



SAARC

(South Asian Association for Regional Cooperation)

Journal of Tuberculosis, Lung Diseases and HIV/AIDS



EDITORIAL

Original Articles

1. **PERSONAL EFFECTIVENESS OF PUBLIC HEALTH MANAGEMENT PERSONNEL IN SOUTH EAST ASIA REGION: A STUDY** 1
Jain NP, Md Shahnawaz, Gupta SD, Jha RK, Bhatta GK
 2. **SOCIO-CLINICAL PROFILE OF HIV PATIENTS VISITING TO AN ART CENTRE** 7
Singh AP, Singh S, Alawa HL
 3. **GENDER BASED BARRIERS IN ACCESSING TUBERCULOSIS TREATMENT: A QUALITATIVE STUDY FROM EASTERN NEPAL** 15
Kumar G, Jha N, Niraula SR, Yadav DK, Bhattarai S, Pokharel PK
 4. **GLOBAL HEALTH & TUBERCULOSIS : A RETROSPECTIVE STUDY** 21
Chattu VK, Alzohairy M, Sahrah B, Barsamin F, Albelaihi M
 5. **SPECTRUM OF CHEST X-RAY FINDINGS AMONG HUMAN IMMUNODEFICIENCY VIRUS POSITIVE INDIVIDUALS IN A NIGERIAN TERTIARY HOSPITAL** 27
Akinola RA, Balogun TM, Adeniyi AA, Onakoya JAA, Fadeyibi IO
 6. **HIGH RISK OF IMMUNE RECONSTITUTION INFLAMMATORY SYNDROME DEVELOPMENT AMONG PEOPLE LIVING WITH HIV/AIDS IN FAR-WESTERN REGION OF NEPAL** 35
Mishra SK, Sharma R, Mahat T, Gupta BP
 7. **A STUDY ON SOCIODEMOGRAPHIC PATTERN AND SIDE EFFECTS OF ANTI-TUBERCULAR DRUGS AMONG TUBERCULOSIS PATIENTS IN POKHARA VALLEY** 41
Bhattarai S, Thapa P, Shrestha C, Dangol S, Niroula T, Verma SC
- Case study**
8. **TUBERCULOUS TENOSYNOVITIS PRESENTING AS GANGLION OF WRIST** 45
Chavan S, Sable SS, Tekade S, Punia P
 9. **ASSOCIATION OF FOOD AND DRUG ALLERGY WITH ANTI-TUBERCULOSIS DRUG RELATED HEPATITIS OR SKIN REACTIONS: A CASE CONTROL STUDY** 48
Dassanayake DLB, Asanga Upul BKM, Wickramasekara K, Ileperuma SK, Siribaddana A, Wijewardena KA

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Published and distributed by:

SAARC Tuberculosis and HIV/AIDS Centre (STAC)

Thimi, Bhaktapur

G.P.O. Box 9517, Kathmandu, Nepal

Tel.: 00977-01-6632601, 6632477, 6631048

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AIMS AND SCOPE:

The SAARC Journal of Tuberculosis, Lung Diseases and HIV/AIDS is the official journal of the STAC. The Journal's main aim is the continuing education of personnel and the dissemination of the most up-to-date information in the field of tuberculosis, lung diseases and HIV/AIDS. It is devoted to dissemination of knowledge concerning various aspects of tuberculosis, lung diseases and HIV/AIDS. All articles relevant to the practice of this Journal and quality health research are published. The Journal is an appropriate forum for the publication of articles concerning the social, economic, public health, epidemiology, diagnostics, genetics etc. in the area of tuberculosis, lung diseases and HIV/AIDS. The scientific manuscripts presenting the results of public health importance are encouraged. The novel case reports which adds to the existing knowledge and consistent with the scope of Journal will be considered for publication. The Journal accepts review/mini-review, case report, short communications, and letters to editors within the scope of the journal.

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Print ISSN 1818-9741

Online ISSN 2091-0959

Editorial

All SAARC Member States have a National AIDS Strategy and National AIDS Programmes in place. The SAARC Regional Strategy on HIV and AIDS addresses specific opportunities and challenges common to most countries in the region while identifying priorities that are best addressed collectively at Regional Level. The SAARC has developed SAARC Regional Strategic Framework for Protection, Care and Support for Children Affected by HIV and AIDS (CHABA) and the Member States are working towards a consistent approach across South Asia for the protection, care and support of children affected by HIV and AIDS. In addition SAARC has provided a Monitoring and Evaluation Guidelines of National Responses for Children Affected by HIV/AIDS, which aims to assist countries in this regards.

In order to reduce the number of new HIV infections in children, several countries globally and the SAARC Member States, are focusing on Prevention of Parent to Child Transmission (PPTCT) of HIV. A specific antiretroviral treatment regimen is initiated as prophylaxis to PLHIV who are pregnant as an effective part of PPTCT. The goal is 'eliminating (or stopping) new HIV infections in children and keeping mothers alive'.

With all these tools in place, stigma and discrimination against HIV and AIDS leads to misconceptions and lack of full and correct knowledge about HIV and AIDS. Due to the stigma; approach to this group of affected children can be difficult. Due to social exclusion many people get disowned by their own families and are not in position to get services offered by the communities and government. This makes difference to these children, as many of them are excluded from school, routine health care and social rituals and events.

It is high time that some concrete steps are taken by the governments of Member States, the civil society and PLHIV groups to address these issues. Ideally it should be such that children affected by AIDS have the same rights as other children for availability of health, education and other basic services. Community awareness through mass media campaigns should be prioritized at National as well as Regional level. The SAARC Goodwill Ambassadors for HIV/AIDS are playing a monumental role in the advocacy process regionally to reduce the stigma and discrimination.

PERSONAL EFFECTIVENESS OF PUBLIC HEALTH MANAGEMENT PERSONNEL IN SOUTH EAST ASIA REGION: A STUDY

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ABSTRACT

Introduction: Personal Effectiveness is being the best to oneself by mobilizing motivation and galvanizing cognitive capability in order to address the demand of a given situation. The objectives of the study were: i) to calculate the personal effectiveness scores under the three categories: self-disclosure, openness to feedback, and perceptiveness, ii) to determine the type of personal effectiveness and which dimension of personal effectiveness is lacking among the health personnel mostly. ii) to develop personal effectiveness norms for public health management personnel in South East Asia region under the categories of self-disclosure, openness to feedback and perceptiveness.

Methodology: Personal Effectiveness (PE) scale developed by Prof Udai Pareek was administered on 74 public health management personnel, who attended various leadership and management training programmes during 2009-2012, in South East Asia Region (SEAR). Using 10 as “cut-off” for high or low scores, combining the three dimensions of personal effectiveness the respondents were categorized in to eight categories, ranging from effective to ineffective.

Results: More than three-fourths of the public health management personnel in SEAR were found to be ‘high’ on openness to receiving feedback followed by three-fifths who have ‘high’ perceptiveness. However, less than one-half have ‘high’ self-disclosure. The compositions of the three dimensions of personal effectiveness of all the respondents suggested that about one-fourth were ‘effective’. Nearly one-third of the respondents were found to be ‘secretive’. One out of every ten respondents was found to be “ineffective”.

Conclusion: The public health management personnel need to work upon enhancing their personal effectiveness by sharing and becoming sensitive to others.

Key words: Health Management Personnel, Norms, Personal Effectiveness, South East Asia Region

INTRODUCTION

Senior managers of health care programs around the world have been expressing the urgent need to professionalize the leadership and management of health care services.¹ It is also true that if we want to change others, first we need to change

ourselves. Since the core of change is the self, and understanding about the self (oneself).²

Personal Effectiveness is about unlocking the potential that an individual possess. While personality measurement helps us to see a consistent pattern in a person’s orientation, individuals with different types of personalities can be equally effective. Personal effectiveness refers to beliefs in one’s capacities to derive motivation, cognitive resources and courses of action to meet given situational demands. One precondition for personal effectiveness is better self-awareness. But only understanding oneself does not make a

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person effective. It assesses the consistency in an individual's orientation towards the situation. Different personality types can be equally effective depending on how well s/he knowing oneself and managing the responses of those with whom s/he interacts. Openness is critical for personal effectiveness. It has two aspects—self-disclosure (sharing with others what they do not seem to know about one- self) and use of feedback (being open to what others say on aspects which one may not be aware of). In addition, perceptiveness or sensitivity to others' feelings and to non-verbal cues is also important.³

The Johari Window⁴ model developed by Luft and Ingham [Fig 1] is helpful in understanding two main dimensions of self: those aspects of a person's behavior and response type that are known to him/her (self) and those aspects of his/her behavior that are known to those with whom s/he interacts (others). PE used to help people better understands their relationship with self and others, in the blind and the closed areas.

Arena (A): Part of an individual's behavior known both to him/herself and to those with whom the individual interacts. This area of Arena (Fig.1) includes information regarding name, age, family, appearance and organization.

Blind (B): The blind area suggests those aspects of the personal behavior of an individual known to others, but the person him/herself does not know. A person may behave in a certain way in a situation that is not known to him/her but may be annoying, pleasing or funny.

Closed (C): This involves which is known to the person but not expressed to others. There are many situations when an individual do not wish to reveal his/her feelings.

Dark (D): This area is termed as dark as it is inaccessible to both self and others. This can't be consciously controlled.

In this model, the size of the arena is crucial for PE. This area increases in size to the proportion of decrease.

In this backdrop, this paper is an attempt to further discuss the issue under three specific objectives: i) to calculate the personal effectiveness scores under the three categories: self-disclosure, openness to

feedback, and perceptiveness, ii) to know the type of personal effectiveness and which dimension of personal effectiveness is lacking among the health personnel mostly. ii) to develop PE norms for public health management personnel in South East Asia region under the categories of self-disclosure, openness to feedback and perceptiveness.

METHODOLOGY

Personal Effectiveness scale, developed by Prof Udai Pareek¹, was administered on 74 public health management personnel, who attended various leadership and management training programmes during 2009-2012, in South East Asia Region (SEAR). The scale contains 15 statements, five for each of the three dimensions. The reliability of the scale was 0.90 (Pareek 2010). The respondent read the each statement, indicating the extent to which it is true of him/her on a five-point likert scale. The range of scores for each dimension to an individual could be between 0 and 20. The responses were categorized into 10 or less than 10 (considered as 'low') and above 10 (considered as 'high') as suggested by Prof Pareek. Further to it based on high or low scores, combining the three dimensions of personal effectiveness i.e. self-disclosure, openness to feedback and perceptiveness, the respondents were categorized in to eight categories, ranging from effective to ineffective. The eight categories are explained in table 1.

Microsoft Excel (MS 2007) and Statistical Package for Social Sciences (SPSS version 16) have been used for analysis. Mean and Standard Deviation (SD) with normal curve of self-disclosure, openness to feedback and perceptiveness were taken into account in order to know the mean norms range of each category with 95 percent Confidence Interval (CI).

RESULTS

The results revealed that more than three-fourths (82%) of the public health management personnel in SEAR were found to be 'high' on openness to receiving feedback followed by 61% who have 'high' perceptiveness. However, less than one-half (46%) have 'high' self-disclosure (figure 2).

The compositions of the three dimensions of personal effectiveness of all the 74 respondents

suggested that about one-fourth (26%) of the public health management personnel of SEAR were 'effective'. Nearly one-third (31%) of the respondents were found to be 'secretive which means with low self-disclosure followed by insensitive i.e. low on perceptiveness (13%), task-obsessed i.e. low on both self-disclosure and perceptiveness (12%). Nearly one out of every ten public health managers was found "ineffective" that is low on all the three dimensions (figure 3). Therefore, it is evident that "self-disclosure" and "perceptiveness" are two dimensions where the public health personnel need to focus upon.

To understand the variations among "high" scores for various PE types, average scores were calculated for the each dimension (table 2). There was no wide variation was observed among "high" average scores of "self-disclosure" except dogmatic type. However, the highest average scores were found to be for effective type. Similarly, all the high scores on openness to feedback were in the range of 14 to 15.9, highest for "effective" and lowest for "insensitive" type.

Among the high scores on perceptiveness, a wide variation could be seen between effective and dogmatic type. However, numbers are too less for dogmatic type to conclude (table 2).

The norms of the personal effectiveness were calculated for 68 managers by Prof Pareek (table 3) in 2002. However, it was felt necessary to calculate the norms for health personnel in South East Asia region.

Norms for Self-disclosure

The mean score for self-disclosure of 74 SEAR health personnel was found to be 10.54 with standard deviation (SD) is ± 3.421 (figure 4). The mean score falls between 9.76 and 11.32 with 95 percent Confidence Interval (CI).

Norms for openness to feedback

The mean score of self-disclosure of the public health personnel was found to be 13.8 with standard deviation (SD) ± 3.37 (figure 5). The mean score falls between 13.03 and 14.56 with 95 percent Confidence Interval (CI).

Perceptiveness

The mean score on perceptiveness of the SEAR

health personnel was 11.85 along with standard deviation (SD) ± 3.43 (figure 6). The mean score falls between 11.06 and 12.63 with 95 percent Confidence Interval (CI).

Table 1. Types of personal effectiveness

Category		Self-disclosure	Openness to feedback	Perceptiveness
1	Effective	High	High	High
2	Insensitive	High	High	Low
3	Egocentric	High	Low	Low
4	Dogmatic	High	Low	High
5	Secretive	Low	High	High
6	Task-obsessed	Low	High	Low
7	Lonely Empathic	Low	Low	High
8	Ineffective	Low	Low	Low

Table 2. Percent distribution of the respondents by their type of personal effectiveness (n=74) and mean score of each group on three dimensions

Category	%	Self-disclosure (Average)	Openness to feedback (Average)	Perceptiveness (Average)
Effective (n=19)	26	High (13.8)	High (15.9)	High (15.1)
Insensitive (n=10)	13	High (13.4)	High (14.0)	Low (8.0)
Egocentric (n=2)	3	High (13.0)	Low (10.0)	Low (8.0)
Dogmatic (n=3)	4	High (12.3)	Low (6.6)	High (12.3)
Secretive (n=23)	31	Low (8.4)	High (14.5)	High (13.4)
Task-obsessed (n=9)	12	Low (7.6)	High (14.6)	Low (9.2)
Lonely Empathic (n=0)	0	Low (0.0)	Low (0.0)	High (0)
Ineffective (n=8)	11	Low (7.1)	Low (9.0)	Low (8.12)
Total (74)	100			

Table 3. Norms for PE dimensions

Variable	Norms calculated as per the SEAR data (n=74)			Norms by Prof. Udai Pareek (n=68)	
	Mean	SD	Norms Range (with 95% CI)	Mean	SD
Self-disclosure	10.54	± 3.42	9.76 to 11.32	10	3
Openness to feedback	13.80	± 3.37	13 to 14.56	14	3
Perceptiveness	11.85	± 3.43	11 to 12.63	13	3

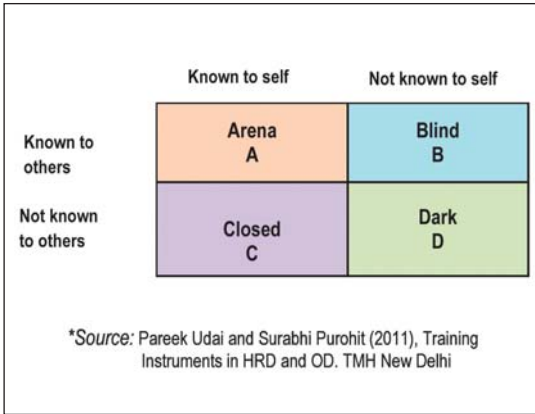


Figure 1. Johari Window* (Joseph Luft, Harrington Ingham, 1955)

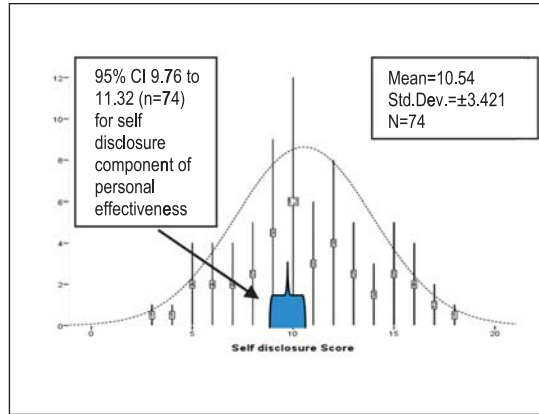


Figure 4. Scores on Self-disclosure plotted on normal probability curve

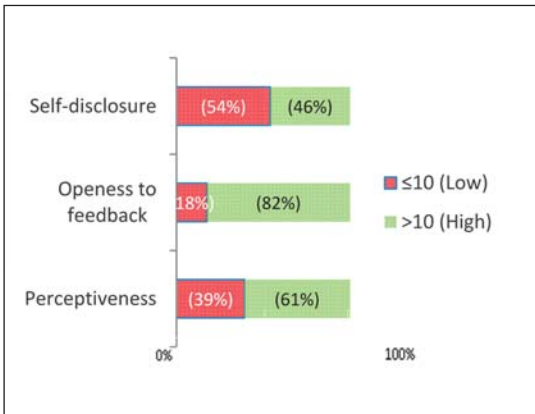


Figure 2. Distribution of the respondents by their scores: >10 and <10 on three dimensions of personal effectiveness

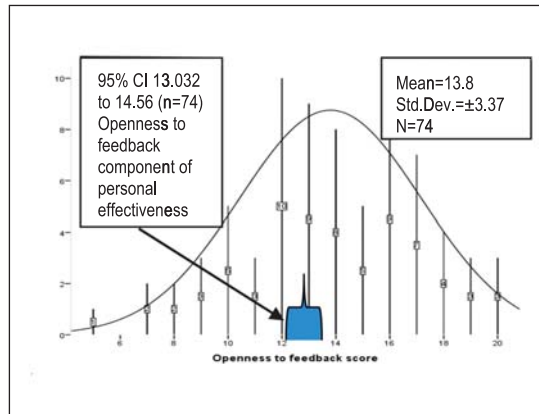


Figure 5. Scores on openness to feedback plotted on normal probability curve

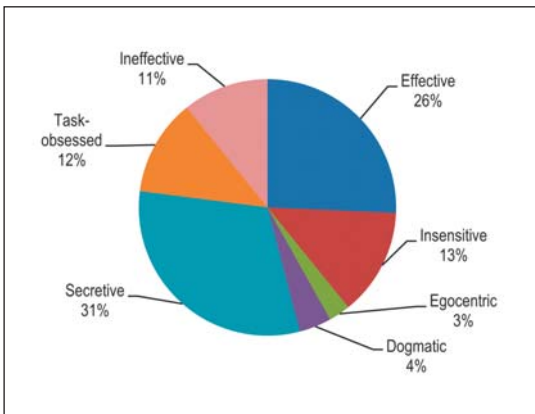


Figure 3. Percent distribution of the respondents by their PE type

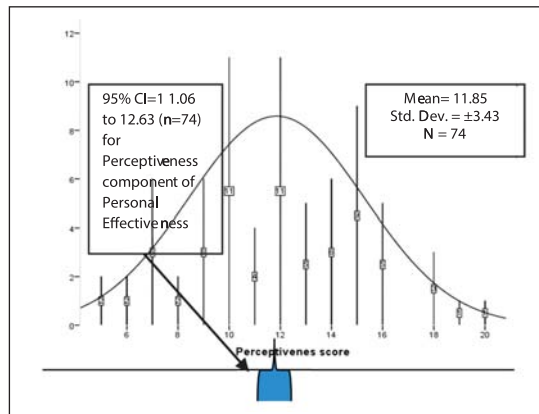


Figure 6. Scores on perceptiveness plotted on normal probability curve

DISCUSSION

Out of three dimensions of personal effectiveness, two aspects *i.e.* self-disclosure and perceptiveness need attention to health management personnel. If the respondents who were found to be low on self disclosure and categorized as “secretive” could work on expressing their feelings to others and become effective. Usually, Secretive type of people find it difficult to be frank with people unless they know them well. They need to enhance their “Arena” for their personal effectiveness by sharing what they want to share is appropriate with others. The extent to which one shares ideas, feelings, experiences, impressions, perceptions appropriately shows the degree of openness. Analysis shows that almost one-third of the SEAR health personnel were found to be ‘Secretive’ and they were lagging behind only in ‘self disclosure’ component of personal effectiveness. Self-disclosure is sometimes misunderstood as disclosing everything about oneself with everyone. Self-disclosure is important achieving goals, such as developing relationship, closeness, gaining emotional support, etc. Effectiveness of self-disclosure depends on how much does the disclosure, as a communication act, accomplish the discloser’s as well as the listener’s goals.^{6,7} With sustained training and practices on sharing of appropriate and relevant ideas, opinions and feelings related to works leads to mutual trust and thus enhance personal effectiveness.⁵

The other group that raises concern with respect to this study is of ‘Insensitive’. Thirteen percent health management personnel under this study group have shown low perceptiveness. They used to say things that turn out of place, fail to pick up cues about others’ feelings and reactions when involved in an argument or a conversation thereby they were being found to be ‘low’ in perceptiveness. Combining perceptiveness with the other two dimensions *i.e.* self-disclosure and openness to feedback, a person who is not open may receive many cues and much feedback from others. Perceptiveness and openness reinforce each other for personal effectiveness. Perceptiveness can be improved by learning and practice like checking with others about their reactions to what has been said, working on one’s listening skills, being aware of language, gestures and facial expressions⁵. This allows people to develop trust and respect that ultimately lead to better service delivery.

In general, people hear criticism at that time but do not bother about it later. Feedback on those aspects of a person about which others are aware but the person him/herself does not know about may be positive or negative. Negative feedback creates dissonance with self-image, and the person tends to be defensive, and generally uses defensive behavior (for example, denial, rationalization, aggression, etc.) to deal with the feedback. However, the main purpose of feedback is to develop mutuality, trust and openness, the more defensive behavior is used, the less effective it will be. The individual receiving feedback need to examine his/ her defensive behavior and prepare to plan (preferable with the help of one or more persons) for reducing it. By being open to receiving feedback, we could reduce our blind area and increasing up Arena. Feedback may be given to others to improve the situation and to reduce their blind areas. We should recognize valid points even if we don’t agree with the other person’s interpretation. Developmental and motivational feedbacks are considered as inevitable aspect of effective performance.

The findings are the same that reflects reliability of the results. A summary of norms calculated for South East Asia region is presented and compared with the norms by Prof Pareek in table 3. It is withstanding to note that there was no difference in these two variables namely “self-disclosure” and “openness to feedback” calculated at different points of time (Prof Pareek in 2002 and the data is used in the study was drawn during year 2009-2012). On the “perceptiveness” dimension there was difference of 1.15 in the mean scores as Prof Pareek has mentioned “13” and the study norms calculated as 11.85. However, the standard deviations were remained almost same.

This study shed light on the norms of health management personnel in this part of the region where the public health situation is in demanding need. The norms can be used for the purpose of reference, research and training in the public health domain.

All the leadership and management development programs need to incorporate personal effectiveness in the contents to start the change within. It will help the person to understand him/ herself which will further give a scope to understand others in a better way.

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SOCIO-CLINICAL PROFILE OF HIV PATIENTS VISITING TO AN ART CENTRE

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ABSTRACT

Introduction: Scenario of the AIDS epidemic, clinical course and pattern of opportunistic infections in HIV patients is changing world-wide. The study aims to fulfill the paucity of socio-clinical profile among the patient of HIV with geographical population of this region.

Methodology: This is a hospital based cross sectional clinical study with a sample size of 110 respondents presenting to ART center at Jayarogya Hospital (JAH) Gwalior from May 2010 to Oct 2011.

Results: Mean age of study population was 35.44 ± 9 . High Frequency of weight loss > 10% ($P < 0.001$), fever ($P = 0.0027$), breathlessness ($P = 0.03$), itching ($P < 0.001$), lymphadenopathy ($P < 0.001$), oral thrush ($P = 0.006$), extra pulmonary tuberculosis ($P = 0.04$), candidiasis ($P = 0.006$) at low CD4 count (< 200) and difference in mean CD4 count ($P = 0.0039$) among male (202.21) and female (291.41) was found to be statistically significant. CD4 counts of the patients were significantly inversely correlated with the number of opportunistic infections and the number of symptoms ($R = -0.369$; $P < 0.001$, $R = -0.223$; $P = 0.019$ respectively)

Conclusion: The study depicts male predominance, young sexually active group vulnerability, with a quite difference in clinical presentation and occurrence of opportunistic infections from other part of the world necessitating formulation of different set of guidelines for subjects of Indian subcontinent to improve life-span of such patients.

Key words: ART, Clinical profile, Heterosexual, Socio-demographic profile.

INTRODUCTION

HIV has rapidly established itself throughout the world over the past three decades, with an estimated 2.5 million persons were prevalently HIV-infected as of 2007.¹ India is the country with the second largest population of HIV infected individuals. There is a changing scenario of the AIDS epidemic in India with 35% of all reported AIDS cases among the age group of 15-24 years, reflecting the younger population vulnerability to the epidemic, shift from high-risk groups such as sex workers to the general population and from urban to rural populations.²

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HIV affects the immune system and reduces the body's defenses to protect against various infectious diseases and cancer.³ Prolonged course of human immunodeficiency virus (HIV) infection is marked by a decrease in the number of circulating CD4+ T helper cells and persistent viral replication, resulting in immunologic decline leading to clinical course and pattern of opportunistic infections varying from patient to patient and from country to country.⁴ The clinical manifestations of HIV infection in India (like other developing countries) are diverse. Spectrum of OIs with which most of the patients present in the clinics, reflects a wide variety of other endemic diseases prevalent within each region.⁵ It is important to understand the presentation of HIV disease in the local context. Such estimates would be useful to guide healthcare workers in the institution of appropriate intervention strategies for the prevention of specific OIs, and also in the decision to initiate ART.^{5,6}

There is plethora of epidemiological and clinical data obtained through various studies on HIV patients conducted in almost all continents and in India.⁶ These data indicate the globally variable presentation of clinical manifestations. However, due to the non availability of recognized reporting centre for AIDS patients in northern region of the state of Madhya Pradesh in India, the quantum of the HIV patient available for the study had been very less till about two years back. Recently, a NACO recognized state AIDS centre (ART) has started running at G. R. Medical College, Gwalior (M.P.). Hence, in this institution the present study had been conducted to fulfill the paucity of socio-clinical profile among the patient of HIV with geographical population of this region.

METHODOLOGY

A total of 110 HIV infected patients has been registered for the study, presenting to antiretroviral treatment center (ART) of Jayarogya hospital between May 2010 to October 2011. The prevalence of HIV/AIDS in Madhya Pradesh as per NACO report is 0.19%, so the calculated sample size for the study is to be 54178 study subjects. Since it's not possible to achieve the calculated sample size in the present study, so we approached to gather the sample through purposive convenient sampling method. According to our methodology we have selected 110 patients in a period of 18 months keeping in mind our feasibility, our convenience and also the reporting rate of HIV patients in ART center. We divided the calendar months in 3 slots each of 10 days. We visited the ART center twice in each slot of 10 days. At each visit we decided to interview 1 patient, as the interviews were too long and since most of the patients declined to participate in the study owing to time constraint and other unexplained issues. At two visits we interviewed 2 patients which took the sample size to a figure of 110.

A pretested proforma was used for recording the patient data. All patients were subjected to detailed history, examination and investigation. Recording tool comprises history of duration and severity of symptoms like cough, fever, diarrhoea, weight loss and lymphadenopathy. Epidemiological details like high risk sexual behavior, homosexuality, history of blood transfusion, intravenous drug abuse, spouse of a known HIV infected patient were also recorded.

Any possibility of professional exposure in health workers, laboratory workers, nurses, and doctors was also elicited. Family, personal, menstrual and obstetric history was looked into and detailed marital history was elicited.

Recording of Clinical Examination for parameters, such as Vital signs, pallor, lymphadenopathy, examination of oral cavity for oral candidiasis, leukoplakia, apthous ulcers, skin lesions, genital lesions and detailed cardiovascular examination was done. Other systems, such as GIT, CNS, RS and skin were also examined for any associated abnormality. Information on age, sex and anthropometric measures were recorded for all cases. Some known cases of HIV infection in the spectrum of the disease were on therapy at the time of presentation. In such patients nature of anti-retroviral therapy and duration was also recorded.

Diagnosis of HIV was confirmed by three rapid tests SD Bioline HIV, Pareekshk HIV ½ triline and Pareekshk HIV ½ Tri-spot. CD4 lymphocyte counts were determined by FACS count (Becton-Dickinson). Socio-Clinical profile of HIV infected patients was assessed and was correlated with their CD4 count. Opportunistic infections were diagnosed using the standard protocol. Statistical analysis for frequency distribution, fisher exact and independent t test was done using SPSS version 12.0. Written consent was taken from all the patients prior to interview and the ethical consideration was taken from the institutional ethical committee (IEC) prior to the advent of the study.

RESULTS

The study comprises of 110 patients of which 81(73.63%) were males and 29 (26.36%) were females. Their socio demographic profile is depicted in table 1. Mean age of study population was 35.44±9.66. Overall male to female ratio was 2.79:1 with 2.53:1 in rural population and 2.80:1 in urban population. CD4 profile of patients in the category <200, 200-350 and >350 cell/μL were 76 (69.09%), 17 (15.45%) and 17 (15.45%) respectively. The major part of the population was constituted by truck drivers, house wives and farmers as 35(31.81%), 22(20%) and 20(18.18%) respectively. Predominant mode of transmission was heterosexual constituting 106 (96.36%), from commercial sex workers (CSWs) 86 (78.18%)

and 20(18.18%) infected spouse respectively followed by parental route in 3 (2.72%) comprising infected blood and blood product in 2 (1.81%) and intravenous drug use by shared needle in 1 (0.90%), undetermined transmission in 1 (0.90%).

Table 1. Socio demographic profile of study participants

Socio demographic variables		Male	Female	Total
Age group (years)	Mean	35.8±9.38	34.4±8.58	35.44±9.66
	15-25	9(11.11)	5(17.24)	14(12.72)
	26-35	35(43.20)	13(44.82)	48(43.63)
	36-45	26(32.09)	8(27.58)	34(30.90)
	46-55	10(12.34)	3(10.34)	13(11.81)
	>55	1(1.23)	0	01(0.90)
Marital status	Married	73(90.12)	21(72.41)	94(85.45)
	Unmarried	8(9.87)	2(6.89)	10(9.10)
	Widowed/ Widower	0	6(20.68)	6(5.45)
Residence	Rural	42(51.85)	14(48.27)	56(50.90)
	Urban	39(48.14)	15(51.72)	54(49.09)
Occupation	Laborer	13(16.04)	2(6.89)	15(13.63)
	Farmer	18(22.22)	2(6.89)	20(18.18)
	Truck driver	35(43.20)	0	35(31.81)
	Housewife	0	22(75.86)	22(20)
	Self employed	6(7.40)	2(6.89)	08(7.27)
	Govt. servant	9(11.11)	1(3.44)	10(9.09)
Socioeconomic status*	Low	78(96.29)	24(82.75)	102(92.72)
	Middle	2(2.46)	5(17.24)	7(6.36)
	High	1(1.23)	0	1(0.90)

Data shown in parenthesis are in percent.

*BJ Prasad classification was used to calculate the socioeconomic status. Since no of patients were too low in upper middle and lower middle so this two groups has been cumulatively reported as middle and the same done for the lower to maintain the uniformity, so the overall classification has been reported in three class of low, middle and high and not as upper, upper middle, lower middle, upper lower and lower.

The most common presenting symptom was weight loss >10%, fever and cough in 102 (92.72%) subjects followed by diarrhea 90 (81.81%) and breathlessness 41 (37.27%) mostly seen in patients with CD4 count <200 as shown in (table 2). High Frequency of weight loss > 10% (P<0.001), fever (P=0.0027), breathlessness (P=0.03), itching (P=0.001), lymphadenopathy (P=0.001), oral thrush (P=0.006), extra pulmonary tuberculosis (P=0.04), candidiasis (P=0.006) at low CD4 count (<200) was found to be statistically significant (table 2). Enteric infection was the most common manifestation 80(72.72%) followed by tuberculosis 37 (33.63%) and urinary tract infection 30(27.27%) mostly seen in patients with CD4 count <200 as depicted in (table 2). The number of opportunistic infections and presenting symptoms increased with a decrease in CD4 counts, with a highly significant inverse correlation (R=-0.369, P<0.001), (R=-0.223, P=0.019) between number of opportunistic infection and CD4 count, symptoms and CD4 count respectively (table 3). Independent t test for HIV Positive among male, female and rural, urban groups has been shown in (table 4). Difference in mean CD4 count (P=0.0039) among male (202.21) and female (291.41) was found to be statistically significant (table 4).

Out of 37 subjects 25 (67.56%) had pulmonary tuberculosis (PLTB), 8 (21.62%) had extra pulmonary tuberculosis (EXPLTB) and 4 (10.81%) with both. Out of 25 subjects with PLTB 17(68%) were male as compared to 8(32%) female with a male to female ratio 2.12:1 while in EXPLTB figure for male and female was 8(100%) and 0(0%) respectively. Independent t test for PLTB and EXPLTB/both among male and female and rural and urban population has been shown in (table 5). Chest X ray PA view, among 25 pulmonary tuberculosis cases, comprises normal in 2(8%), unilateral lesions in 13 (52%) out of which lower lobe infiltration was the most common 5(20%) followed by fibro cavitary lesions 3(12%), pleural effusion 2(8%) and others 3(12%), bilateral lesions in 10 (40%) with extensive infiltration in 8 (32%) and miliary tuberculosis in 2 (8%). Hepatitis B co infection with HIV was found in 5 (4.54%) subjects.

Symptoms and manifestations	CD4 count			Total (n=110)	Fisher's exact test (two-tailed p-value)
	>350 (n=17)	350-200 (n=17)	<200 (n=76)		
Weight loss >10%	12	15	75	102(92.72)	<0.001*
Fever	12	16	74	102(92.72)	0.0027*
Cough	15	15	72	102(92.72)	0.31
Diarrhea	12	14	64	90(81.82)	0.50
Breathlessness	4	11	26	41(37.27)	0.03*
Itching	0	12	18	30(27.27)	<0.001*
Lymphadenopathy	0	6	2	8(7.27)	<0.001*
Pain in abdomen	01	01	03	05(4.45)	0.64
Neurological Symptoms	0	0	4	04(3.63)	0.99
Oral thrush	0	3	0	03(2.72)	0.006*
Enteric infection	10	10	60	80(72.72)	0.10
Tuberculosis (n=37)	4	10	23	37(33.63)	0.05
PTB(n=25)	4	5	16	25(22.72)	0.69
Ext. PTB(n=8)	0	4	4	8(7.27)	0.04*
Both(n=4)	0	1	3	4(3.63)	0.77
UTI	2	8	20	30(27.27)	0.08
Bacterial pneumonitis	1	5	15	21(19.09)	0.25
Contact dermatitis	0	4	9	13(11.81)	0.06
Seborrhic dermatitis	0	3	9	12(10.90)	0.23
Scabies	0	2	8	10(9.09)	0.58
PID	1	1	8	10(9.09)	0.88
Folliculitis	0	1	7	8(7.27)	0.54
Herpes zoster	0	2	1	3(2.72)	0.12
Candidiasis	0	3	0	3(2.72)	0.006*
Cryptococcal meningitis	0	0	1	1(0.90)	0.99
Oral hairy leucoplakia	0	0	1	1(0.90)	0.99

Data shown in parenthesis are in percent. * Variables those are statistically significant.

Variables	Number	N (%)	Mean CD4 count \pm SEM (cells/ml)	Correlation coefficient(R) and Coefficient of determination(r^2)
Symptoms	Zero	3(2.72)	410 \pm 164.51	R=-.223 r^2 =0.05 P=0.019*
	One (Fever)	3(2.72)	445.33 \pm 60.68	
	Two(Fever,cough,weight loss)	6(5.45)	173.33 \pm 44.85	
	Three(Fever,cough, weight loss, Breathlessness)	55(50)	220.96 \pm 20.48	
	Four (Fever, cough, weight loss, Breathlessness, Pain in abdomen)	42(38.18)	209.71 \pm 20.14	
	Five (Fever, cough, weight loss, Breathlessness, Pain in abdomen)	1(.90)	263	
Opportunistic infections	Zero	5(4.54)	200.05 \pm 89.46	R=-0.369 r^2 =0.136 P<0.001*
	One(Enteric infection, Folliculitis, SD, TB)	19(17.27)	271 \pm 35.96	
	Two (Enteric infection, Folliculitis,SD,TB,Scabies, UTI)	47(42.72)	226.89 \pm 23	
	Three (Enteric infection, SD, TB, Scabies, UTI)	25(22.72)	185.44 \pm 18.78	
	Four (Enteric infection, Folliculitis,SD,TB, Scabies, UTI)	8(7.27)	162.75 \pm 28.34	
	Five (Enteric infection, Folliculitis, SD, TB, UTI)	4(3.63)	132.75 \pm 37.72	
	Six (Enteric infection, Folliculitis,SD, TB, Scabies, UTI)	2(1.81)	117.5 \pm 7.50	

SD = Seborrhic dermatitis, TB = Tuberculosis, UTI = Urinary tract infection.

Table 4. Independent t test for HIV Positive among male, female and rural, urban groups

Variables		Differences					(Degree of freedom)	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% confidence interval of differences			
					Lower	Upper		
Age(years)	Male	35.8	9.38	1.036	33.74	37.86	0.70(108)	0.47
	Female	34.41	8.58	1.566	31.21	37.62		
CD4 Count	Male	202.21	122.12	13.48	175.36	229.06	2.94(108)	0.003*
	Female	291.41	198.56	36.25	217.23	365.6		
Hb profile	Male	11.05	3.43	0.37	10.3	11.81	0.97(108)	0.33
	Female	10.41	1.82	0.33	9.73	11.09		
Age(years)	Urban	36.43	9.57	1.29	33.84	39.01	1.12(108)	0.26
	Rural	34.48	8.72	1.15	32.17	36.8		
CD4 Count	Urban	221.13	156.44	21.09	178.82	263.44	0.31(108)	0.75
	Rural	230.16	145.71	19.3	191.48	268.84		
Hb profile	Urban	10.22	2.38	0.32	9.57	10.86	0.73(108)	0.46
	Rural	10.57	1.57	0.20	10.16	10.99		

Table 5. Independent t test for pulmonary TB and extra pulmonary or both among male, female and rural, urban groups

Variables		Differences					(Degree of freedom)	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% confidence interval of differences			
					Lower	Upper		
CD4(PLTB)	Male	195.56	145.59	35.31	120.67	270.46	0.037(23)	0.97
	Female	197.88	144.05	48.01	87.08	308.67		
CD4 (EXPLTB/ BOTH)	Male	151.45	98.49	27.36	91.9	211	0.63(10)	0.54
	Female	105.5	6.36	3.67	89.79	121.21		
CD4 (PLTB)	Rural	210.79	159.64	39.91	125.67	295.9	0.57(23)	0.57
	Urban	176.1	117.8	35.51	96.91	255.29		
CD4 (EXPLTB/ BOTH)	Rural	162.22	96.67	30.57	93.03	231.42	0.93(10)	0.37
	Urban	104.25	74.28	30.32	26.26	182.24		
Age(years, PLTB)	Male	39.31	8.82	2.023	35.06	43.57	0.68(23)	0.50
	Female	36.63	10.77	3.59	28.34	44.91		
Age(years, EXPLTB/ BOTH)	Male	33.91	9.21	2.59	28.05	39.77	0.016(10)	0.98
	Female	34.0	4.24	2.44	23.53	44.47		
Age (years, PLTB)	Rural	39.0	9.59	2.47	33.69	44.31	0.37(23)	0.71
	Urban	37.6	9.49	2.86	31.22	43.98		
Age(years, EXPLTB/ BOTH)	Rural	34.11	7.98	2.52	28.44	39.82	0.10(10)	0.91
	Urban	33.5	10.91	4.45	22.05	44.95		

DISCUSSION

This study demonstrates the socio clinical features of HIV/AIDS patients attending an ART centre at tertiary care centre with a mean age group of 35.44 years which is in accord with studies of Tamuno et al who also reported mean age group of 33.6 years, of subjects visiting to a virology clinic at a tertiary care center in western Nigeria and

33.4 years by Sampaio MS et al from Salvador, Brazil.^{7,8} Maximum ART (73.6%) attendees were in 26-45 year age group as being the sexually active and productive group this group are highly affected evolving a sense of fear and urgency in fight against the disease threatening the presence and future of the nation (7,9-13). The overall male outnumbered the female with male to female ratio 2.79:1 observed in similar other studies like Joge et al, who reported 68.04% male and 31.96%

female attendees at an ART center from a rural tertiary care centre of Maharashtra. Another study from an ART center at a tertiary care hospital in south India by Badiger et al reported that 64.4% visitors were male, similarly Wal et al reported 60.9 % male attendees from a tertiary care hospital in north India (9,12-16) but in contrast to other studies showing female preponderance, as Tamuno et al reported a distribution of 32.8% of male and 67.2% of female subjects, visiting to a virology clinic at a tertiary care center in western Nigeria, with a male to female ratio of 1:2.⁷ This might not be a true representation of female proportion as disease prevalence among both the groups are equal and even female are biologically more vulnerable to HIV/AIDS and more likely to contract infection from their male counterpart.⁷ So the reason behind the scene is that in the existing social milieu, females do not seek medical care fearing ostracism financial constraints, gender bias and social stigma and neglect, attached with the disease decrease the number of females attending the HIV clinics.¹⁷

Married subjects constituted maximum 85.45% of the study population with widowed and widower to be 5.45% Which is in accord with the report of Badiger et al from south India suggesting that 58.4% of the visitor to the ART center were married, similarly 77.1% of the AIDS patients were married in a study conducted by Zaheer et al in and around Aligarh area, Baig et al also reported that a large proportion of subjects, 75.50%, attending an ART center in tertiary care hospital in Rajasthan were married with similar other reports from other part of the country.^{12,14,15,18} As male counterpart acquires the HIV earlier than female, they are likely to die before their wives even if both the members are infected reported by higher widowed in other studies⁷ an indirect indicator of later contraction of infection by females, this deplorable situation land up female widowed population in exchange sexual activity for emotional and financial help leading this population as most important risk factor for HIV infection and continuous transmission in India.^{19,20,21}

Rural population outnumbered urban with slight difference, observed in other studies also, which could be due to frequent migration of rural population as compare to urban for occupational reasons as the maximum population is constituted by truck drivers involving a higher regular mobility in male and house wives in female.^{14,15,22} Majority of population (92.72%) belonged to low

socioeconomic status²² proving the hypothesis that poverty decide social behavior that promote HIV infection²³ and might be also due to negative impact of low socioeconomic status on adherence to therapy.¹⁶

Heterosexual route was found to be the most common mode of transmission in 96.36% which is in accord with other studies. Tamuno et al from western Nigeria reported that 100% of studied subjects had only heterosexual relation. Joge et al from a rural tertiary care centre of Maharashtra also reported that heterosexual route was found to be most common in 94.39% of the patients and only 2.99% of the patients had given a history of blood transfusion. In a study from in and around Aligarh area zaheer et al reported that sexual contact was mood of transmission in 56.3% of the case while blood and blood product were in 14.6% patients, while in 33.3% patients no cause was specified. Baig et al from a tertiary care hospital in Rajasthan also reported that heterosexual mode was found to be the commonest mode of transmission (95.62%),^{7,9,14,15,24} With 78.18% from CSWs and 18.18% from infected spouses, visiting to this CSWs, as women have very little say in decision making, like condom use with their partners, especially if she is economically dependent on her husband.^{15,25} Transmission by other modes like blood transfusion and intravenous drug abuse were low also depicted by other studies.²⁶

Most common presenting complaint was fever, weight loss, cough followed by diarrhea similar to the other studies^{7,9,14,27} but in contrast to data from other part of the world.⁸ The spectrum of opportunistic infections has a similar presentation with data from other part of the country^{12,17,22} but in contrast to studies from other part of the world^{28,29} with tuberculosis being the second commonest opportunistic infection (33.63%) strengthening the high prevalence of fever, cough and weight loss in the studied population.^{12,17,27,30} Low mean CD4 count and high social interaction in male as compare to female might be a reason for higher frequency of PLTB in male subjects than females. A highly inverse correlation was found between the CD4 count and the number of opportunistic infections (OIs) and symptoms per individual suggesting the increase in incidence of OIs and major symptoms with decrease in CD4 count.

Hepatitis B co infection was found to be present in only 4.54% of the study subjects. This was

found to be too low as compared to western data coating an incidence of 90-95% of Hepatitis B co infection among HIV patients. This differential finding might be due to heterosexual route being the most common mode in the study population then infected needle and blood transfusion as in western world. Maximum subjects presented with CD4 count below 200 with each clinical manifestation and symptoms outnumbering the percentage of subjects presenting with CD4 count above 200.⁸ Late diagnosis might be a reason for such a low CD4 count in maximum subjects due to late reporting to ART center making them vulnerable to number of opportunistic infections. Sampaio et al in a study from Brazil showed that men were having high viral load which is suggestive of delayed arrival of this men to health care services. Chakravarty et al in a study from Institute of Medical Sciences BHU reported that CD4 count was significantly higher in female at time of presentation (323 ± 28.26 vs 179 ± 9.3 ; $p < .000$). they reported that most of the female acquired their infection through their husband and high CD4 values among this female is an indirect indication of later contraction of infection by females as suggested in our study.^{8,17}

CONCLUSION

Study reported younger age group vulnerability with mean age group of studied subjects 35.4 years. The similar finding has been reported from other part of the world suggesting sexually active younger age group as a highly vulnerable population towards HIV/AIDS contraction, which if not tackled genuinely will lead to a diseased society suffering from the most stigmatized disease of the world in future. Male preponderance (2.79:1; M:F) in the study which is in accord to studies from other countries suggest that this might not be the true representation of female contracting the disease as one of the study from western Nigeria showed that proportion of females visiting to virology clinic was 67.2% as compared to 32.8% male. This justifies the fact that there is utmost need of women empowerment ranging from financial to gender equality regarding access to health care facilities. High proportion of married subjects in the study which is also seen in studies from other part of the country, with heterosexual route the most common concludes the high risk behavior of male in studied population and their role in putting the health of their female partner on stake of contracting the

disease. The fact is being justified from the high mean CD4 count of the female as compared to male suggesting that most of the female acquired their infection through their husband and high CD4 values among this female is an indirect indication of later contraction of infection by females. The spectrum of opportunistic infections has a similar presentation with data from other part of the country with tuberculosis being the second commonest opportunistic infection (33.63%) strengthening the high prevalence of fever, cough and weight loss in the studied population. Study depicts a quite difference in clinical presentation and occurrence of opportunistic infections, very low Hepatitis B co infection (4.54%) as compared to 90-95% from western world, from other part of the world necessitating formulation of different set of guide lines for subjects of Indian subcontinent. This will help in better screening, early detection and prompt treatment thus increasing the quality and quantity of life-span of such patients.

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GENDER BASED BARRIERS IN ACCESSING TUBERCULOSIS TREATMENT: A QUALITATIVE STUDY FROM EASTERN NEPAL

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ABSTRACT

Introduction: Previous studies have demonstrated longer length of delays in diagnosis and treatment among men and women, especially among women experiencing longer duration of delay in accessing tuberculosis treatment. So, the study was conducted to explore responsible factors among men and women affecting longer duration in accessing tuberculosis treatment.

Methodology: Qualitative approach with FGD sessions among people from community, DOTS providers and pulmonary tuberculosis patients were conducted separately in between March 2012 to May 2012.

Results: The perception of fear, hiding symptoms, social stigmas and traditional beliefs were common among women. The study revealed that social and cultural barrier, ignorance of symptoms, home remedies, fear of stigma, access to health centre from rural areas, poor knowledge of TB signs and symptoms, beliefs on traditional healers were the common reason for the longer delays in diagnosis.

Conclusions: The findings suggested that knowledge, information, perception regarding TB among men and women were lacking, especially among females. This warrants awareness for early diagnosis and control of disease.

Key words: Delay, Gender, Nepal, Tuberculosis

INTRODUCTION

Gender refers to “the socially constructed roles, behaviours, activities and attributes that a given society considers appropriate for men and women”.¹ Globally, reported TB (Tuberculosis) is more common among men than women and affects mostly adults in the economically productive age group of 15 – 59 years.^{2,3} Though the morbidity pattern is more among males but it kills more women in reproductive age group making it the

third leading cause of death among women of age group 15 - 44 years.⁴ National TB programmes across different countries reporting high morbidity pattern of male cases may accurately reflect a greater prevalence among men, or it may be an artefact of persisting geographic, socioeconomic, cultural, and health service - related barriers that disproportionately affect timely diagnosis and treatment in women. Early diagnosis and effective DOTS strategy form the key elements of TB control programme.^{2,3} In Nepal, DOTS have been expanded to 1118 treatment centres and 3103 sub centres throughout the country.⁵ Even though, women reach to the DOTS centre through various multiple channels than men. Study from western Nepal reported patients' intricate routes starting with medical shop and various multiple providers before reaching to qualified health provider.⁶ This delay in diagnosis may lead to disease presentation at more advanced stage contributing to late sequel

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and mortality. Previous studies⁷ have defined such delays can occur at different level and majority have reported diagnosis delay between 60 and 90 days. Studies from Nepal, India, Bangladesh and from African countries had documented longer duration of delay period in accessing TB treatment among women than men.⁷ In poor countries, men has not as much barriers as women has to face due to less financial resource and weak decision power.⁸ As per individual perspective, healthcare seeking behaviour has different dimension which lands on individual's perception regarding disease and its severity, socioeconomic and socio cultural factors, extent of awareness, accessibility to health services and treatment action. So, the clear understanding of barriers in accessing TB services, especially among women is needed for the control of the disease.

METHODOLOGY

Study design

It was a qualitative study. A qualitative research - Focus Group Discussion (FGD) technique was used which involved use of in depth group discussion on gender difference to assess the gender related behaviours and attitudes towards TB and related stigmas in accessing TB treatment that results in delay of diagnosis and treatment. The FGD sessions were conducted at three selected teaching districts (Sunsari, Morang, Dhankuta) of B.P. Koirala Institute of Health Sciences between March 2012 to May 2012 in eastern Nepal. A total of three FGD sessions were carried out separately at Dhankuta, Morang and Sunsari district among three distinct groups. Participants of each group were purposive representative sample of specific population. Each FGD session consisted of 10-12 participants that included males and females together for the in depth group discussion. Separate guidelines were developed for each session.

The first session was conducted among community people (with no history of TB) at Dhankuta with the help of DOTS in charge and FCHV (female community health volunteer) at the community level. The FCHVs were included to get in depth perception regarding TB among locals. The second session was carried out among TB patients (sputum positive and negative cases under DOTS) in Morang district at NATA (Nepal Anti Tuberculosis

Association) DOTS centre Biratnagar. In each FGD above, with regard to gender homogeneity, we tried to maintain gender balance by active participation from males and females. The participants were made ease to share their experience, opinions, beliefs and suggestions on the issues of gender difference in general health seeking behaviour, knowledge, perception regarding TB and TB related stigmas, gender role in family and accessing health services for treatment. The third session was conducted at Dharan (Sunsari district) with DOTS providers (giving TB medicine on regular basis at their respected centre) to take views regarding the behavioural aspect and perception regarding TB among TB patients (men and women) coming to DOTS centre for medication. The sessions effectively brought feelings, ideas, opinions, views and beliefs from the free flowing discussion between moderators and respondents. It was helpful in getting the views and opinions of women's behavioural nature and their approach towards health. Participants for FGD were included as per their interest in taking part in discussion and were allowed to withdraw at any time. Less than 15 years of age were not included in discussion. The study protocol was approved by BPKIHS institutional ethical review board.

Data analysis

The FGD sessions were conducted and facilitated by principal investigator along with co-investigators as experts to prepare reports. The three FGDs conducted at different level were tape recorded and analysed directly after the session using thematic framework analysis.⁹ The thematic framework was constructed after proper familiarization with data by listening to the tapes several times, writing transcripts by hand, indexing and charting of the highlighted quotes from different FGD sessions and finally appropriate themes were constructed through developed pattern. The data was interpreted through actual words used and meaning, context consideration, frequency and intensity of comments and internal consistency.

RESULTS

Knowledge and health seeking behaviour

FGD conducted at community level expressed their views as they had heard of TB but they do not have

knowledge regarding TB which creates negligence in treatment seeking. For the initial symptoms, visit to other several places was common practice rather than visiting hospital or health facility centre. This included visit to pharmacy, traditional healers, private practitioners and self medication practice. When the symptoms got worse after that only they start willing to go tertiary facility centre. One of the male participants expressed his feeling as "I work outside and earn money day to day for the living of my family. If we get some type of illness we initially wait for some day to heal and try local home remedies. In our area, we still go to traditional healers for the treatment. The reason is economical constraints, and the hospitals, private centre are so expensive that we have to think twice to go there contrary to traditional healers which are comparatively very cheaper".

Participants indicated that women were more reluctant to spend money or to access modern health services for their own need. So, they were much associated with local medications or traditional beliefs secretly until the symptoms aggravate. Even after that they used to or try to hide the symptoms with a fear to get diagnosed with some disease. A male community volunteer expressed his feeling as "Women are much concerned about their family irrespective of their ill health if present. She does not have time for herself, but for family and children she has time and first one to take step forward. The husband and children always come first for her."

FGD conducted among TB patients revealed that unawareness of the symptoms recognition and negligence among women (more) and men were the delay factors for diagnosis and treatment initiation among. The presence of cough was merely a feeling of minor infection which could heal by itself. The practice of self medication and visit to drug store was common. One of the female TB patients says, "I was having cough and chest pain for long time but I did not take care of that, as I thought it is due to the work load at home that am not taking care of. I visited local drug stores for medicine as it is cheap and symptoms were relieving after taking that medicine but again used to start after leaving medication for some days. Then my family member and my husband counselled and advised me to visit district hospital for the problem".

The hospital/health centre shopping was another reason found to be in delays among TB patients. If at one centre they did not get relief for a week, they made move to another consultation either private or public centres. Thus, want of quick diagnosis and treatment at higher centres create a dilemma of wrong perceptions of tertiary level.

When asked about the cause and types of TB in FGDs among TB patients and community volunteer, they said "yo fokso ma lagney rog ho jasto (nepali)" "it is like disease of chest" but had no information on types of TB disease, its severity and occurrence but had the perception that heavy works, alcoholism, smoking or contact from others having similar illness can lead to the TB disease. The discussion concluded that people do not have the health seeking behaviour as they lack health information about symptoms and severity of tuberculosis.

According to the DOTS providers, women were much shy and hesitant to express their problem in family which gives the negative effect on their health care seeking behaviour. Even when they reach the health centre, they used to feel shy and ashamed of telling their symptoms of coughing blood. Actually they did not want to share it as they were having greater fear of TB associated stigmas.

Perception regarding TB and TB related stigmas

Discussing on, as men are diagnosed more commonly than women, view came out from community and TB participants as men work outside and do heavy works which affect their health status but women are confined to house work only so they were not exposed to the outer world. DOTS provider stated that females could not present their illness as strongly as males due to poor health awareness or limited access to the health centres. One of DOTS provider says "The knowledge regarding TB transmission is not well oriented. So, the disease continues to run in the family and is transmitted from one person to another and subsequently to surroundings".

The fear of diagnosis or social isolation was not seen among males during FGDs among community volunteer and TB patients but inconvenience to sit with other or work and marriage difficulties were the issues that were raised. Men, being bread earners

in the family and if gets infected with disease, had fear of loss of job which creates a huge responsibility on them for the family. Participants focused that females usually used to hide the symptoms or any illness present until and unless it aggravates to its much severe condition. It was the serious matter among women in delay in accessing health services due to the perception of fear of social isolation, affect in family relations or marital relations. Participants from community stated that knowing about the illness they usually did not take care for that or try to hide as married females has the priority for her family and unmarried had feeling of being get ashamed in the society. Regarding marriage problem, one male community participant told that "When he was in his village, he saw marriage proposal being rejected by female when they came to know that man is having TB. She did not want to marry a TB patient". So it is not the case with females only, males had an equal fear for that and had tendency to hide the disease.

Discussion with DOTS providers they felt that TB stigmas were still present in the community giving the negative perceptions in treatment seeking. DOTS providers stated that females used to ask to give medicine for a week or more as they did not want to come daily to the DOTS centre as they feel fear of getting recognised by some known person in the community. This tendency was commonly seen among unmarried girls as a reason for marital difficulties due to illness. The tendency of hiding the disease was seen less among males as they are not reluctant as females to share their symptoms and discuss their problems with others.

From the discussions it was ruled out that women in the society mostly in the rural areas are more stigmatized than males in treatment seeking and these types of behavioural pattern norms the delays in accessing treatment.

Gender role in the family

Communicating with community and TB participants, informant felt that in urban areas the views are changing as women are able to take decision by their own but at rural area, women are still dependent on their family. Female participants felt that men are the building block of the family, independent, socially active for accessing resources. One female TB patient expressed her feeling as "Men are bread winner

for family; his health is first to me and to be taken care of". Women were mostly dependent on their family and have limited resources, education and knowledge to access health services. One of the FCHV volunteer said that "females tend to hide the symptoms as they are sometimes not the decision makers in the family and need to take permission to go out for health check up. Before they decide to seek care, first is to recognise the symptoms or to develop health seeking behaviour among them."

The gender difference characterization such as men easily discuss their illness or other health problems among family members and decision making permits them to cut the delays, whereas shyness or hesitancy among women has made them weak to share their problem in family, and lack of health information and decision making power trigger the delays in diagnosis and treatment among them.

Suggestions from participants

Participants felt that symptom recognition, awareness about ill effects of TB should be promoted and disseminated more in rural areas. To combat the running stigmas among men and women, they expressed that social support is needed from family members, relatives, and friends. Women participation should be encouraged at the ground level and information should be discussed in more lay man and local languages with examples or pictorial display.

DISCUSSION

Focus group discussions in this study revealed that the presence of low knowledge, lack of awareness regarding TB severity and weak financial status make people to visit traditional healers or practice self medication from pharmacy which are comparatively cheaper and easily accessible than hospital. Qualitative results from western Nepal ⁶ and Gambia ¹⁰ also reported that visit to pharmacies and traditional healer as first choice. This negligence of treatment seeking among men and more among women creates the denial and concealment behaviour where they hope that symptoms will go away on their own which in turn gradually increases the severity of disease. Hence, the delay in diagnosis at advanced stage leads to increase in the number

of mortalities. A study from Tanzania ¹¹ found that patients with low knowledge were more likely to visit traditional healer and pharmacies, similar to our findings of negligence and postponing health seeking treatment. The perception of fear, hiding symptoms, social stigmas and traditional beliefs were common among women. Qualitative findings from India ¹² also reported fear of social stigmas, ignorance of symptoms, home remedies as factors for delay in accessing to health centres. Not only the individuals but also the whole family may suffer from social stigma and its negative consequences, which are harsher for the female family members. Stigma may lead to delays for both sexes in seeking care, but more so for females if the physical, geographical, and economic access to healthcare is limited which is more in context of developing countries. Females can delay longer for a number of reasons, for example not having the authoritative powers in the household, being dependent on their husbands both economically and on social issues and repressed to discuss any ill health with their family with fear of social isolation. Studies¹³ had shown that fear of social isolation from family or community is a key factor contributing to delay among women. These factors have made women socially dependent, fragile and dominated by others that influence their minimal role in decision making power in family and access to health centres for care seeking. Our above findings in the assessment of factors in accessing treatment after onset of symptoms brought important point that lack of continuing TB education, especially among private pharmacies, traditional healers, quacks, self medication practices, contribute to poor knowledge among them and therefore poor ability to recognise symptoms and suspect TB leading to reach the health centre at late stage and contributing longer delay in diagnosis. Moreover, women often ignore or hide the disease for fear of divorce or abandonment. It is imperative to improve and implement appropriate health education on TB symptoms, diagnosis, curability, and social stigma for the entire population, as well as health providers at any level, in order to reduce diagnosis delay and fear.

CONCLUSION

The knowledge, information, perceptions regarding TB among men and women were lacking, especially among females creating negligence in treatment

seeking. The information regarding TB should be disseminated to more remote areas and every effort should be made to increase women empowerment in living, decision making and developing health seeking behaviour to alleviate barriers in accessing treatment. Effective programmes like ACSM (advocacy, communication and social mobilization) by NTP can raise public awareness of the disease and treatment, address misconceptions about TB and create demand for DOTS. For the control of the disease early diagnosis is important.

ACKNOWLEDGEMENT

I would like to thank faculties and resident doctors of School of Public Health and Community Medicine for their support in study period and DOTS in charges for their co-operation in conducting discussion sessions at respected centres.

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GLOBAL HEALTH & TUBERCULOSIS: A RETROSPECTIVE STUDY

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ABSTRACT

Introduction: A retrospective study to explore the epidemiology and clinical characteristics of Tuberculosis among Saudis, migrant workers from SAARC and other nations. The objective of this study is to study the prevalence and clinical features of Tuberculosis among Saudis & other migrant workers in central Saudi Arabia.

Methodology: A Retrospective study was conducted based on the secondary data pertaining to the patients registered at Regional TB center in Buraidah Central Hospital from Jan 2005 to December 2009.

Results: A total of 355 case records were included of which 187 cases are from Saudi Arabia and remaining 168 were from South Asian countries. Cough with expectoration, fever with evening rise, loss of appetite were the chief clinical presentations. Out of the total non Saudi patients, the Indonesian patients contribute to 74 (21%) followed by Indians 39 (11%), Nepalese 12 (3.4%), Philippines & Bangladesh with 9 cases each (2.5%), and Pakistan with 8 cases (2.3%). Among the total cases, there were 341 (96%) new cases, 12 (3.4%) relapse cases and 2 (0.6%) defaulters.

Conclusion: Prevalence of TB among migrant is relatively high. Preventive measures for early diagnosis should be performed especially among migrant workers from countries with high-prevalence of Tuberculosis.

Key words: Epidemiology, Migrant, Prevalence, SAARC nationals, Tuberculosis

INTRODUCTION

Tuberculosis (TB) has troubled humankind throughout history. Tuberculosis (TB) is an ancient disease that has affected mankind for more than 4,000 years. It is a chronic disease caused by the bacillus *Mycobacterium tuberculosis* and spreads from person to person through air. TB usually affects the lungs but it can also affect other parts

of the body, such as brain, intestines, kidneys, or the spine. Although a declining trend was observed in most developed countries, this was not evident in many developing countries. Global health is now considered important for national and international security, domestic and global economic well-being. In 2011, there were an estimated 8.7 (range, 8.3–9.0 million) million incident cases (equivalent to 125 cases per 100 000 population) of TB globally.¹ *M. tuberculosis* is known to be the leading cause of death due to a single infectious agent.^{2,3 & 4} The worldwide annual incidence continues to increase in Africa with 85% new cases because of the human immune deficiency virus (HIV) epidemic, whereas it is stable or falling in all other regions.¹ Although the majority of infected individuals don't exhibit overt signs of disease, they represent a

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large pool of infection that allows for new cases to arise and have a risk of reactivation at a later time in their lives.⁶ The risk increases significantly when the immune system of infected individual becomes suppressed, such as individuals infected with HIV.^{7,8}

An accurate description of TB is difficult to obtain because of poor diagnostic facilities and reporting systems in many countries where infection is dominant.⁹ The best information available on global TB comes from the World Health Organization (WHO) with Southeast Asia holding the highest number of people infected with TB in the world.

Cases of pulmonary TB constituted 70.6% while the extra-pulmonary TB cases constituted 29.4% of the total cases in 2006.¹⁰ In addition, Saudi Arabia in general with its developmental projects is known to attract a lot of international work force from Asian and African countries where infections might be dominant. Therefore, this study was carried out aiming to determine epidemiological and clinical characteristics of TB cases among general population in Qassim region, Saudi Arabia between January 2005 and December 2009 and to provide valuable insight on pulmonary and extra-pulmonary TB. Saudi Arabia has a population of 28 million of which 8 million (28.5%) is contributed by the migrant population mainly from India, Pakistan, Bangladesh, Sri Lanka, Philippines & Egypt. The remarkable economic and social developments and the large investments in health care services over the past 20 years are expected to have a positive impact on the incidence of TB in Saudi Arabia. Unfortunately, TB control seems to be facing challenges in several regions. The high influx of workers from high burden countries and the large volume of religious visitors together with many illegal immigrants are some of the challenges. There may also be some defects in TB control strategies that need to be evaluated and improved.¹¹

METHODOLOGY

Study population and Data collection:

This study was conducted in a regional TB center in Qassim region that lies approximately at the centre of the Arabian Peninsula. It was conducted as a retrospective study based on the secondary

data pertaining to the patients registered in hospital from January 2005 to December 2009. The study got ethical clearance from the Ethics & Research Committee of Qassim University and prior permission was taken from the hospital authorities to conduct this study. Out of 400 cases, the records were scrutinized and completeness of the data available for 355 cases were included and analyzed for the present study. A total of 355 patients registered at the hospital were included in the study. The patients registered at this hospital were coming from all the parts of Al Qassim province which is a representative sample. Patients' case sheets were used as source of data. A detailed questionnaire including the information on socio economic conditions, personal history and clinical history was developed and these variables were analyzed in the study to give a clear picture of epidemiology of TB in the region. Findings were cross-checked with TB-Lab register, TB register, and TB cards of patients. Apart from demographic profile of the patients, the presenting symptoms, co-morbid conditions, diagnostic methods used and treatment regimen were also assessed. The cases were diagnosed by the medical officer of the hospital as per the WHO classification using the direct sputum examination and chest X-ray. Montoux test was also done on all the patients.

Ethical consideration and Statistical analysis:

The study was approved by the Ethics and Research Committee of Qassim University and the hospital authorities of TB regional center. Data collected through structured questionnaires is entered and analyzed using Epi_info software (CDC Atlanta). Simple proportions and percentage were used and statistical analysis was done to see the association between TB and other variables.

RESULTS

A total of 355 patients with TB and other co-morbid conditions accessing the TB services at regional TB center at Qassim comprised the study population. Of the 355 patients, Saudi ethnicity observed in 187 (52.7%) patients compared to non Saudi 168(47.3%) as shown in figure 1. Out of the total non Saudi patients, the Indonesian patients contribute to 74(21%) followed by Indians 39(11%), Nepalese 12(3.4%), Philippines & Bangladesh with 9 cases each (2.5%), and Pakistan 8(2.3%). There

were few patients from other countries like Sudan, Egypt, Jordan, Sri Lanka, Syria, Afghanistan and Morocco (including SAARC & other countries) as shown in figure 2. Among the total number of patients diagnosed with TB, 150(42 %) were males and 205(58 %) were females (table 1) with the majority of participants 154(44%) being in the age group of 16-30 years and 101(28.5%) being in the age group of 31 – 45 years as shown in table No. 2.

Nearly half of these cases 177(49.9%) are pulmonary TB, and the other half were divided between 170(47.9%) were extra-pulmonary cases and 8(2.2%) cases with both pulmonary and extra-pulmonary involvement as shown in table 3.

Patients included in this study with both pulmonary and extra pulmonary TB had various clinical presentations but they had complaints similar to the typical TB case presentation. The majority of patients 278(78.3%) were admitted with fever, 266(74.9%) had loss of appetite, 264(74.4%) had loss of weight, 196(55.2%) complaining of cough with expectoration and 128(36.2%) were presenting with chest pain as shown in figure 3. In addition there were co-morbid conditions associated like Diabetes mellitus in 36 cases (10%), and 12(3.5%) patients were suffering from lung disease and 6(1.7%) suffering from chronic renal failure.

All the cases were treated with Directly Observed Treatment Short course (DOTS) regimen prescribed by World Health Organization. Out of total 355 patients on DOTS, 168 (47.3%) patients were put under CAT I, 10 (2.8%) CAT II and 175 cases (49.3%) CAT III. There were 341(96%) new

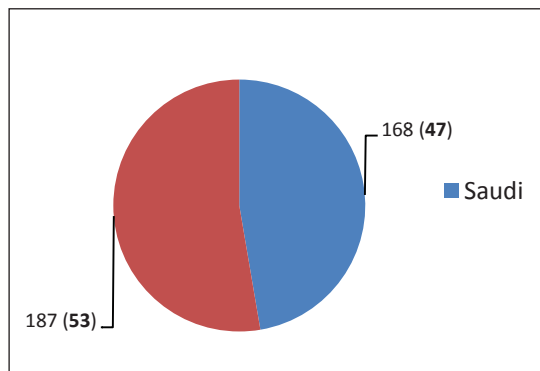


Figure 1. Ethnicity status of participants (percentages within brackets)

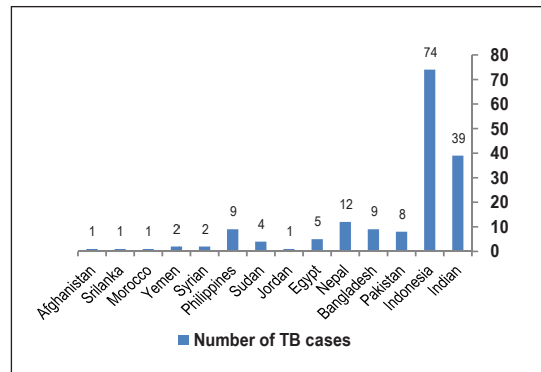


Figure 2. Ethnicity status of non Saudi participants

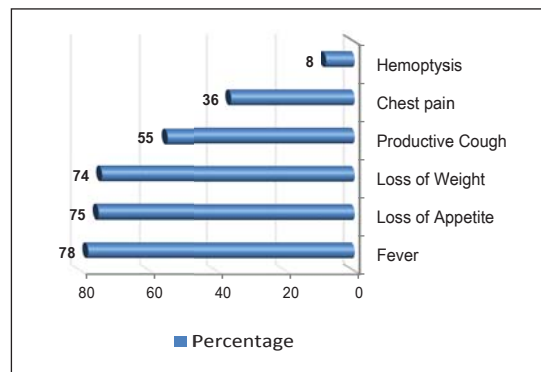


Figure 3. Distribution of common presenting complaints of TB cases

cases and 12(3.4%) relapse cases and 2(0.6%) defaulters among the total patients as shown in table 4.

Sex	Number	Percentage
Male	150	42 %
Female	205	58 %
Total	355	100 %

Age (yrs)	Number	Percentage
0 - 5	8	2.3 %
16-30	154	43.3 %
31-45	101	28.5 %
46-60	36	10.1 %
>60	56	15.8 %
Total	355	100 %

Table 3. Distribution of pulmonary & extra- pulmonary tuberculosis cases

Type of Infection	Number	Percentage
Pulmonary	177	50 %
Extra-Pulmonary	170	48 %
Both pulmonary & extra pulmonary	8	2 %
Total	355	100 %

Table 4. DOTS treatment status of the TB patients included in the study

DOTS Regimen	Number	Percentage
CAT I	168	47.4 %
CAT II	10	2.8 %
CAT III	175	49.3 %
Other	2	0.6 %

DISCUSSION

Over the last few decades, considerable effort has been expended in industrialized countries to control the spread of TB. A lot of these processes were effective initially.¹² In the USA, for instance, the incidence of TB decreased by 6% yearly.¹³ However, TB remains to be a major health concern throughout the world. It is critical for TB control and surveillance programs to address the burden of TB in certain population. Previous reports have indicated that the incidence of smear-positive TB in Saudi Arabia was estimated to be 20 per 100,000 populations.¹⁴ Neighboring countries such as United Arab Emirates have similar rate of TB incidence.

Our study provides population-based data on the TB cases in Qassim region, Saudi Arabia from 2005 to 2009. As shown approximately, 47.3% of TB cases included in this study are attributed for non Saudi patients indicating the important role that migrants play in TB epidemiology in Saudi Arabia.¹⁵ Majority of migrants were from TB-high burden countries, which is one of the important factors that contribute to resurgence of the disease. Therefore, screening migrants from countries endemic for TB is valuable to significantly reduce the spread of infection according the national guidelines.¹⁶ The high prevalence of extra-pulmonary TB in the study in comparison to overall of Saudi Arabia of 29.4% is probably due to the high number of females

immigrating to Saudi Arabia as housemaids from the TB-high burden countries.

Our data suggested that approximately 73% of subjects participated in this study belong to the age group of 16 – 45 years old proving that TB is a disease of economically productive age group among the low socio-economic strata of the society which goes in agreement with previously published study.¹⁷ Studies from South India have also shown that the prevalence of TB was higher in males than females at all ages: it was low in children under 10 years of age, increasing appreciably with age and reaching a peak between 20 and 40 years of age.¹⁸

TB symptoms and clinical presentation of the present study were typical of TB cases with the majority of patients complained of Fever, loss of appetite, loss of weight, and cough with expectoration. Though other studies conducted in Africa & Asia have documented the main presenting complaints were cough, weakness, loss of weight & loss of appetite. In this current study, most of the patients belong to the low socio economic status, who are migrants either working as daily laborers or as house maids. One study from Malawi showed that higher socio-economic status was associated with TB, probably reflecting increased awareness and hence greater likelihood of diagnosis.¹⁹ Studies from China have revealed that TB was negatively correlated with per capita income; good household economic conditions were a protective factor.²⁰⁻²¹

In our study, we found a strong association for TB in patients with chronic disease— there were co-morbid conditions associated like Diabetes mellitus in 36 cases (10%), and 12(3.5%) patients were suffering from lung disease and 6(1.7%) suffering from chronic renal failure. Few studies conducted in India and other places have demonstrated the association of TB with chronic disease like Diabetes, Hypertension & coronary heart disease.²²⁻²⁴ The positive aspect of this study was that doctors working at the Regional Hospital were following the WHO-DOTS regimen for the diagnosis and treatment of even complicated cases of TB.

In conclusion, in the current study, we examined the incidence and the pattern of TB cases registered

in Qassim TB center and the findings of this study revealed the high prevalence of TB among migrants mainly those from Southeast Asia. One of the important handicaps in TB control is late diagnosis. Pulmonary TB patients are often diagnosed many weeks after the onset of symptoms. This diagnostic delay allows for transmission of the disease to many contacts. Emphasis on timely contact tracing and treatment of those with active or latent disease is one of the most important aspects of TB control. Clinicians caring for TB patients complain of defects in this particular area. The National TB program needs to review its strategies, correct defects and improve TB control practices to make TB elimination an achievable goal. Further studies and continued surveillance of the TB infections are required to formulate plans for the effective management of TB.

ACKNOWLEDGMENT

Authors would like to thank the members of Tuberculosis Regional Center at Buraidah Central Hospital who gave their full cooperation and support for this study. Authors acknowledge the great help received from the scholars whose articles cited and included in references of this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals and books from where the literature for this article has been reviewed and discussed. Authors are grateful to SAARC editorial board members and their team of reviewers who have helped to bring quality to this manuscript.

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SPECTRUM OF CHEST X-RAY FINDINGS AMONG HUMAN IMMUNODEFICIENCY VIRUS POSITIVE INDIVIDUALS IN A NIGERIAN TERTIARY HOSPITAL

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ABSTRACT

Introduction: Human immunodeficiency virus infection damages the immune system making those affected more susceptible to opportunistic infections and malignancies which are common in the chest. This study sought to determine the pattern of chest X-ray lesions and the corresponding CD4 counts of HIV positive patients reporting in the antiretroviral clinic of this teaching hospital for the first time.

Methodology: Consecutive HIV positive patients that attended the antiretroviral clinic of the Lagos State University Teaching Hospital, (LASUTH) from September 2009 to January 2011 were recruited. Their chest x-rays were assessed for the presence of pulmonary lesions and baseline CD 4 counts were done to assess their degree of immunosuppression. Data were analyzed using the Statistical Package for Social Sciences, version 16.0.

Results: There were 211 subjects, 151 females and 60 males with a M:F ratio of 1:2.5 The mean age of participants was 36.5 ± 11.9 . Mean baseline CD4 count for the subjects was 279 ± 220.7 cells/mm³. Almost two thirds (64.9%) cases had normal chest x-rays with their mean CD4 count as 277.65 ± 228.54 cells/mm³. The commonest lesions seen in the lungs include pulmonary infiltrations, 55 (26.1%), cardiomegaly, 24 (11.4%), pulmonary consolidation, 21 (10%) and lymphadenopathy, 14 (6.6%). The commonest radiological diagnosis made were Atypical pneumonitis, 39 (18.5%), pulmonary TB, 13 (6.2%), pneumonia 13 (6.2%) and cardiomegaly 13 (6.2%) respectively. Patients with chest findings had lower mean CD4 counts, 239 cells/mm³ when compared to those without, 244 cells/mm³.

Conclusion: Pulmonary infiltration was the commonest lesion, while the commonest diagnosis was atypical pneumonitis. Patients with chest x-ray lesions were found to have lower CD4 counts with probable worse destruction of their immune system.

Key words: AIDS, CD 4 Count, Chest X-ray findings, HIV.

INTRODUCTION

Infections by the Human immunodeficiency virus (HIV) and the attendant Acquired immune

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deficiency syndrome (AIDS) have attracted the attention of various researchers globally because of the resultant high morbidity and mortality.^{1,2,3,4} AIDS has resulted in a global epidemic affecting an estimated 33.4-39.5 million people with about 2 million dying from AIDS related disease each year.^{5,6,7} Sub-Saharan Africa has the largest number of HIV infected subjects worldwide and Nigeria still has the 2nd largest number of people

living with HIV/AIDS (PLWH) in sub Saharan Africa and the highest in the West African sub region.^{3,8} The virus progressively damages the immune system making the body more susceptible to infections. The CD4 count is one of the surrogate markers for evaluating the degree of immunosuppression and HIV disease progression.⁹ The respiratory tract is often affected and patients may present with pulmonary tuberculosis (PTB) and pneumonia. Pulmonary complications are often the initial clinical manifestation of HIV infection while pneumonia and respiratory failure are the most common causes of death in the late stages of HIV infection.²

It is a well-established fact that infections and neoplasm coexist in the chest of PLWH.¹⁰ HIV infection has also contributed significantly to the resurgence of TB, especially in Sub-Saharan Africa^{11,12} and TB is the commonest opportunistic infection and an important cause of death in PLWH in developing countries. It accounts for 40% of all manifestations seen in HIV patients,^{13,14} and also accounts for 40% of AIDS death in Africa and Asia and one third of AIDS death worldwide.⁹

Pulmonary complication of HIV infection, even in the current era of potent antiretroviral therapy remains an important issue to contend with because of diagnostic challenges in our environment. Radiological imaging is a very important tool in assessing and following up PLWH and the World Health Organization (WHO) recommends the use of chest x-rays (CXR) as part of the TB screening in PLWH.^{11,14,15} This is because annual chest x-ray may be an effective, inexpensive and readily available tool especially in developing countries where access to advanced imaging is limited and which when available, is often unaffordable. The sensitivity and specificity for CXR in detecting pulmonary complications in PLWH was 98% and 93% respectively.¹⁶

This study therefore sought to determine the pattern of chest radiographic lesions and the corresponding CD4 counts of HIV positive patients reporting in the antiretroviral clinic of this tertiary institution for the first time. It is envisaged that the outcome of this study will augment the use of chest x-ray in the management of Nigerian HIV patients where there is limited availability and affordability

of the newer imaging facilities such as the CT scan. This may provide information that will help improve the management of PLWH by health care providers and possibly impact the treatment outcomes of the target population.

METHODOLOGY

A hospital based prospective, descriptive study was conducted in a 700 bedded teaching hospital in Lagos, South-Western Nigeria. Lagos has a population of approximately 17 million¹⁷ and LASUTH is the largest State referral center within this environ.

The study recruited 332 consecutive patients who had been confirmed HIV positive and required baseline chest x-ray to confirm the presence or absence of respiratory complications. Information on previous medical history was retrieved from their case notes. The study was conducted from September 2009 to January 2011 following ethical approval by the Research and Ethics committee of the hospital.

Standard postero-anterior (PA) chest X-ray images were taken in full inspiration, using a static X-ray machine, Proteus XR/a Revolution XR/d and Definium 8000 X-ray Systems (General Electric, GE) and assessed by the Radiologist using a well illuminated viewing box.

The presence of alveolar and interstitial pulmonary infiltration, lobar or pneumonic consolidation, and features of pulmonary TB, enlarged lymph nodes, pleural effusion, pleural thickening, fibrosis and cavitation with their distribution were documented.

As part of their baseline investigations in the HIV clinic, blood samples were collected and analyzed for initial CD 4 counts, using the Cyflow SL (ParterGmb, Germany). CD 4 counts were only available in 211 out of the 332 study subjects seen and therefore, only these were used in this study.

Definition of cases

Atypical Pneumonitis was defined as widespread pulmonary nodule of less than 1cm in diameter which could be uni or bilateral. Pneumonia was

defined as affection of one or more segments or lobes of the lung.⁴

Typical pulmonary TB on chest x-ray was defined as upper lobe fibrosis, bilateral infiltrates, consolidation and cavitation, while atypical cases were diagnosed when there is less cavitation, enlarged mediastinal lymph nodes, lower lobe and diffuse interstitial infiltrates.^{9,13,18,19} Miliary TB was diagnosed when bilateral multiple discrete widespread lung nodules, 1-2mm in diameter were seen.²⁰

Fibrosis was seen as discrete linear opacities. Reticulonodular lesions were defined as nodular lesions with interspersed streaky opacities giving a mesh work appearance. Plate atelectasis was seen as short horizontal linear opacities, mostly in the lung bases. Immunological status was assessed by using CD 4 counts and patients with counts < 500 cells/mm³ were classified as having immunosuppression.¹³

Data Analysis and Statistical management

Findings were entered into an excel spread sheet and subsequently into a SPSS data sheet and analysis was done using the SPSS version 16.0, Chicago Illinois. Frequency tables were generated for all variables and measures of central tendency computed for numerical variables. Chi square test and analysis of variance were used to compare means. The level of significance was set at $p \leq 0.05$ and 95% confidence interval was used throughout.

RESULTS

The age range of the study subjects was 3-90 years with a mean of 36.5 ± 11.9 . The male: female ratio was 1:2.5. Radiological diagnosis revealed that 137 (64.9%) had normal chest while 74 (35.1%) were abnormal. The CD4 counts of the study subjects ranged from 6-1246 cells/mm³, with a mean of 279 ± 220.7 cells/mm³.

Chest X-ray findings: The commonest lesions seen in the lungs were, alveolar or interstitial pulmonary infiltrations, (figure 1), 55 (26.1%), cardiomegaly, 24 (11.4%), pulmonary consolidation, (figure 2), 21 (10%) and enlarged lymph nodes, (figure 3), 14 (6.6%).

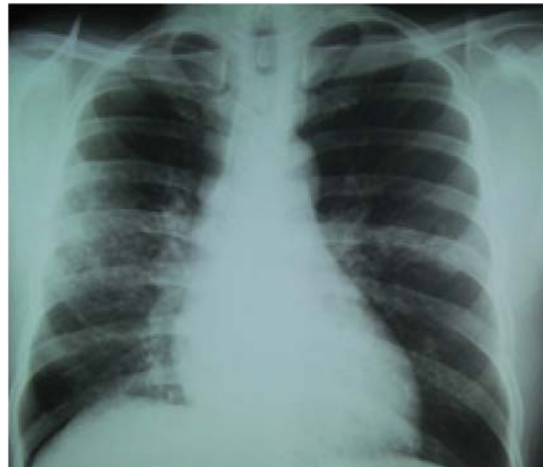


Figure 1. Postero-Anterior (PA) Chest X-Ray showing bilateral pulmonary infiltrates in the mid and lower lung zones.



Figure 2. PA Chest X-ray showing an area of homogenous lung consolidation in the right upper lobe, right hilar adenopathy and patchy pulmonary infiltrates in the right lower lobe.



Figure 3. PA Chest X-ray showing shift of the mediastinum and trachea to the right, patchy pulmonary infiltrates in the right upper lobe and right hilar adenopathy.

The right costophrenic angle and the right diaphragm is obscured which may also suggest some pleural effusion.

The lesions were seen mainly in the lower lobe, 18(24.3%), while the upper and mid lung zones were equally affected 3(4.1%). The alveolar or interstitial infiltrates and lobar or pulmonary consolidation were bilateral in 33 (44.6%) and widespread in 19 (25.6%). When unilateral, they occurred more in the right lung, (tables 1 a and 1b).

Table 1a. Abnormal Chest x-ray findings		
LESIONS	FREQUENCY	%
PULMONARY INFILTRATES	55	26.1
PULMONARY CONSOLIDATION	21	10.0
RETICULONODULAR SHADOWS	2	0.9
CAVITIES	2	0.9
FIBROSIS	4	1.9
ENLARGED LYMPH NODES	14	6.6
PLEURAL EFFUSION	4	1.9
PLATE ATELECTESIS	4	1.9
CARDIOMEGALY	24	11.4

** A combination of these lesions can occur in one participant

Table 1 b. Distribution of lesion in the abnormal Lungs		
DISTRIBUTION OF LESION	FREQUENCY	%
UPPER LOBE	3	4.1
LOWER LOBE	18	24.3
MID LUNG ZONE	3	4.1
WIDESPREAD	19	25.6
BILATERAL	33	44.6
UNILATERAL	2	2.7
RIGHT LUNG ONLY	5	6.8
LEFT LUNG ONLY	2	2.7

** More than one region of the lungs can be affected in an individual

Of those that had enlarged lymph nodes, only one was mediastinal, with most, 6 (2.8%) of them in the right hilum, 2 (0.9%) were bilateral and 3 (1.5%) were calcified. The least frequent findings

were pleural effusion, cavitation, plate atelectasis, fibrosis and emphysema, (table 1a).

Radiological Diagnosis showed that almost two thirds of the study subjects had normal chest x-rays. A radiological diagnosis of atypical pneumonitis in 39 (18.5%), (figure 4), suspicious of pulmonary tuberculosis, (figure 5) was made in 13 (6.2%), cardiomegaly and Lobar pneumonia in 6.2% each, (table 2).



Figure 4. PA Chest X-ray showing widespread, bilateral, ill defined, pulmonary infiltrates suggesting atypical pneumonitis with coexisting bilateral pleural effusion. Note the ground glass appearance in the right lower lobe.



Figure 5. PA Chest X-ray showing bilateral widespread patchy pulmonary infiltrates interspersed with streaky fibrotic shadows and suggestion of a perihilar cavity. These features are highly suggestive of pulmonary tuberculosis.

RADIOLOGICAL DIAGNOSIS	FREQUENCY	%	MEAN CD 4 COUNT cells/mm ³		p VALUE
			Subjects who had positive radiological diagnosis	Subjects who had negative radiological diagnosis	
TB	13	6.2	217.00	283.09	0.297
PNEUMONIA	13	6.2	234.00	281.97	0.449
ATYPICAL PNEUMONITIS	39	18.5	281.44	278.47	0.940
CARDIOMEGALY	13	6.2	379.38	272.42	0.091
EMPHYSEMA	1	0.5	490.00	278.01	0.339
PLATE ATELECTESIS	2	0.9	127.50	280.46	0.330
CONGESTIVE CARDIAC FAILURE	1	0.5	189.00	279.44	0.684

Generally, the mean CD 4 counts were relatively lower in patients with pulmonary manifestations. The mean CD 4 counts in subjects that had cardiomegaly, reticulonodular shadows, and emphysema was the highest while those with unilateral lesions had the least CD4 count, (table 3).

CHEST X-RAY FINDING	MEAN CD4 COUNT cells/mm ³		p VALUE
	Subjects who had the stated lesions	Subjects who did not have the stated lesions	
LESIONS SEEN			
Pulmonary Infiltrates	258.55	286.23	0.425
Lobar Pneumonia	251.05	282.11	0.542
Plate Atelectesis	236.50	279.84	0.698
Pleural Effusion	270.00	281.62	0.911
Reticulonodular shadows	305.70	278.50	0.807
Fibrosis	190.00	278.50	0.190
Emphysema	490.00	278.01	0.680
Cavity	233.00	279.45	0.768
Enlarged Lymph nodes	278.00	279.09	0.986
Cardiomegaly	318.75	274.60	0.620
DISTRIBUTION OF LESIONS			
Upper Lung zone	227.33	279.76	0.684
Lower Lung zone	246.89	280.97	0.539
Middle Lung zone	291.67	278.83	0.921
Widespread	252.42	281.65	0.583
Right Lung	171.40	281.63	0.271
Left Lung	215.00	279.63	0.681
Unilateral	81.00	280.91	0.203
Bilateral	257.73	282.96	0.548

The study therefore showed that the commonest chest imaging findings in HIV antiretroviral naïve patients were atypical pneumonitis, tuberculosis, pneumonia and cardiomegaly and that lesions of pulmonary TB, atypical pneumonitis and pneumonia were overlapping and cannot be readily differentiated from each other which could result in delayed diagnosis treatment.

DISCUSSION

More females than the males were infected with the HIV in this study. This is similar to the findings in Tanzania by Nwogi et al.¹³ Females are more vulnerable to HIV infection than males because of their biological make up, and socio-cultural factors such as polygamy and prostitution. Contrarily however, other studies in Nigeria and Cuba found that more males were infected in their studies.^{9,21}

The fact that more of the chest x-rays in this study were normal does not however rule out chest pathologies in these patients. Hollermann et al¹⁰ and Yoo et al²² had earlier reported in their studies that the chest x-ray may be normal in HIV positive patients with Pneumocystis carina pneumonia (PCP) and TB. The absence of radiographic findings in many of the cases in the present study may also represent the early stages of the disease.

The conventional chest x-ray (CXR) is usually the first line and often only imaging investigation for HIV patients suspected for respiratory complications.⁴ Despite the variety of differential diagnoses, overlapping features, atypical manifestations and multifactorial disease, the CXR is accurate for diagnosing common chest complications, with reported accuracies of 64%, 75% and 84%

for diagnosing bacterial pneumonia, PCP and Microbacterium Tuberculosis (MTB), respectively, in a blinded trial.⁴

The present study agrees with Allen et al⁴ who reported that limitations reflecting overlapping appearances, atypical manifestations and coexisting disease contribute to a relative lack of specificity of imaging. However, certain basic radiographic patterns can be recognized, which should raise the suspicion of certain underlying disease process.⁴

A report by Allen et al in clinical radiology identified bacterial pneumonia as the most common cause of focal consolidation in AIDS.⁴

In the present study, about one third (35.1%) of the chest radiographs showed abnormalities which was much less than was found by Janzen et al.¹⁶ This may be because their patients, though immunocompromised were not HIV positive. The chest lesions found in this study include pulmonary infiltrates, more at the lower lobes and bilateral, with enlarged hilar lymph nodes as the predominant features. There were few cavitations. Pulmonary infiltrates was the most common lesion in the present study similar to the study by Janzen et al, while the commonest radiological diagnosis by Janzen et al was TB which correlates well with findings in some African and some centers in some Western countries.¹⁶ This was however contrary to what was found in this study where TB occurred only in 6.2% cases. The difference might be because Janzen et al's study was amongst immunocompromised subjects who were HIV negative.¹⁶

The abnormal chest radiographs in this study, predominantly atypical pneumonia was contrary to findings by Boiselle et al²³ which reported that bacterial pneumonia was the most common diagnosis. Unlike the study done in Ethiopia in 2011² where pleural effusions are said to be a common finding in HIV patients, it was one of the least common finding in this study. This study was however contrary to Assefa et al's¹⁹ study which claimed that Pulmonary tuberculosis (TB), bacterial pneumonia (BP) and Pneumocystis

pneumonia (PCP), account for the major causes of pneumonia-like syndromes seen in HIV-AIDS patients.

Our findings however differed greatly from the study done in Calabar, South East Nigeria; by Peters et al²⁴ where it was found that lung consolidation was the commonest respiratory sign as seen in 44 % of the cases. Hilar lymphadenopathy was seen in (35%), but it was much less, 6.6% in the present study. However, pleural effusion (32%) and lung fibrosis (21%) in their study were amongst the least common findings in this study.

More people in the developed world are also contracting TB because their immune systems are compromised by AIDS, immunosuppressive drugs and substance abuse.¹² Between 30-40% of AIDS patients in the world have been found to have coexisting TB.¹² Microbacterium TB (MTB) is the most common pulmonary complication of HIV worldwide.^{4,11,12,13}

The radiographic appearance of TB in AIDS differs from that in immune competent hosts, with more diffuse and lower zone disease, miliary disease and adenopathy as well as an increased incidence of a normal CXR.⁴ Nearly half (41.2%) of our study subjects were suspected to have TB on presentation. This was much less than the findings by Reyes et al²¹ where pulmonary tuberculosis was the form of presentation in 79.2% of patients. The chest radiographic findings suggesting TB include characteristic upper lobe infiltrates, cavitary lesions with hilar and perihilar opacities.¹¹ In the study by Hollermann et al¹⁰, atypical or primary pattern of TB was common in patients with CD4 less than 200 cell/mm³, while typical or post primary pattern was common in those with CD4 greater than 200 cell /mm³ (p=0.02).⁹ The same observations were also made among African and American patients in whom there was significant association between low CD4 count and atypical or primary pattern of tuberculosis.⁹ The lower the CD4 count the more the tendency for the chest radiograph findings to be different or atypical.^{19,25}

The characteristics of the pulmonary infiltrates and few cavitation that were found in this study is contrary to the findings of much cavitation by

Nwonwueu¹¹ and Desalu et al in the south-eastern part of Nigeria.⁹

At CD4 levels above 400, patients are at risk of infection from relatively virulent organisms, such as bacteria and TB. Lung cancer may also occur at this stage. Between counts of 200 and 400, patients may suffer from recurrent infection as well as lymphoma. Opportunistic infections and Kaposi sarcoma (KS) are rare at CD4 levels >200 and indeed most cases of PCP occur at CD4 counts below 100, along with Mycobacterium avium complex (MAC), fungal infections and Cytomegalovirus (CMV).⁴ Nyamande et al³ claim that the lower the CD4 count, the greater the likelihood of both opportunistic and non-opportunistic pulmonary infections. This was corroborated by the present study.

Patients in this study with mean CD4 count greater than 200 cells/mm³ had hilar lymphadenopathies. The only patient with mediastinal lymphadenopathy had a CD4 count that was much less than 200 cells/mm³ (30 cells/mm³) similar to the claims by Desalu et al⁹ and other studies. The few subjects who had cavities on the chest radiographs in the present study were more immunosuppressed than those who did not have, contrary to findings from previous studies⁹.

Though the level of immunosuppression were shown to be clinically related to the radiographic manifestation, the CD4 count of the study subjects had no statistically significant correlation with the radiological findings in this study ($p > 0.05$). This is in agreement with results in the study by Desalu et al.⁹

Opportunistic lung infections are said to be commoner at CD4 count levels below 200 cells/mm³ and this may be responsible for the respiratory findings.¹⁹ However in the present study the mean CD 4 count was 279 ± 220.7 cells/mm³. This might explain why the diagnosis of TB was much less compared to previous studies.

The radiological findings of cardiomegaly in this study, is similar to the findings in Tanzania where 72% of the study subjects had cardiomegaly from pericardial effusion.²⁶ Pericardial effusion is strongly associated with and is an early manifestation of

HIV infection in Tanzania.²⁶ Janda et al also found cardiomegaly and pulmonary arterial enlargement as predominant chest x-ray findings in their study.²⁷

With longer survival, cardiovascular complications are becoming manifest in HIV patients and they include cardiomyopathy and pulmonary arterial hypertension.⁴ The cause of cardiomegaly in this study could not however be ascertained because the past medical history was not fully known as information was retrieved from the case notes.

Adenopathy is also most commonly due to infection.⁴ TB is by far the most common cause, accounting for about 85% of the cases.

The majority of pleural effusions in AIDS are small, occurring with equal incidence in both infection and malignancy.⁴ Pleural effusions were said to be less frequent, usually unilateral and occupying less than one-third of the hemi-thorax²⁵, similar to what was observed in our study. There is a higher incidence of pulmonary emphysema among HIV-positive smokers.⁴ This may explain why it was one of the least common finding in this study.

CONCLUSION

The commonest diagnosis made in this study was atypical pneumonitis, pulmonary tuberculosis, pneumonia and cardiomegaly. Patients with chest X-ray lesions were found to have lower CD4 counts with probable worse destruction of their immune system. The difference in the mean CD4 count of those with and those without chest lesions were however not statistically significant ($p > 0.05$).

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HIGH RISK OF IMMUNE RECONSTITUTION INFLAMMATORY SYNDROME DEVELOPMENT AMONG PEOPLE LIVING WITH HIV/AIDS IN FAR-WESTERN REGION OF NEPAL

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ABSTRACT

Introduction: Absolute CD4+ cell counts and CD4/CD8 ratio continue to be an important marker for clinical management of human immunodeficiency virus (HIV) infection and diagnosis of AIDS. CD4/CD8 ratio has been also used for prediction of immune reconstitution inflammatory syndrome (IRIS). The objective of the study was to determine the immunological status in HIV infected people taking anti retroviral therapy (ART) on the basis of CD4+ level and to assess the risk of development of (IRIS) on the basis of CD4+ /CD8+ ratio.

Methodology: The study was carried out at Antiretroviral Therapy Centre of Seti Zonal Hospital (SZH), Dhangadi in Western region of Nepal; the second biggest ART center. The study included 760 HIV infected heterosexual, migrant laborer to India from Nepal and their spouses and children. CD profile was enumerated by FACS Count System.

Results: Out of 760, 33(5%) had normal (between1-4) CD4/CD8 ratio, 727 (95%) had abnormal ratio (less than1) of CD4/CD8. The chance of getting IRIS after ART treatment initiation in HIV infected people was 47% among which 30% found to be in high risk of getting IRIS (having CD+/CD8+ ratio less than 0.15) and 17% had chance of immune reconstitution inflammatory syndrome (IRIS) in future course of treatment (having CD+/CD8+ ratio between 0.15-0.30).

Conclusion: The study provides the first baseline data on CD4, CD8, and CD4+/CD8+ ratio in HIV infected people in far-western region of Nepal and will sensitize the clinician about the risk of developing IRIS during ART treatment. Furthermore no test is currently available to establish a IRIS diagnosis. Standardized disease-specific clinical criteria for common infectious manifestations of the disease should be developed.

Key words: IRIS, CD4, HIV, Nepal

INTRODUCTION

Absolute CD4+ cell counts and CD4/CD8 ratio continue to be an important marker for clinical management of human immunodeficiency virus (HIV) infection and diagnosis of AIDS. CD4/CD8

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ratio has been also used for prediction of immune reconstitution inflammatory syndrome (IRIS).¹ The development of IRIS in HIV-infected patients initiating antiretroviral therapy (ART) results from restored immunity to specific infectious or non-infectious antigens. A paradoxical clinical worsening of a known condition or the appearance of a new condition after initiating therapy characterizes the syndrome. Potential mechanisms for the syndrome include a partial recovery of the immune system or exuberant host immunological responses to antigenic stimuli. Despite numerous descriptions

of the infectious and noninfectious causes of IRIS, the overall incidence of IRIS is unknown, but is dependent on the population studied and its underlying opportunistic infections burden. The infectious pathogens most frequently implicated in the syndrome are *Mycobacteria*, *Varicella zoster virus*, *Herpesviruses*, and *Cytomegalovirus* (CMV).¹ In Nepal, the estimated number of people living with HIV is over 75,000 and as of 12 April 2008, 11,234 HIV cases were reported by official data of National center for AIDS and STD control (NCASC).² Studies to date are often retrospective and focus on specific manifestations of IRIS, such as tuberculosis-associated IRIS (TB-IRIS). In a large retrospective analysis examining all forms of IRIS, 33/132 (25%) of patients exhibited one or more disease episodes after initiation of ART.³ Other cohort analyses examining all manifestations of IRIS estimate that 17–23% of patients initiating ART will develop the syndrome.⁴⁻⁶ Another large retrospective study reported 32% of patients with *M. tuberculosis*, *M. avium* complex, or *Cryptococcus neoformans* co-infection developed IRIS after initiating ART. Risk factors identified for the development of IRIS in one cohort included male sex, a shorter interval between initiating treatment for OI and starting ART, a rapid fall in HIV-1 RNA after ART, and being ART-naïve at the time of OI diagnosis.⁷ Other significant predictors have also included younger age, male sex, a lower baseline CD4 cell percentage, a lower CD4 cell count at ART initiation, and a lower CD4 to CD8 cell ratio at baseline.^{3,4} Since cohorts differ substantially in study populations and the type of IRIS (i.e. TB-IRIS only) examined varies conclusions regarding risk factors for IRIS become difficult. In these patients, clinical deterioration occurs despite increased CD4+ T lymphocyte counts and decreased plasma HIV-1 viral loads.³ Case reports of some patients initiating ART describe unique symptoms during immune system recovery thus expanding the clinical spectrum of the syndrome. Because clinical deterioration occurs during immune recovery, this phenomenon has been described as immune restoration disease (IRD), immune reconstitution syndrome (IRS), and paradoxical reactions. Given the role of the host inflammatory response in this syndrome, the term

immune reconstitution inflammatory syndrome (IRIS) has been proposed and has become the most widely used and accepted term to describe the clinical entity.

The CD4/CD8 ratio is a reflection of immune system health. A normal ratio is between 1 and 4. People without HIV infection generally have a greater number of CD4 cells than they have of CD8 cells. As people get older, the immune system defense against pathogens is weaker and the CD4/CD8 ratio tends to decrease. People with autoimmune diseases tend to have an increased CD4/CD8 ratio, while those with viral infections have a decreased ratio. Within six months of HIV seroconversion, the CD4 count generally decreases about 30% and the CD8 count may increase by about 40%, resulting in an inverted ratio that is generally less than 1. With antiretroviral treatment, the ratio may revert toward normal. Long-term non-progressors and those who start antiretroviral treatment early on generally have a normal CD4/CD8 ratio. Factors affecting CD4 count and subsequently the CD4/CD8 ratio are some viral infections, tuberculosis, corticosteroid use, seasonal/diurnal variations, and variations in CD4 analyses.

Although not too much attention is paid to ratios now, one study found that the only independent predictors for immune reconstitution inflammatory syndrome (IRIS) were a low baseline CD4 count and a low CD4/CD8 ratio. People with a CD4/CD8 ratio of less than 0.15 were more likely to have an IRIS event than were people with a ratio greater than 0.30.⁸

To date, no prospective therapeutic trials concerning the management of IRIS have been conducted. All evidence regarding the management of IRIS in the literature relates to case reports and small case series reporting on management practice. This does not provide reliable evidence regarding either the safety or efficacy of these approaches, but merely guidance regarding the practice of others in managing this difficult condition. In severe cases where the discontinuation of ART is a possibility, the potential disadvantages of therapy cessation, such as the development of viral resistance or AIDS progression, should be considered.

METHODOLOGY

A descriptive study was carried out at ART centre of Seti Zonal Hospital (SZH), Dhangadi in Western region of Nepal; the second biggest ART center. After taking informed consent, information regarding age, sex, mode of transmission was recorded in the register. HIV was diagnosed by Tri dot method. This research was a routine part of Hospital program, funded by Family Health International (FHI). All the information obtained from Laboratory reports, hospital records and direct communication with patients were entered into SPSS program software and analyzed to obtain cluster differential profiles of the patients. The study included 760 HIV infected heterosexual and migrant laborer to India from Nepal and their spouse and children. FACS Count System was used cell count. The study was conducted from December 2006 to November 2007. The ethical aspect was taken care by keeping anonymity of the individual and taken approval from institutional ethical committee. The data was analyzed using SPSS software.

RESULTS

The majority of the study subjects (75%) were between 26-45 years and 65% were females. There were 9% children and 6% over 46 years. The 32% HIV infected people having CD4 count less than 200 cell/ml were on ART treatment, 45% were found with borderline levels (CD4 count between 200-500 cells/ml) and may need ART in near future and 9% of HIV infected people had CD4 counts within the normal range. Out of 760, 33(5%) had normal (between 1 - 4) CD4/CD8 ratio, 95 % had abnormal ratio(less than 1) of CD4/CD8. The chance of getting IRIS after ART treatment initiation in HIV infected people was 47% among which 30% were at a higher risk of getting IRIS (having CD+/CD8+ ratio less than 0.15) and 17% had chance of developing IRIS in future with the initiation of treatment (having CD+/CD8+ ratio between 0.15-0.30).

Table 1. Gender wise distribution of people infected with HIV/AIDS in Far Western Region of Nepal

Gender	Frequency	Percent
Female	492	65
Male	268	35
Total	760	100

Table 2. Age group of people infected with HIV/AIDS in far western region of Nepal

Age Group (Years)	Frequency	Percent
Children (below 14)	70	9
15-25	82	11
26-35	347	45
36-45	217	29
> 46	44	6
Total	760	100

Table 3. CD4+ count of people infected with HIV/AIDS in Far Western Region of Nepal

CD4+ count	Frequency	Percent
<200	245	32
200-500	347	45
501-750	108	14
751-1000	34	5
>1000	26	4
Total	760	100

Table 4. Ratio of CD4/CD8 status in people infected with HIV/AIDS in far western region of Nepal.

Ratio of CD4/CD4	Frequency	Percent
Between 1- 4	33	5
Less than 1	727	95
Total	760	100

Table 5. CD4+/CD8+ ratio of people infected with HIV/AIDS in far western region of Nepal

CD4+/CD8+ ratio	Frequency	Percentage
Less than 0.15	126	17
Between 0.15-0.30	230	30
More than 0.30	404	53
Total	760	100

DISCUSSION

The study sample showed a female preponderance (two-third) among people infected with HIV. Most of the infected population belonged to age group (15-45), along with children. One third of population were in acute need of ART therapy according to the past WHO recommendation (CD4 count <200) and this proportion would increase further if new WHO guidelines (CD4 count <350) were adopted. Out of 760, 33(5%) had normal (between 1 - 4) CD4/CD8 ratio, 95 % had abnormal ratio (less than 1) of CD4/CD8. This study has thrown light on the extent of the problem of IRIS in Nepalese HIV infected people with 47% having the chance of getting IRIS after ART treatment initiation. Further, among which 30% were at a higher risk of getting IRIS (having CD+/CD8+ ratio less than 0.15) and 17% had chance of immune reconstitution inflammatory syndrome (IRIS) in future course of treatment (having CD+/CD8+ ratio between 0.15-0.30).

Florence E. et al. identified several risk factors for the development of IRIS, including younger age at initiation of HAART, lower baseline CD4 cell percentage or CD4:CD8 ratio, and, to a lesser extent, higher baseline CD8 cell percentage. Older age has been identified as a risk factor for a suboptimal CD4 cell response and discordant CD4 cell and virological responses to HAART.⁹ As a result, younger age at initiation of HAART is likely to result in greater immune restoration and, therefore, an increased risk of developing IRIS.^{9,10}

Breton F. et al and Martinez E. et al. in two recent studies of patients with predominantly mycobacterial disease^{11,12} found that IRIS was associated with a higher CD4 cell percentage and CD4%:CD8% ratio and a more marked and persistent reduction in viral load.¹² This disparity in findings may be explained by differences in the relative frequency of various IRIS events across studies and in the frequency of CD4 cell count and viral load monitoring, whereby the reported CD4 cell counts at event or at 12 weeks after HAART initiation were often based on CD4 cell counts up to 8 weeks before or after this time point. Resolution of this can only be achieved by undertaking large prospective studies with T cell subset measurement

at baseline and monthly for at least 6 months. They found that a higher CD8 cell percentage (>65%) at baseline and at 12 weeks (as well as a lower CD4:CD8 ratio) was associated with 3-fold increase in risk of IRIS, although this was no longer significant after adjustment for CD4 cell percentage. But, in another study of mycobacterial IRIS, there was no such association with IRIS.⁵⁶ This suggests that the pathogenic mechanisms associated with IRIS may differ according to the type of pathogen. In contrast, an enhanced CD8+ cytotoxic T lymphocyte response may be more important in the immunopathogenesis of IRIS to viral infections, such as *Herpes zoster*,^{13,14} *Cytomegalovirus*, *Hepatitis C*, or *Human herpesvirus 8*,¹⁵ although natural killer cells may also be implicated.¹⁶ More recently, distinct polymorphisms in certain major histocompatibility complex or cytokine genes in association with mycobacterial and herpesvirus-associated IRIS have been described,¹⁷⁻²⁰ which indicates a genetic susceptibility to IRIS.

CONCLUSIONS

The study provides the first baseline data on CD4, CD8, and CD4+/CD8+ ratio in HIV infected people in western region of Nepal and will sensitize the clinician of the risk of developing IRIS during ART treatment based on CD4/CD8 ratio. While exact estimates of incidence are not yet available, IRIS in patients initiating ART has been firmly established as a significant problem in both high and low income countries. Because of wide variation in clinical presentation and the widening spectrum of symptoms and etiologies reported, diagnosis remains problematic. Furthermore no test is currently available to establish an IRIS diagnosis. Standardized disease-specific clinical criteria for common infectious manifestations of the disease should be developed to: 1) identify risk factors for developing the syndrome and 2) optimize the prevention, management of opportunistic infections. Results of trials addressing the optimal timing and duration of treatment of opportunistic infections will assist in developing guidelines for the prevention and management of IRIS. Treatment of IRIS will remain a clinical challenge due to the variety of clinical presentations and the presence of multiple pathogens capable of causing the syndrome.

Until a greater understanding of the syndrome is achieved in different regions of the world, clinicians need to remain vigilant when initiating ART and individualize therapy according to known treatment options for the specific infectious agent. Patients at greatest risk for the development of serious IRIS events with a low CD4:CD8 ratio of <0.15, should be screened to exclude an active or subclinical infection with important opportunistic pathogens.

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A STUDY ON SOCIODEMOGRAPHIC PATTERN AND SIDE EFFECTS OF ANTI-TUBERCULAR DRUGS AMONG TUBERCULOSIS PATIENTS IN POKHARA VALLEY

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ABSTRACT

Introduction: Tuberculosis is an infectious disease that mainly affects the lungs. Tuberculosis is one of the leading causes of morbidity and mortality in most developing countries. The SAARC region accounts more than 32% of global burden with 0.6 million deaths every year and 2.5 million new cases annually. The main aim of our study was to determine the socio-demographic patterns among tuberculosis patients in Pokhara Valley and side effects of anti tubercular drugs.

Methodology: This study was conducted among 199 tuberculosis patients at Western Regional Tuberculosis Center, Pokhara, Nepal. These patients diagnosed as new as well as retreatment pulmonary tuberculosis cases were interviewed. Study variables such as age, gender, ethnicity, side effect encountered during the treatment, smoking and alcohol habit, socioeconomic status were statistically analyzed.

Results: Among the 199 patient enrolled, 167(84%) patients were found to have one or more side-effects. Significant relation was found between smoking and alcohol intake, socioeconomic status and disease occurrence. Prevalence of tuberculosis was higher among Gurungs. Conclusion: Socio-demographic factors also significantly influence the occurrence of tuberculosis. The side effects of anti-tuberculosis drugs are more prevalent among the age group 19 to 65 years as compared to age group of 66 years and above.

Key words: Ethnic groups, *Mycobacterium tuberculosis*, Socioeconomic status, Tuberculosis

INTRODUCTION

Tuberculosis (TB) is an infectious disease that usually affects lungs but it can also affect almost any part of the body. Tuberculosis is one of the leading causes of the morbidity and mortality in most developing countries.¹ It is responsible for the deaths occurring in the most productive age group of between fifteen and forty-nine years because

of several underlying factors. The disease can be treated and prevented if sufficient education and awareness is brought for early diagnosis and initiation of treatment. *Mycobacterium tuberculosis* (and occasionally *Mycobacterium africanum*) is the causative organisms, also known as tubercle bacilli and as acid-fast bacilli (AFB).²

The South Asian Association for Regional Co-operation (SAARC) region accounts for more than 32% of global burden of TB with 0.6 million deaths every year and 2.5 million new cases annually.³ More than 75 percent of morbidity and mortality due to the disease occur in the most economically productive age groups of 15-49 years.⁴

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In Nepal, 45% of the total population is infected with TB, out of which 60% are in the productive age group.⁵ One of the studies done using different tools like focus groups and interviews, have identified religion, socioeconomic status, level of education, and gender as possible factors associated with TB.⁶

In the context of Nepal very limited study has been done regarding the factors affecting the occurrence and treatment of tuberculosis so this study will serve as a reference for determining such underlying factors. Further, the findings of this study will be utilized by the National Tuberculosis Programme to address these factors as an interventional strategy during its future planning.

METHODOLOGY

This study was conducted at Western Regional Tuberculosis Center which was established for the prevention, treatment and control of tuberculosis in the Western Region of Nepal. Patient visiting the center between the month of May and July 2006 were selected for the study. In the study, out of 219 patients, only 199 patients were selected for the study according to the inclusion criteria.

Inclusion Criteria:

- Outpatients, pulmonary tuberculosis patients visiting the centre and willing to participate in this study.
- New or retreatment pulmonary tuberculosis patients aged 5 years and above of either sex (es).
- New or retreatment pulmonary tuberculosis patients in the continuation phase or those who have been taking medication for at least 2 or 3 months.

Exclusion Criteria:

- New or retreatment pulmonary tuberculosis patients who had just started therapy.
- Pulmonary tuberculosis patients <5 years of either sex (es).
- Patients with any other pre-existing immunodeficiency disease.

The tool used was a set of prepared questionnaire for each patient whose diagnosis was based on clinical evidences made by the doctor and/or other diagnostic test reports. All the patients were directly interviewed for the information as specified in the questionnaire. The study variables were age, gender, ethnicity, side effects of drugs, smoking habit, alcohol consumption and socioeconomic status of the patient.

The study was approved by the Department of Pharmacy, The School of Pharmaceutical and Biomedical Sciences, Pokhara University. Written consent was taken from the patients before enrolling them in the study. The collected data were analyzed using SPSS 15. Descriptive statistics and Pearson's correlation coefficient were used for analysis.

RESULTS

Among the 199 patients enrolled in the study, 167 patients were found to have one or more side effects. Among 167 patients; percentage of side effects was 36% in 19-65 age group (adult), 34% in 66 and above (elderly), and 30% in 5-18 (child). Side effects such as joint pain, ototoxicity, visual disturbance, giddiness and vertigo were predominant in the adult group. The number of female patient with the active pulmonary TB was found to be 67 and that of the male as 132. Other sociodemographic data is given in table 1. A positive correlation of 0.139 was found between degree of smoking and occurrence of TB. Similarly a positive correlation of 0.157 was found between alcohol intake and disease occurrence. The degree of association between socioeconomic status and disease occurrence was -0.34, which signifies negative correlation. Different ethnic groups like Chhetri, Newar, Gurung, Magar, Tamang and others (Thakali, BK, Rai, Lama, Sherpa, Pariyar, Nepali, Chaudhary) were in the study. Greater percentages of patients were found to be Gurung (27%), probably because this group is dominant in the Pokhara valley area of the western region of Nepal.

Table 1. Socio-demography of tuberculosis patients

Sociodemography	Categorization	Percentage
Age related side effect	1-18 yrs	30%
	19-65 years	36%
	66 yrs onwards	34%
Gender	Male	66.3%
	Female	33.7%
Smokers	Yes	74.8%
	No	25.2%
Alcoholics	Yes	61.4%
	No	38.6%
Ethnic groups	Gurung	27%
	Others	26%
	Brahmin	15%
	Chhetri	15%
	Magar	7%
	Newar	6%
	Tamang	4%

DISCUSSION

In our study we found that the prevalence of side effects was high in the adult age group. Different studies have shown that the occurrence of side effect is higher in elderly. But according to our study there is very little difference in the occurrence of side effects between elderly and adult age group. However literatures suggests that elderly people were nearly three times more likely to have adverse reactions to anti-tuberculosis drugs, six times more likely to die from tuberculosis and over twenty times more likely than younger patients to have the diagnosis made at autopsy rather than during life.⁷ Another study has shown older age as a risk factor for intolerance of anti-TB therapy where the frequency of side-effects leading to modification of treatment was 2.3% in the 0–19 yrs age group in contrast to 8.4% for those aged ≥ 60 yrs.⁸ The incidence of pulmonary TB in our study was higher for male than female. Similar was the finding in one study where incidence of pulmonary TB (58%), was higher in men than in women.⁹ There is a clear association between smoking and reduced local immunity within the lungs. In smokers, the mucous membranes of the lungs are damaged and inflamed, and the hair cells paralyzed. This effect of smoking leaves the lungs vulnerable to infection, including TB. In addition to the fact that the TB bacteria are not efficiently removed after

inhalation, chronic lung damage impairs the lung immunity and may increase susceptibility to TB. Another study reported a relative risk for heavy smokers (400 cigarettes/year) of 2.17 (95% CI 1.29 to 3.63) compared with non-smokers.¹⁰ The literatures also suggest that alcohol consumption can increase health problems and occurrence of infectious diseases. There is clinical evidence of increased incidence of infections among alcoholics.¹¹ Chronic alcoholism is associated with tuberculosis and chronic alcoholics have increased incidence of bacterial pneumonia by suppressing the immune system.¹¹ Another study shows that nearly four out of fifty patients (which accounts for 8%), developed hepatotoxicity. The incidence obtained is much higher than previous studies from USA and UK.¹² The incidence of hepatotoxicity has been reported to be higher in developing countries, and factors such as acute or chronic liver disease, poor nutrition, widespread parasitism, chronic infections, indiscriminate use of various drugs, ethnic factors, severity of the disease, chronic alcoholism or genetic predisposing may play a role individually or collectively.¹² In developing country like Nepal where 42% of the total population are below the poverty line 45% of the population is infected with TB out of which 60% are in economically productive age group of 15-49 years.¹³ Although implementation of cost effective and highly successful treatment strategy of DOTS was started in April 1996 and has already proven its efficacy in Nepal, but still 5000-7000 people continue to die of TB every year.¹³ Low socio-economic status, particularly lack of money are important risk factors for the occurrence and non-adherence to TB treatment in a poor country like Nepal.¹⁴

CONCLUSION

This study found that the productive age group is more prone to the side effects of anti-tubercular drugs. Similarly there are several socio-demographic factors such as age, gender, ethnicity, smoking habit, alcohol intake and socioeconomic status of the patient which also significantly influence the occurrence of disease. This study will also help National Tuberculosis Control Programme of Nepal to address these

factors as an interventional measure during their short term as well as long term strategic planning for tuberculosis control.

ACKNOWLEDGEMENT

The authors would like to acknowledge all technical and non technical staffs of Pokhara University and Western Regional Tuberculosis Center, Pokhara. The authors also declare that they have no conflict of interest and no funding source.

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Case Study

TUBERCULOUS TENOSYNOVITIS PRESENTING AS GANGLION OF WRIST

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ABSTRACT

Tuberculosis (TB) is still endemic in many developed countries. Involvement of the hand and wrist at presentation is extremely rare, and the diagnosis is often missed. 57 years old male presented with swelling over the left wrist since 3 years. Three swellings over dorsal aspect of the left wrist, soft in consistency, non tender, non compressible mobile at right angles to the plane of the wrist joint. ESR: 45 mm in 1 hr and rest blood investigation were normal. Ultrasonography showed Giant-cell tumor of Extensor Digitorum sheath. Xray: soft tissue swelling MRI suggestive of Extensor Tendon sheath Extraskeletal Synovial Koch's or Giant cell tumor of tendon sheath. Then planed for excision of swelling and intra-operative finding were rice bodies. Histopathological examination showed caseous necrosis with granuloma formation. Patient put on DOT1 therapy. Tuberculous tenosynovitis was first described by Acrel in 1777. Rice bodies occurring in joints affected by tuberculosis were first described in 1895 by Reise Rice bodies will be diagnosed on plain radiographs when mineralization occurs. More than 50% of cases recur within 1 year of treatment. The currently recommended 6-month course is often adequate with Extensive curettage, lavage and synovectomy should be performed. Surgery is essential, but the extent of surgical debridement is still debatable. The surgeon has to be aware of the significance of loose bodies when performing routine excision of innocuous looking wrist ganglia.

INTRODUCTION

Tuberculosis (TB) is still endemic in many developed countries. Involvement of the hand and wrist at presentation is extremely rare, and the diagnosis is often missed. Extrapulmonary tuberculosis involvement of the musculoskeletal system is uncommon, accounting for only 10% of tuberculosis (TB) cases.

CASE REPORT

57 years old male presented with swelling over the left wrist since 3 years. No history of Trauma\Fever.

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Past History: No previous history of Tuberculosis/diabetes or hypertension.

Family History: regarding Tuberculosis, or history of contact may be mentioned.



Personal History: especially occupation may be mentioned.

General Examination: Pulse - 78 beat/min BP- 128/70mmhg.

Nopallor / cyanosis / clubbing / edema / lymphadenopathy.

Local Examination: Three swellings over dorsal aspect of the left wrist. Soft in consistency, non tender non, compressible mobile at right angles to the plane of the wrist joint.

Systemic Examination:

Respiratory System: AEBE. Cardiovascular System: S1 S2 Present.

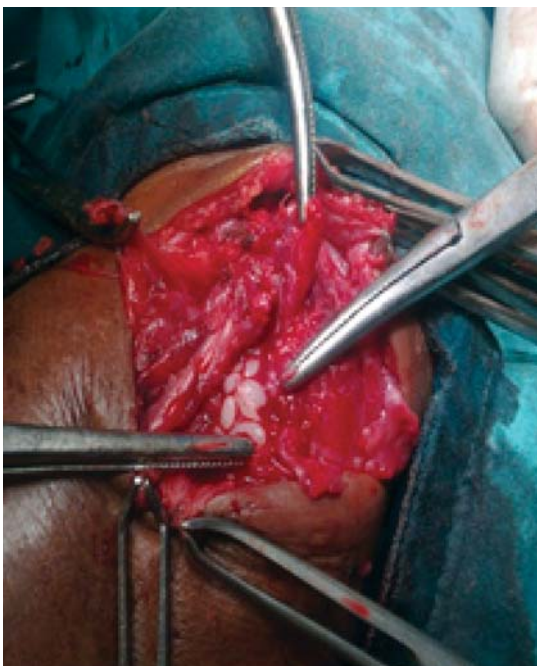
Abdominal Examination: NAD. Central Nervous System: NAD.

INVESTIGATIONS

Hb: 12gm% TLC : 8600/cmm P:65% . L: 20%. M: 03% E: 01%

ESR: 45 mm in 1 hr. Bsl (R): 95mg% BT: 01 min 5sec. CT: 04 min 10 sec.

BUN: 25mg%. S.creat: 0.8mg% USG: Giant-cell tumor of Extensor Digitorum sheath.



Xray: soft tissue swelling MRI: Extensor Tendon sheath Extra-skeletal Synovial Koch's or Giant cell tumor of tendon sheath.

X-Ray chest findings may be added if available

Intra-operative finding of Rice Bodies

Histopathological examination showed caseous necrosis with granuloma formation. Patient was started on DOTS Category I and stitches were removed on post operative day 8.

DISCUSSION

Tuberculous tenosynovitis was first described by Acrel in 1777.¹ Rice bodies occurring in joints affected by tuberculosis were first described in 1895 by Reise.² Rice bodies are a common finding in many rheumatic diseases such as rheumatoid arthritis, systemic lupus erythematosus, sero-negative arthritis, nonspecific arthritis, tuberculosis, atypical mycobacterial infections, osteoarthritic joints.³ The sheath of the tendons of the wrist and hand has been reported as a site for rice body formation. Rice bodies will be diagnosed on plain radiographs when mineralization occurs.⁴ MRI-Thickening of the synovial membrane with increased vascularization, fluid within the tendon sheath, reactive inflammation around the tendon, or swelling of the tendon.⁵ Tendon is replaced by vascular granulation tissue. Sheath is obliterated

by fibrous tissue, fluid is confined within the sheath and rice bodies form due to caseation and Tendon may consist of only a few strands of tissue and may rupture spontaneously.¹ More than 50% of cases recur within 1 year of treatment.⁶ The currently recommended 6-month course is often adequate with Extensive curettage, lavage and synovectomy should be performed. Surgery is essential, but the extent of surgical debridement is still debatable.⁷

CONCLUSION

Tuberculous tenosynovitis of wrist is rare and treatment comprises of excision of lesion and anti-tuberculous chemotherapy is the treatment of choice. Treatment for an extended period may help to minimize recurrence of disease. (NB. Concern physician is requested to consider this point for the benefit of the patient and also requested to follow up this patient during treatment and after treatment and prepare a continued paper for presentation)

The surgeon has to be aware of the significance of loose bodies when performing routine excision of innocuous looking wrist ganglia.

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Case Study

ASSOCIATION OF FOOD AND DRUG ALLERGY WITH ANTI-TUBERCULOSIS DRUG RELATED HEPATITIS OR SKIN REACTIONS: A CASE CONTROL STUDY

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ABSTRACT

Introduction: Anti-tuberculosis drugs can cause adverse reactions including hepatitis and skin reactions. This case control study was aimed at finding out whether allergy to drug or food acts as a risk factor for the development of anti-tuberculosis drug induced hepatitis or skin reactions. Patients with tuberculosis on category 1 regimen, who presented to the Teaching Hospital Kandy Sri Lanka, due to anti-tuberculosis drug induced hepatitis or skin reactions from 1st July 2010 to 30th June 2011 were recruited.

Methodology: Patients with drug induced hepatitis or skin reactions were grouped as cases and patients who didn't develop hepatitis or skin reactions during the treatment period were selected as controls. Controls were matched for age, gender, weight, and consumption of alcohol. Cases and controls were inquired for the presence of allergy to drugs or food. Two groups were compared using odds ratio.

Results: There were 61 cases [33 (54.1%) males, 28 (45.9%) females] and 61 controls. Ten patients (16.39%) among the cases had allergy to food or drugs while in control group only 2 (03.2%) had allergy. Odds ratio for the development of drug reactions in patients with a history of allergy was 5.8 (confidence interval 1.2 to 27.6).

Conclusion: Patients with allergy to drugs or foods have 5.8 times risk of developing anti-tuberculosis drug induced hepatitis or skin reaction.

Key words: Drug reactions, Hepatotoxicity, Idiosyncratic

INTRODUCTION

Tuberculosis is a global health problem with 8.8 million patients reported in 2010, and causing 1.1 million deaths in the world.¹ It is a major health burden in Sri Lanka as well, with an annual incidence of 46 per 100000 population leading to 1900 deaths in 2010.² Unlike other infections, treatment of tuberculosis requires administration of several antibiotics together for a long period of time, exposing patients to a significant risk from drug side effects. Literature provides information

that serious adverse reactions induced by anti-tuberculosis (anti-TB) drugs also contribute to the increased morbidity and mortality of tuberculosis infection. Therefore, special emphasis on adverse effects of anti-TB drugs is required in the management of tuberculosis.³

The commonest adverse reaction to anti-tuberculosis drugs is dyspepsia but hepatitis and skin reactions⁴ are 2 of the significant reactions that lead to interruption of therapy and use of alternative drugs. The rate of side effects of Anti-TB drugs has a geographical variation and higher rates are observed in India compared with the west. The incidence of anti TB drug induced hepatitis is around 9.5%⁵ in Sri Lanka but the incidence of skin reactions is not known. Hepatitis can be fatal and skin reactions can lead to exfoliative dermatitis which can be fatal as well.

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All four category 1 medications are known to cause exfoliative dermatitis.⁶ In addition side-effects such as hepatitis, dyspepsia, exanthema and arthralgia are responsible for termination of therapy in up to 23% of patients during the intensive phase.⁷

Age, gender, body weight and consumption of alcohol have been described as risk factors for the development of anti TB drug induced hepatitis.⁵ Identification of high-risk patients would be useful to allow early detection of adverse reactions and to reduce the morbidity and mortality.⁸ However, the role of drug or food allergy as a risk factor has not been studied. We noticed the increase in incidence of anti-TB drug induced adverse effects in patients with history of drug or food allergies during the past years, which prompted us to perform this study and to provide objective evidence through this study. Immune reactions have been described as mechanisms of such allergies as well as adverse reactions making a possible link between the two. This study was carried out to find out whether allergy to drug or food acts as a risk factor for the development of anti-tuberculosis drug induced hepatitis or skin reactions.

METHODOLOGY

This nested case control study was conducted in the Respiratory Unit of Teaching Hospital Kandy and Chest Clinic Kandy. This is a major referral center in the island which drains nearly a third of the population. Around 350 new tuberculosis patients are diagnosed in this center annually.

Study was carried out over a period of one year from 1st July 2010 to 30th June 2011. Ethical clearance was granted by the Ethical Committee of Teaching Hospital Kandy. Written informed consent for participation in the study was obtained from participants, or where participants are children, a parent or guardian. The consent form was approved by the above mentioned ethical committee.

Study population was the patients with tuberculosis who presented to the Respiratory Unit of Teaching Hospital Kandy and Chest Clinic Kandy due to anti-tuberculosis drug induced hepatitis or skin reactions. Out of them the patients who fulfilled the following inclusion criteria were enrolled in to the study.

Inclusion criteria

- Patients with tuberculosis who developed drug induced hepatitis or skin reactions while on Isoniazid, rifampicin, ethambutol and pyrazinamide (Category 1 regime).

Patients who met the following exclusion criteria were excluded from the study.

Exclusion criteria

- Patients on regimes other than the standard (CAT 1) regime
- Patients on long term steroids and anti-histamine
- Patients with decompensated cirrhosis and active liver disease prior to start of Anti-TB drugs
- Patients with active skin diseases prior to drug treatment
- Patients with HIV

All consecutive patients with eligible characteristics, after applying inclusion and exclusion criteria were recruited to the study. Category 1 treatment was commenced according to body weight as stated in the WHO guideline for the management of tuberculosis 2009.⁹

Definitions

Cases:

Cases were defined as the patients with tuberculosis, who fulfilled inclusion and exclusion criteria, who developed anti-TB drug induced hepatitis or skin reactions during the 6 month treatment period.

Anti-TB drug induced hepatitis:

The definition used by Rohit Singla et al was used with slight modification for our study.¹⁰

Anti TB drug induced hepatitis was defined if any one of the following 1 to three criteria were met along with criteria 4.

Criteria

1. a rise of serum aspartate aminotransferase (AST) and/or alanine aminotransferase (ALT) more than three times the normal value of

40 IU/L (> 120 IU/l) on three consecutive occasions;

2. a rise in the level of serum total bilirubin level > 1.5 mg/dl
3. increase in serum AST and or ALT two times above pre-treatment values together with anorexia, nausea, vomiting and jaundice;
4. Improvement in liver functions (serum bilirubin < 1 mg/dl, AST and ALT <100) after withdrawal of anti-TB drugs.

Anti-TB drug induced skin reactions:

Anti-TB drug induced skin reactions were defined as presence of following criteria.

1. Any rash or skin eruption with or without itching that occurs after the start of anti-TB drugs
2. Disappearance of such symptoms and signs following the withdrawal of anti TB drugs and reappearance of the same symptoms and signs when anti TB drugs were reintroduced

Food or drug allergy

Food or drug allergy was defined as documented urticaria, angioedema, skin eruption or anaphylaxis directly related to the ingestion of a particular food or drug.

Controls

Controls were defined as patients with tuberculosis on category 1 regimen, who had no exclusion criteria and who didn't develop hepatitis or skin reactions during the 6 month treatment period.

Cases and controls were inquired for the presence of allergy to drugs or food and were recorded using an interviewer administered questionnaire. Adverse reactions were managed according to WHO guideline for treatment of tuberculosis 2009⁹.

Matching

Controls were matched with cases for age, gender, weight and consumption of alcohol which are confounding factors for the development of anti TB drug induced hepatitis. One matched control was chosen for an each case.

Statistical analysis

Due to the limited study period and low incidence of adverse reactions all consecutive cases were enrolled and analyzed. Characteristics of cases and controls were compared using percentages. Incidence of anti-TB drug induced hepatitis or skin reactions were analyzed using absolute numbers as well as percentages. Food or drug allergy in each group was similarly analyzed using absolute numbers and percentages. Incidence of hepatitis or skin reaction by each drug was calculated with percentages for descriptive purposes. Strength of association between allergy and drug induced hepatitis or skin reaction was assessed using odds ratio. Confidence interval for significance was set at 95% for analysis of odds ratio.

RESULTS

A total of 122 patients were included in the study. Out of them 61 were cases and 61 were controls. Average age of cases was 47.4 (SD 15.1). There were 66 males [54.1%] (cases 33, controls 33), and 56 [45.9%] females (cases 28, controls 28). Out of 61 cases 41 (67.3%) had anti-TB drug induced hepatitis and 20 (32.7%) had anti-TB drug induced skin reactions.

Offending drug was identified during the desensitization process in 18 patients (29.5%) and all of them had to be put on an alternative regimen excluding the offending drug. All the alternative regimens had to be continued for more than 6 months. Main culprit drug out of the identified drugs was pyrazinamide which caused hepatitis in 10 patients (out of 41 hepatitis patients) (24.5%).

	Cases		Controls	
	No	%	No	%
Total	61		61	
Males (n)	33	54.1	33	54.1
Females (n)	28	45.9	28	45.9
Average age (males) years	43.75 (SD 4.5)		43.2 (SD 3.7)	
Average age (females) years	37.5 (SD 24.35)		38 (SD 4.7)	
age range(years)				
15 - 24	3	4.9	3	4.9
25 - 34	7	11.5	7	11.5
35 - 44	11	18.0	11	18.0
45 - 54	19	31.1	19	31.1
55 - 64	10	16.4	10	16.4
65 - 74	8	13.1	8	13.1
>75	3	4.9	3	4.9
Average weight (kg)	48 (SD 10.7)		47.3 (SD 11.2)	
Weight bands (kg)				
20 - 29	1	1.6	1	1.6
30 - 39	7	11.5	7	11.5
40 - 49	25	41.0	25	41.0
50 - 59	21	34.4	21	34.4
>60	7	11.5	7	11.5
Alcohol consumers	11	18.0	11	18.0

Adverse reaction	Offending drug	n	%
Hepatitis	Pyrazinamide	10	24.5
	Rifampicin	3	7.3
	Isoniazid	2	4.8
	Rifampicin+ Pyrazinamide	1	2.4
	Total		16
	Unidentified	25	61
Skin reactions	Isoniazid	1	5
	Rifampicin	1	5
	Total	2	10
	Unidentified	18	90

Out of cases 10 had past history of drug or food allergy while only 2 patients in control group had

a history of allergy [Odds ratio = 5.8 (confidence interval 1.2 to 27.6, p=0.028)].

		cases (anti-TB drug induced hepatitis or skin reactions)	controls (No anti -TB drug induced hepatitis or skin reactions)
Exposures	Presence of food or drug allergy	n = 10 (16.4%)	n = 2 (3.2%)
	No food or drug allergy	n = 51 (83.6%)	n = 59 (96.8%)

DISCUSSION

This study shows that patients with history of drug or food allergy have 5.8 times risk of developing anti-TB drug induced hepatitis or skin reactions. Although many risk factors for anti-TB drug induced adverse reactions have been described, drug and food allergy as risk factor has not been described in medical literature so far. Sri Lankan diet includes both vegetarian as well as non-vegetarian components food and drug reactions are a common occurrence in day today medical practice.

Adverse reactions to anti-TB drugs are a major concern because of their seriousness as well as the higher frequency of incidence. Most of the reactions are idiosyncratic (they cannot be predicted and not dose dependent). Isoniazid induced hepatitis is thought to be idiosyncratic and is driven by a toxic metabolite of the parent drug.⁸ The mechanism of rifampicin induced hepatotoxicity is not known but is unpredictable. Unlike in isoniazid, a toxic metabolite is not the cause. Mechanism of pyrazinamide hepatotoxicity is also not known but its effects are thought to be due to dose dependent mechanism as well as idiosyncratic reactions. Ethambutol is not known to be hepatotoxic. Incidence of hepatitis caused by each drug is difficult to assess as these drugs are used in combination.⁹

There are many mechanisms of drug allergies as well as food allergies. A significant proportion

of them are idiosyncratic. These idiosyncratic reactions are immune mediated.¹¹ Therefore it is possible that patients with drug and food allergy are immunologically susceptible to anti-TB drug induced hepatitis and skin reactions. Cross allergy between drugs have been very well described in medical literature. For example a patient with penicillin allergy could develop an allergic reaction to cephalosporin if exposed, due to cross allergy.¹² Similarly a person with allergy to one food type can have a cross allergy to other food types as well. This cross allergy could be a reason for the development of anti-TB drug induced adverse reactions in patients with drug and food allergy.

Finding of an association between drug or food allergy and anti-TB drug induced adverse reactions can have a significant impact on the management of patients with tuberculosis.

Starting anti-TB drugs in a patient with history of drug and food allergy should be a cautious procedure and special protocols on initiation of these medications on such patients are necessary to minimize reactions and to improve compliance. At the moment there is no way of predicting drug reactions. Therefore close monitoring of patients with risk factors, especially if there is a history of drug and food allergy should be practiced.

As with previous medical literature⁸ pyrazinamide was the main culprit for anti-TB drug induced hepatitis in our study. But the offending drug could be identified in only 29.5%. This makes prediction of reactions even more difficult.

All though anti-TB drug induced hepatitis and skin reactions are separate sub groups, due to the limited time frame and low incidence, the numbers were too small to do a sub group analysis. However a sub group analysis will be done in a future study to clarify the association among individual sub groups.

A cohort study will be necessary to confirm the exact causal relationship suggested in this study.

CONCLUSION

Patients with allergy to drug or food have 5.8 times risk of developing anti-tuberculosis drug induced hepatitis or skin reaction during standard regimen for tuberculosis. Therefore commencing anti-TB drugs on such patients should be a cautious procedure and special protocols may be necessary to minimize these major adverse reactions.

ACKNOWLEDGEMENT

We acknowledge all the staff members of the respiratory unit, of Teaching Hospital Kandy and Chest Clinic Kandy who helped us to make this research a success.

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