+	No error
7	77	3+	3+	No error
8	78	2+	2+	No error
9	79	2/100	8/100 f	No error
10	80	Negative	Negative	No error

No error of any type was observed in a panel of 10 slides.

Table 4 Performance of S. S. Pharma, Koteshwor

S. No.	Slide No.	Result obtained	Expected result	Error type
1	81	1+	1+	No error
2	82	Negative	Negative	No error
3	83	1+	6/100 f	No error
4	84	Negative	Negative	No error
5	85	2+	3+	No error
6	86	Negative	Negative	No error
7	87	1+	2/100 f	No error
8	88	2+	2+	No error
9	89	1+	9/100 f	No error
10	90	Negative	Negative	No error

No error of any type was observed in a panel of 10 slides.

BHAKTAPUR:

Table 5 Performance of Dr. Iwamura Hospital & Research Centre, Sallaghari

S. No.	Slide No.	Result obtained	Expected result	Error type
1	51	Negative	Negative	No error
2	52	3+	3+	No error
3	53	Negative	Negative	No error
4	54	1+	1+	No error
5	55	Negative	Negative	No error
6	56	1+	1+	No error
7	57	Negative	Negative	No error
8	58	2+	2+	No error
9	59	7/100 f	8/100 f	No error
10	60	1+	7/100 f	No error

No error of any type was observed in a panel of 10 slides.

Table 6 Performance of Suryabinayak Polyclinic:

S. No.	Slide No.	Result obtained	Expected result	Error type
1	41	3+	9/100 f	**QE**
2	42	Negative	Negative	No error
3	43	Negative	Negative	No error
4	44	2+	2+	No error
5	45	Negative	3/100 f	No error
6	46	3+	2+	No error
7	47	3+	3+	No error
8	48	Negative	Negative	No error
9	49	2+	1+	No error
10	50	Negative	Negative	No error

Table 7 Performance of Model Clinic

S. No.	Slide No.	Result obtained	Expected result	Error type
1	21	Negative	Negative	No error
2	22	3+	3+	No error
3	23	Negative	Negative	No error
4	24	2+	2+	No error
5	25	Negative	Negative	No error
6	26	5/100 f	9/100 f	No error
7	27	2+	2+	No error
8	28	Negative	Negative	No error
9	29	9/100 f	9/100 f	No error
10	30	1+	9/100 f	No error

No error of any type was observed in a panel of 10 slides.

Table 8 Performance of Shrestha Pathology, Dudhpati

S. No.	Slide No.	Result obtained	Expected result	Error type
1	1	Negative	Negative	No error
2	2	1+	1+	No error
3	3	1+	9/100 f	No error
4	4	Negative	Negative	No error
5	5	Negative	Negative	No error
6	6	2+	2+	No error
7	7	5/100 f	5/100 f	No error
8	8	Negative	Negative	No error
9	9	3+	3+	No error
10	10	6/100 f	6/100 f	No error

No error of any type was observed in a panel of 10 slides.

Table 9 Performance of S. S. Pathology, Suryabinayak

S. No.	Slide No.	Result obtained	Expected result	Error type
1	61	Negative	Negative	No error
2	62	1+	1+	No error
3	63	Negative	Negative	No error
4	64	5/100 f	5/100 f	No error
5	65	1+	3/100 f	No error
6	66	Negative	Negative	No error
7	67	9/100 f	9/100 f	No error
8	68	2+	3+	No error
9	69	3+	2+	No error
10	70	Negative	Negative	No error

No error of any type was observed in a panel of 10 slides.

Table 10 Analysis of the result

Name of the Private Labs.	HFN	HFP	LFN	LFP	QE	Total errors	Total Score
Everest Nursing Home, Baneshwor, Kathmandu	0	0	0	0	0	0	100
Sanjeewani Polyclinic, Jadibutti, Kathmandu	0	0	0	0	0	0	100
Koteshwor Medical Hall, Koteshwor, Kathmandu	0	0	0	0	0	0	100
S. S. Pharma, Koteshwor, Kathmandu	0	0	0	0	0	0	100
Dr. Iwamura Memorial Hospital & Research Centre, Sallaghari, Bhaktapur.	0	0	0	0	0	0	100
Suryabinayak Policlinic, Suryabinayak, Bhaktapur	0	0	0	0	1	1	95
Model Clinic, Bhaktapur	0	0	0	0	0	0	100
Shrestha Pathology, Dudhpati, Bhaktapur	0	0	0	0	0	0	100
S. S. Pathology, Suryabinayak, Bhaktapur	0	0	0	0	0	0	100

The result revealed that more than 99% of the Laboratories reported no errors of any type.

Discussions and conclusions

Quality assurance of Sputum Smear Microcopy is one of the methods recommended for external quality assessment (EQA).

Present study of quality assurance of Sputum Smear Microcopy in Private Laboratories in Nepal was done for the first time in the region. Of the nine laboratories took part in the first round testing; only one laboratory had a QE. Non of the laboratories have shown any major error.

It is recommended that prior to involvement of private laboratories in TB control at least external quality assessment (EPT) activity in private laboratories needs to be done & subsequently training/orientation for the staff needs to be conducted to provide quality service.

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