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Use double spacing throughout, including title, abstract, text, acknowledgements, references, tables and legends for illustrations. Begin each of the following sections on a separate paper. Number the pages consecutively.

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

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Below the abstract- identify 3-10 key words to assist indexers in cross-indexing the article. Non-standard abbreviations should be avoided. Generic name of the drugs should preferably be used; proprietary name may be used along with the generic name.

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INTRODUCTION

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Describe the criteria for selection of cases; identify the method/s, apparatus (manufacturer's name) and procedures in detail.

RESULTS

Present the results in sequence in the text, tables and figures. Do not repeat all the data in the tables and/or figures in the text. Summarize the important points only. Mention the methods used for statistical analysis.

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DISCUSSION

Comment on the observations of the study and the conclusions derived from it. Do not repeat the data in detail that already given in the results. Give implications of the findings, their limitations and observations to other relevant studies. Avoid unqualified statements and conclusions, which are not completely supported by the data. Avoid claiming priority. New hypothesis may be labeled as recommendations.

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Editorial

A dependable laboratory service for diagnosis and monitoring of treatment by sputum smear microscopy are key components of the Directly Obsreved Treatment Short-course (DOTS) strategy. With the expansion of DOTS, a growing demand for the high quality laboratory services is noted.

Tuberculosis laboratory networks must meet high-quality and reliable laboratory services. This will be achieved through integrating laboratory network functions with the regular operations of a National Tuberculosis Programme (NTP); implementing systematic and efficient quality assurance schemes; developing training curricula; establishing good laboratory practices , including standard operating procedures; establishing drug resistance surveillance capacity; and developing operational research capacity in various diagnostic areas.

SAARC TB and HIV/AIDS Centre identified ten Tuberculosis Laboratories in Member States as National TB Reference Laboratories. The National Tuberculosis Reference Laboratory plays an essential role in the organization and maintenance of the laboratory network..The National TB Control Programmes of SAARC Member States have developed a large net work of laboratories providing microscopy services with good access and equity. Every day in India, under the Revised National Tuberculosis Control Programme (RNTCP) more than 10,000 patients are being examined for TB, free of charge. The diagnosis of these patients and the follow up of patients on treatment will be achieved through the examination of more than 40,000 laboratory specimens. As a result of these examinations, every day, more than 2500 patients will be cured, stopping the spread of TB in the community. In order to achieve this, more than 300,000 health care workers have been trained and more than 7000 laboratory microscopy centres have been upgraded and fitted with binocular microscopes since the inception of the RNTCP.

In Bangladesh, a total of 3.02 million smears were examined in 2006. There are four culture facilities linked to the NTP, one of which exclusively undertakes research. Most of laboratories are quality assured by 33 EQA centres in the country.

A net work of 401 quality controlled microscopic facilities providing services for diagnosis and treatment follow-up have been established in the country by the government of Nepal, International, National Non Government Organizations and the private sector. In Nepal, at present there are five laboratories performing culture and two of them provide Drug Susceptibility Testing (DST).

In Sri Lanka, accessibility to diagnostic services for tuberculosis has been strengthened by establishing over 100 additional microscopy facilities all over the country. On an average, one laboratory caters currently for a population of 130,000 .In addition to providing smear microscopy services for patients referred from various hospitals, the Central Laboratory of Sri Lanka has a public health role in the following areas: External Quality Assessment (EQA) to the chest clinic laboratories, training of laboratory technicians in smear microscopy, Culture and DST facilities, involving private laboratories in the TB control programme, conducting and coordinating research.

The laboratory network in Pakistan (as of December, 2007) is composed of National TB Reference Lab -1, Provincial Reference Laboratory - 4, Regional Laboratory – 3, Intermediate Reference Level/District Level Laboratory – 112 and Peripheral Laboratories or Diagnostic Centres – 1026. External Quality Assessment (EQA) of sputum microscopy has been implemented in 41of 132 districts.

In Bhutan, 29 laboratories were performing smear microscopy in 2008 and laboratory upgradation for DST is being implemented.

SAARC TB Reference Laboratory was established with the support of SAARC Canada Regional TB and HIV/AIDS project. One of the important components of this project was to improve the accuracy in laboratory diagnosis of the respective National TB Reference Laboratories of the region. The STAC building is under construction, which will be ready by June 2010 with a hope to provide Supranational Reference Laboratory for SAARC region.

The laboratory capacity for sputum microscopy has been satisfactorily developed in the SAARC region. The SAARC Member States are working hard to develop/strengthen a net work of quality assured and accredited laboratories for Culture and DST for *M. tuberculosis*. However, there are many challenges ahead in terms of development of infrastructure and availabality of trained human resources.

A POPULATION BASED SURVEY ON HIV PREVALENCE IN NAGALAND, INDIA

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ABSTRACT

The primary aim of the present study was to determine the prevalence of HIV infection in Nagaland and to study knowledge and attitude of study participants towards HIV/AIDS and related Government programs. A population based survey was carried out during April-October, 2007. Stratified sampling technique was adopted with an anonymous, linked design for HIV testing using Dried Blood Spot Testing Method (Tri-Dot). A total of 1965 households were interviewed in which 5661 eligible respondents (male:15-54 years and female:15-49 years) completed the interview. The total individual response rate was 95.2%. Blood samples were collected from 5637 respondents. Results revealed that the prevalence of HIV was estimated to be 0.74% in Nagaland. Dimapur was identified as the only district where HIV prevalence was higher than 1%. Wokha (0.98%) and Tuensang (0.92%) also had higher prevalence compared to other districts. Knowledge of HIV/AIDS prevention methods and the services available under National HIV/AIDS program was low. Further steps therefore need to be taken to ensure higher utilization of services.

Keywords : Population based survey, HIV prevalence, Nagaland

INTRODUCTION

Human Immunodeficiency Virus (HIV) infection and Acquired Immune Deficiency Syndrome (AIDS) is posing a threat to the survival of human beings. The prevalence and magnitude of HIV/AIDS is high in countries like South Africa and Nigeria where the epidemic has affected the general population.[1] To estimate the burden of HIV/AIDS, valid data on the prevalence of HIV are required. Population based data are especially valuable as they provide generalizable unbiased estimates of health and disease outcomes in the community as a whole.[2] Often, in the absence of population based data, estimates are based on data from sentinel surveillance including antenatal clinics. Antenatal prevalence of HIV is easier to measure, can be repeated and is taken as proxy indicator of general population. However, it is evident from several studies that the estimates of disease prevalence from sentinel surveillance may differ significantly from population based data.[3,4,5,6,7]

Sentinel surveillance is being undertaken in India annually since 1998 to assess trends of HIV infection, estimate the HIV prevalence and disease burden. Though sentinel sites have been gradually increased over the years,[8,9] limited geographical coverage especially in remote, rural and hilly areas and the

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absence of data for men has raised questions on use of such data for estimating prevalence of HIV. To obtain a representative HIV estimate for Nagaland, a need was felt to conduct a population study. HIV testing under National Family Health Survey (NFHS-3) was limited to five out of six high HIV prevalence states (except Nagaland) and only one low-prevalent State (Uttar Pradesh).[10] In response to this, the NFHS Round-3 incorporated HIV testing and related issues in the survey. This led to valid and representative data on HIV prevalence and comprehensive information on knowledge and attitudes towards HIV/AIDS, high-risk sexual behavior and practices related to HIV testing in India.

The present study was undertaken to obtain a population based estimate of HIV prevalence in Nagaland, the only high prevalence state not covered under NFHS-3. Comparing the results of this survey with the sentinel surveillance data will throw some light on the true situation of Nagaland and modify future programmes. Besides, studying the level of knowledge and attitude of a population towards HIV/AIDS and services under National AIDS Control Program Phase-III (NACP-III) the study will reveal the extent to which services have reached the community.

STUDY DESIGN AND SAMPLING METHOD

The present study is a descriptive cross-sectional population based study conducted in the State of Nagaland in India. A representative sample of the general population of Nagaland aged 15-49 women and 15-54 men was selected using the stratified sampling design. Population data was collected from Census, 2001.[11] In the rural areas, samples were selected in two stages; the selection of Primary Sampling Units (PSUs), which were villages, with probability proportional to population size (PPS) at the first stage, followed by the random selection of households within each PSU in the second stage. In urban areas, a three-stage procedure was followed. In the first stage, census wards were selected with PPS sampling. In the next stage, one Census Enumeration Block (CEB) was systematically selected from each sample. In the final stage, households were randomly selected within each sample CEB.

a) Sample Selection in Rural Areas

For rural areas, based on the 2001 Census, list of villages served as the sampling frame. The list was stratified by a number of variables. The first level of stratification was based on HIV prevalence (using HIV Sentinel Surveillance, 2007)[9] with districts being subdivided into subgroups. Within each of these subgroups, villages were further stratified using following selected variables (a) total percent of male in marginal activities and non-workers (b) female literacy rate.

From this sampling frame, villages were selected systematically with probability proportional to the 2001 Census population of the village. Small villages with population of 300 or less were linked with an adjoining village to form PSUs with a population of 300 to 600. Villages with less than 50 persons were excluded from the sampling frame. Further, of each selected census enumeration blocks or villages, mapping, house-listing and enumeration of eligible population were carried out. The listing provided a necessary frame for selecting the households. The household listing operation facilitated in preparing an updated layout sketch maps of each selected PSU, assigning numbers to structures, recording addresses of these structures, identifying residential structures, and giving an identification number to each household and record other information of each household. If there were large sample villages (with more than 600 persons), they were segmented into two or more segments and one of the segment was selected randomly. In such case, household listing was carried out only in the selected segments.

The households to be interviewed were selected with equal probability from the household list in each area using systematic sampling. This method provides equal probability of selection of each household and eligible person within the household. Each survey team supervisor provided updated household listing, layout sketch map, and the list of selected households for each stratum. All the selected households were contacted during the main survey. Three attempts were made before the household was dropped. No replacement was made if a selected household was locked during the data collection.

b) Sample Selection in Urban Areas

The procedure adopted for the first stage of the sample design in urban areas was similar to the one followed in rural areas. The 2001 Census list of wards was arranged according to districts by HIV prevalence and followed by the total percent of male marginal workers and non-workers and female literacy as in rural areas. A sample of wards was selected systematically with probability proportional to size. Next, one census enumeration block, consisting of approximately 300–600 populations, was selected from each selected ward using the PPS method.

Sample size was calculated using the HIV prevalence of Nagaland at the sentinel surveillance of year 2006, with 95 percent confidence interval (CI) and coverage of 85 percent eligible population to this method. The sample size was 6000 eligible persons consisting of men in age group of 15-54 years and women in 15-49 years.

TRAINING, DATA COLLECTION AND DATA PROCESSING

i) Training : Centralized training was held to train field staff at Dimapur, Nagaland The purpose of this training was to ensure uniformity in data collection procedures in different districts. Training involved classroom sessions (including, the content of questionnaires, lectures on HIV/AIDS and family planning methods) and field practice in rural and urban areas. It also involved mapping and household listing operations. Experts from International Institute for Population Sciences (IIPS) and Consultants from National AIDS Control Organization (NACO) carried out the 5 day training.

Microbiologist from District hospital, Kohima and lab-technicians from Integrated Counseling and Testing Center (ICTCs) and Antiretroviral Treatment (ART) centers were involved in the survey to collect the blood samples and HIV testing. Training and Supervision of these staff were done by Regional Medical Research Center, Dibrugargh (ICMR). They were trained in methods of blood collection, ethical requirements, and biohazard waste disposal. Biomarker specialists from ICMR and NACO served as resource persons.
Data entry operators were trained in office editing of questionnaires, data cleaning and data entry. A separate training course of three days duration was conducted at NACO.

ii) Data Collection : Data collection was carried out in two Rounds (June-October 2007); Round I-Mapping and House listing and Round II- Household and Individual Interview.

The fieldwork was carried out by eight interviewing teams, each team consisting of one field supervisor and two interviewers. Male and female interviewers were assigned respondents of the same sex to ensure that respondents felt comfortable talking about topics that they may find somewhat sensitive. Research Coordinators were hired with the responsibility for the overall management of the field team. Supervisors were also responsible to examine questionnaires for completeness, consistency, and legibility of the information collected, and to ensure that all necessary corrections and clarifications were made while still in the field. Special attention was paid to missing information, skip instructions, filter questions and age information. If major inconsistencies were detected, the interviewers were required to revisit the respondent to rectify the inconsistencies.

In addition, research coordinators and the field supervisor conducted spot checks to verify the accuracy of key information, particularly with respect to the eligibility of respondents. NACO and Nagaland State AIDS Control Society (NSACS) officials also visited the field sites to monitor data collection operations.

iii) Data Processing : All completed questionnaires were sent to NACO through Nagaland State Control Society for editing and data processing (including office editing, coding, data entry, and machine editing). Although in field every completed questionnaire was examined, the questionnaires were re-edited at NACO by specially trained office editors.
Dried Blood Spot Testing Method (Tri-Dot) was used to collect blood samples on filter paper in the field and tested in the laboratory at Naga Hospital, Kohima.

An anonymous, linked design for HIV testing was adopted in the survey. Quality control was performed at the Regional Medical Research Center, Dibrugargh (ICMR).

Informed consent was obtained from each respondent included in the study in which participants were fully informed of the procedure and potential risks. The participation of each respondent was fully voluntary. In the case of respondent age 15-17 years, consent was taken from a parent or guardian present in the household at the time of the survey.

Data on HIV sero-positivity amongst clients of Integrated Counseling and Testing Center (ICTC) were extracted from Computerized Management Information System (CMIS) at National AIDS Control Organization to analyzed its districts-wise trends for the period 2003-2007[12].

Technical and ethical approval was obtained from the Technical Resource Group on Research and Development constituted by the Ministry of Health and Family Welfare, Government of India.

STATISTICAL ANALYSIS

Statistical Analysis was done using Epi-Info (ver. 3.5.1, 2008) and SPSS 15.0 (SPSS, Inc., Chicago, IL.USA). Univariate and bivariate analysis of socio-demographic and other variables were performed. The Pearson's chi-square test, the adjusted Mantel Haenszel's test were used to analyze the differences in the categorical data. A p-value <0.05 was considered significant.

RESULTS AND DISCUSSION

A total of 1965 households were interviewed in which 5945 were the eligible respondent (male:15-54 years and female:15-49 years). Complete information was obtained from 5661 persons with a response rate of 95.2% and blood samples were collected from 5637 (94.8%) of eligible respondents (Table 1).

Table 1: Information of Households (HH) and Respondents surveyed in Nagaland, India

	Number
HH selected	2132
HH occupied	2014
HH interviewed	1965 (RR-97.6)
HH refused/vacant/eligible respondent not found	19
HH Population	10467
Eligible respondent	5945
Eligible respondent interview completed	5661 (RR-95.2%)
Eligible respondent not at home/refused/postponed/partly completed/other	284
Eligible Male respondent (15-54 years)	3064
• Male interviews completed	2900 (RR-94.6%)
Eligible Female respondent (15-49 years)	2881
• Female interviews completed	2761 (RR-95.8%)
Blood Samples Collected	5637 (RR-99.5%)
• Blood Samples Collected-male	2887
• Blood Samples Collected-female	2750

*RR: Response Rate

The distribution of male and female respondents was similar and declining with age (P>0.05). More than 3/4th of the population belonged to rural areas. The distribution of the study population by completed number of years of education reveals that comparatively more women (14.6%) were illiterate as compared to men (6.6%). Among those who had higher education nearly 21 percent of the women have had 10 or more years of education, compared with 33 percent of men (p<0.01).

In the study population, about 46 percent of the respondents were married and living with spouse at the time of the survey. Respondents who never married accounted for 49 % of female respondents and 53% of male respondents. Majority (95%) of the male and female respondent were Christian by religion. Overall, 45 percent of study population was employed at the time of survey. Nearly 1/4th of the respondents were agricultural workers or unskilled workers. Twenty four (24%) of the respondents reported that they were away from home during the last 12 months (Table 2).

Table 2: Percentage distribution of respondent by background characteristics in Nagaland, India

Background Characteristics	Male (N=2900)	Female (N=2761)	Total (N=5661)	
Age (in completed years)				
15-19	861(29.7)	918(33.2)	1779(31.4)	
20-29	790(27.2)	836(30.3)	1626(28.7)	Chi-square=0.57; df=3; p=0.90 NS
30-39	501(17.3)	523(18.9)	1024(18.1)	
40-49	477(16.4)	484(17.5)	961(17.0)	
50-54	271(9.3)	-	271(4.8)	
Residence				
Rural	2239(77.2)	2195(79.5)	4434(78.3)	MH Chi-square=0.036; df=1; p=0.036 S
Urban	661(22.8)	566(20.5)	1227(21.4)	
Education				
Illiterate	192(6.6)	404(14.6)	596(10.5)	
Primary (1-5 years)	413(14.2)	513(18.6)	926(16.4)	Chi-square=179.05; df=3; p=0.001 HS
Secondary (6-10 years)	1351(46.6)	1277(46.3)	2628(46.4)	
Higher (above 10 years)	944(32.6)	567(20.5)	1511(26.7)	
Marital status				
Married living with spouse	1292(44.5)	1327(48.1)	2618(46.2)	
Married living alone	52(1.8)	17(0.6)	69(1.2)	Chi-square=44.86; df=3; p=0.001 HS
Divorced/Separated/Widower	31(1.1)	75(2.7)	107(1.9)	
Never married	1525(52.6)	1342(48.6)	2867(50.7)	
Religion				
Christian	2709(93.4)	2650(96.0)	5359(94.7)	MH Chi-square=18.44; df=1; p=0.001 HS
Non-Christian	191(6.6)	111(4.0)	302(5.3)	
Occupation				
Agriculture/Unskilled worker	765(26.4)	530(19.2)	1295(22.9)	
Truck/Auto/Taxi Driver/Cleaner	87(3.0)	22(0.8)	109(1.9)	
Service	562(19.4)	215(7.8)	777(13.7)	Chi-square=784.1; df=6; p=0.001 HS
Business	203(7.0)	102(3.7)	305(5.4)	
Unemployed/ Housewife	241(8.3)	942(34.1)	1183(20.9)	
Student	911(31.4)	939(34.0)	1850(32.7)	
Other	131 (4.5)	11(0.4)	142 (2.5)	

Last 12 months away from home	838(28.9)	514(18.6)	1352(23.9)	MH Chi-square=82.21; df=1; p=0.001 HS
How often away from home in last 12 months (N=1352)				
More than once a week	183(21.8)	65(12.6)	248(18.3)	
Once or twice a month	365(43.7)	166(32.2)	531(39.3)	
Once every 2 or 3 months	74(8.8)	44(8.7)	118(8.7)	
Once every 4 to 6 months	75(8.9)	28(5.4)	103(7.6)	
Once or twice a year	141(16.8)	211(41.1)	352(26.0)	

KNOWLEDGE TOWARDS HIV/AIDS

All women and men interviewed were asked if they had ever heard of a disease called AIDS. Respondents who had heard of AIDS were then asked a series of questions to ascertain the extent of their knowledge. Analysis indicates that 92 percent of the respondents (95% males and 89% females) had ever heard of HIV/AIDS in Nagaland (p<0.001). These estimates are higher than NFHS-3 particularly in females.[10] Though National Behavioral Sentinel Surveillance[13] does not provide information separately for Nagaland, it presents the combined percentages of northeastern states excluding Manipur. Results of this study are consistent with those of Manipur (92.1%) and Northeastern states (93.4%). It has been found that friends/relatives (54.9%) and posters / hoardings/ newspapers (48.9%) were the major source of information for the knowledge about HIV/AIDS (Table 3).

HIV/AIDS prevention programmes focus their efforts and messages on promoting three prevention behaviors: delaying sexual debut among young persons (abstinence), limiting the number of sex partners/staying faithful to one partner (being faithful), and use of condoms. The population based survey has also made an attempt to assess the proportion of women and men who were aware of these HIV/AIDS prevention methods (Fig.1). About 53% of respondents were aware that a condom should be used correctly every time during sex. Almost same percentage of respondents were aware of other prevention methods i.e. having one uninfected sex partner who has no other partner (58%) and abstinence from sex (57%). It is notable that knowledge about methods of HIV prevention was not found to be significant between men and women in Nagaland (p>0.05).

Table 3: Knowledge about HIV/AIDS in Nagaland, India

	Male N=2900)	Female (2761)	Total (5661)
Percentage of respondent who have heard of HIV/ AIDS	2758 (95.1)	2463 (89.2)	5221 (92.2)
MH Chi-square=68.59; df=1; p<0.001 HS			
Source of Information			
Radio	45.9	46.0	45.9
Television	36.1	33.1	34.7
Cinema	3.8	1.9	2.9
Health Workers	38.1	30.2	34.4
Spouse/Partner	2.7	5.0	3.8
Friends/Relatives	43.1	68.2	54.9
Posters/Hoardings/Newspaper	58.5	38.2	48.9
School Teacher	16.6	14.1	15.4
Other	18.5	8.8	13.9

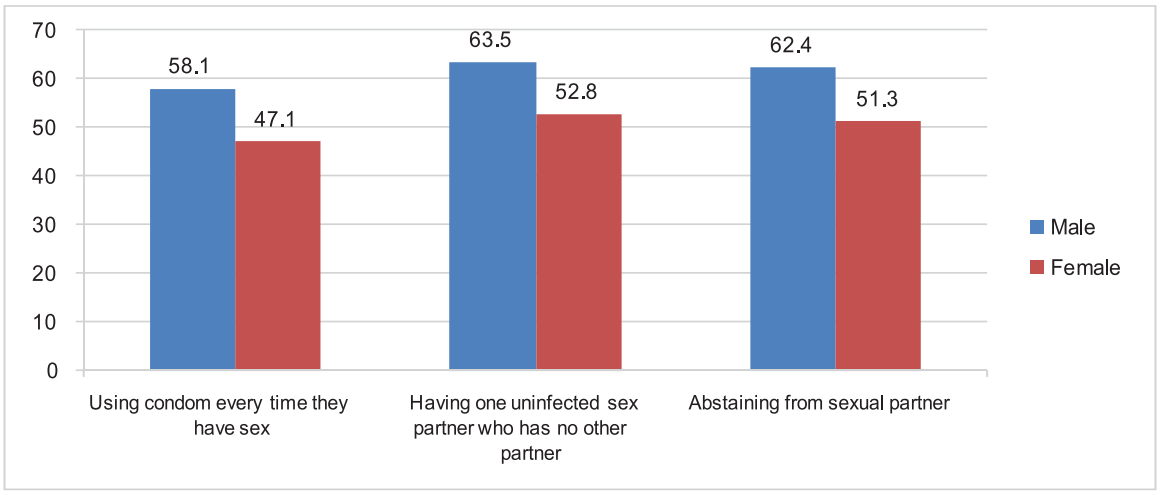

Figure 1: Proportion of respondent aware of HIV Prevention Methods in Nagaland, India

This study revealed that the larger proportions (88%) of respondents were aware that a person can get infected by getting injections with a shared needle and from the infected mother to newborn child. Knowledge regarding the transmission of virus through breastfeeding was low. In Nagaland many persons also erroneously believed that HIV/AIDS can be transmitted by mosquito bites (59.5%) and that a person can get infected by sharing food with someone who is HIV positive (72.8%). Only 54 % of the respondents had understanding that a healthy looking person could be infected with HIV (Fig.2).

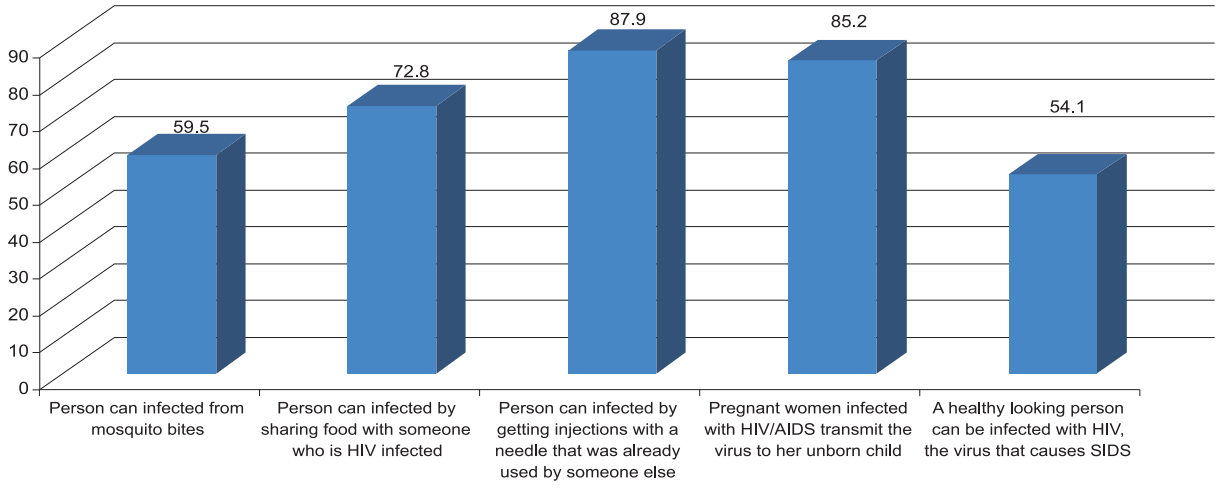

Figure 2: Proportion of respondent who are aware about HIV/AIDS and its transmission in Nagaland, India

KNOWLEDGE OF SERVICES UNDER NACP-III AND HIV TESTING

Larger proportion (64%) of the respondents was aware about voluntary counseling and HIV testing services whereas less than one third (29%) respondents were aware of STI control program. Only 45% were aware of the ART program (Figure 3).

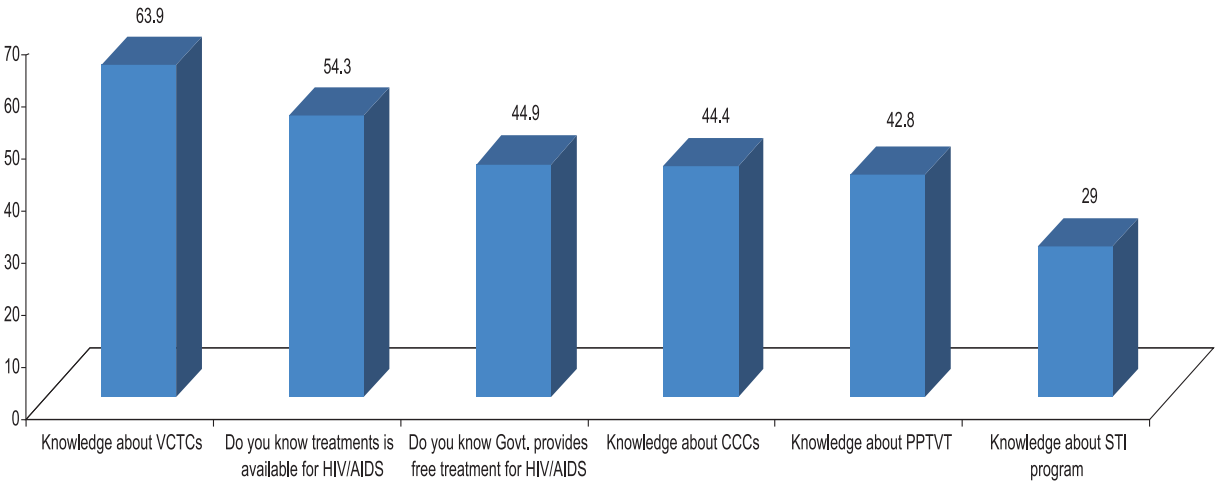

Figure 3: Proportion of respondent who are aware of HIV/AIDS program implemented by Government in Nagaland, India

One of the major challenges of the HIV prevention program in India is the ignorance and denial of HIV risk. To obtain information on HIV testing, all respondents were asked whether they had ever been tested for HIV/AIDS. Study indicates that only 10% of respondents had ever been tested for HIV. Amongst those tested for HIV during the preceding 12 months, 72% sought services at ICTCs. It was observed that post-test counseling services were sought by only 27% of those tested in preceding 12 months (Table 5).

Table 4: Percentage of respondent who had ever been tested for HIV in Nagaland, India

	Male N=2758 No (%)	Female N=2463 No (%)	Total N=5221 No (%)	Chi-square	P value
Percentage who had been ever tested for HIV	268(9.7)	266(10.8)	534(10.2)	1.66	p>0.05 NS
Percentage who had undergone voluntary HIV testing	209(77.2)	188(70.6)	396(73.9)	3.73	P<0.05 S
Percentage who were given the result of HIV test	161(59.9)	183(68.8)	344(64.4)	4.42	P<0.05 S
Percentage who had undertaken HIV testing in last 12 months	86(32.2)	132(49.4)	218(40.9)	16.26	P<0.001 HS
Percentage who received pre-test counseling	46 (53.9)	77 (59.1)	123 (56.5)	0.49	P>0.05 NS
Percentage who received post-test counseling	13 (14.6)	52 (39.4)	64 (27.1)	14.6	P<0.001 HS
Place where most recent HIV test done					
• Government hospital/ICTC	48(55.8)	116 (88.8)	164 (75.2)		
• Private clinic/Hospital	9(10.5)	12 (8.9)	21 (9.6)	39.62	P<0.001 HS
• Other	29(33.7)	4 (2.3)	33 (15.1)		

Area	PSUs surveyed	Blood samples tested	HIV+ samples	HIV+%
Rural	24	4497	30	0.67
Urban	6	1140	12	1.05

Table 5: Percentage of respondents found HIV positive in Nagaland, India			
District	Blood samples tested	Number positive for HIV	% positives
Dimapur	942	11	1.2
Mon	211	0	0
Phek	618	5	0.8
Tuensang	1192	11	0.9
Wokha	715	8	1.0
Zunheboto	991	5	0.5
Kohima	968	2	0.2
Total	**5637**	**42**	**0.7**

Based on the above results, there is a need of awareness programs to enhance knowledge of HIV/AIDS prevention methods and utilization of services made available by the State. Steps need to be taken to strengthen counseling services through refresher training of counselors and community based awareness program.

HIV Prevalence

Out of total eligible respondent interviewed (5945) in the survey, blood samples were collected from 5637 eligible (94.8%) respondent.

The prevalence of HIV was estimated to be 0.74% in Nagaland which is higher than national average of 0.36%. Though by WHO definition, it is not a high prevalence state, current efforts need to be continued to reduce the prevalence (Table 6). As it is the first population based survey in the State, trend of prevalence cannot be assessed. The prevalence rate obtained was lower than estimates made out of sentinel surveillance during 2003-2006. HIV Sentinel Surveillance, 2007[9] also indicates the prevalence among ANC attendees has lowered down to 0.6%, which was taken as a proxy indicator of prevalence in general population. This observation is in conformity with NFHS-3 results which also found over-estimation of prevalence of HIV based on sentinel surveillance data.

Based on estimates from 24 rural and 6 urban units, prevalence was found to be higher in urban areas (1.05%) as compared to rural areas (0.67%), though the difference was not statistically significant p>0.05. This finding is consistent with National estimates under NFHS-3 which shows higher HIV prevalence in urban areas (0.35%) as compared to rural areas (0.25%).

District estimates based on population based survey 2007 indicate that in majority of districts, sentinel surveillance over-estimates prevalence of HIV. This study revealed that Dimapur was the only district where HIV prevalence was higher than 1%. Based on Sentinel Surveillance, Tuensang was categorized as one of the districts with very high prevalence of HIV (>3%). However, Population based study estimated the prevalence to be 0.92% in this district (Table 7).

Table 6: District wise Prevalence of HIV based on Sentinel Surveillance and Population Based Survey in Nagaland, India

District	Rural/Urban	Sentinel Surveillance				PB Survey
		2003	2004	2005	2006	2007
Dimapur	U	1.00	0.80	1.50	2.25	1.17
	R	0.79	1.20	087	0.36	
Mokokchung	U	--	2.50	0.75	1.11	--
	R	--	0.60	1.21	0.83	

Mon	U	1.25	1.00	2.29	--	0.00
	R	16.67	0.00	--	1.37	
Phek	U	2.13	0.00	1.86	0.26	0.83
	R	7.09	0.40	0.00	0.00	
Tuensang	U	4.25	3.60	4.73	50.0	0.92
	R	--	7.07	8.36	4.07	
Wokha	U	0.82	0.70	1.00	0.61	0.98
	R	--	0.00	2.34	0.90	
Zunheboto	U	0.80	1.90	1.50	2.00	0.53
	R	0.00	0.00	0.00	0.00	
Kohima	U	1.50	1.75	1.75	1.25	0.21
Nagaland State	**R+U**	**1.13**	**0.95**	**1.50**	**0.93**	**0.74**

There was lack of consistency in trend of HIV infection based on Sentinel Surveillance in various districts of Nagaland. An attempt was therefore made to observe trends of sero-positivity from data of Integrated Counseling and Testing Centre (ICTC)13 of various districts of Nagaland. Though these data cannot be used as a measure of prevalence, they do indicate the presence of HIV virus in the population. However, the trends suggest that sero-positivity for HIV amongst clients attending ICTCs is consistently reducing in all the districts of Nagaland between 2003-2007 (Figure 4).

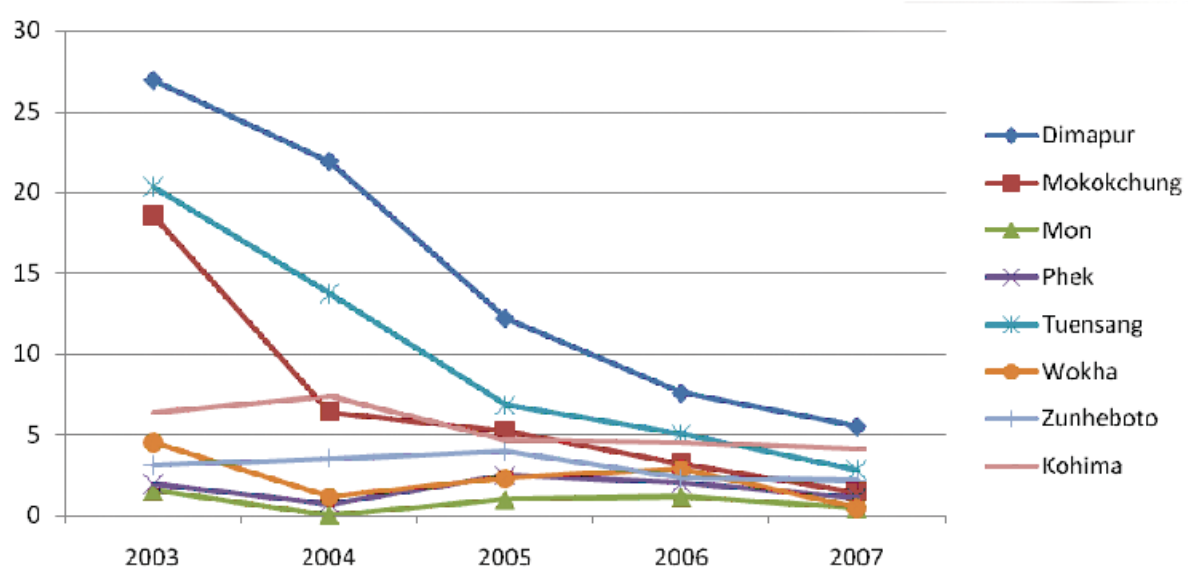

Figure 4: Trend of HIV positive cases in various districts of Nagaland, India, (2003-2007)

Source: CMIS data

Sero-positivity rates amongst ICTC clients across various districts of Nagaland show a declining trend indicating slowing down of HIV transmission. Dimapur, Kohima and Tuensang had higher sero-positivity rates as compared to other districts. Data triangulation needs to be continued further to identify hot spots in the State.

CONCLUSION

In conclusion, population based survey carried out with a representative sample and good participation rates are very useful to understand the level and distribution of HIV infection. This survey has given an estimate of HIV prevalence in Nagaland to complement information from the National Family

Heath Survey. Though population based estimates provide better quality of data, it is likely to miss many members of mobile, migrants and other groups at an increased risk of HIV. For evidenced based planning of health programmes such as prevention of mother to child transmission, antiretroviral treatment, and testing and counseling for HIV, future HIV estimates will have to be assessed from various number of data sources to get valid estimates as every methods has its own limitations. Gaps in the knowledge towards HIV/AIDS prevention and available services under National AIDS Control Program were identified and needs to be addressed to ensure higher utilization of services. After interventions are implemented, repeating the survey would help in assessing the impact of interventions on the prevalence of HIV/AIDS.

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INVOLVING FAMILY MEMBERS IN THE DELIVERY OF TB CARE IN THE KANDY DISTRICT, SRI LANKA

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ABSTRACT

Objective : To determine the effectiveness of using family members in the delivery of Directly Observed Treatment (DOT) in a local community, Sri Lanka

Method : Thirty nine TB patients detected at the Chest Clinic, Kandy between 1st of September and 31st of December 2007 were given DOT using family members (study group). Treatment outcome of the study group was evaluated in December 2008 and compared with the outcome of 42 patients, who had undergone DOT at peripheral health centres during the same period.

Results : Sputum conversion rate at the end of the intensive phase of treatment of the study group was 95% and the rate of comparison group was 88%. Treatment was successfully completed in 95% of patients in the study group and 86% of patients in the comparison group. No defaulters were found in the study group whereas 4 defaulters were in the comparison group. Observed outcome differences between two groups were not statistically significant ($p > 0.05$).

Conclusion : The present study reveals that the treatment outcome is good among patients who receive family DOT. The important prerequisites to ensure successful family DOT include correct selection of patients and DOT providers, giving adequate instruction for treatment adherence, and monitoring of the progress.

Keywords : DOTS, family DOT, Sri Lanka

INTRODUCTION

The DOTS strategy was implemented in Sri Lanka in the year 1997. By the end of 2005 The DOTS population coverage reached 97.5% (1). There has been a significant improvement in TB control during the last decade through the implementation of DOTS. The case detection and cure rates among new smear positive cases under DOTS were 84% (2003) and 83.58% (for cases registered in 2004) respectively.[1,2]

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Directly Observed Treatment (DOT) is a key element of DOTS strategy which ensures adherence of patients to correct anti TB therapy and thus ensures a high cure rate and prevents development of multi-drug resistant tuberculosis. Health care workers in the state health institutions are the main category of DOT providers in Sri Lanka. The other Programme- recommended categories of treatment providers are public health workers, general practitioners, community leaders and community volunteers.[3] However, in practice these categories do not play a significant role in providing DOT. The exclusive use of state health centre based DOT, carries certain disadvantages for patients. For example, some patients have to travel long distances

for treatment on a daily basis loosing money and experiencing physical hardships. Social stigma and loss of income have also been identified as significant problems. In many instances, patients have no other choice than to accept DOT at the nearest state health centre offered by the District Chest Clinic. Since DOT in state health centres is not always convenient for all TB patients, other possibilities of a patient centered delivery of effective treatment have to be explored.

There has been a debate among the doctors working in TB control activities about the suitability of using family members as DOT providers. However, there is no data available about the effectiveness of using family DOT in the local communities, nor the availability of proper guidelines to initiate such practice. Thus family DOT is not currently a recognized practice in the island. The aim of the following study was to evaluate the effectiveness of using family DOT in a local community.

METHOD

This study was conducted in the Kandy District, located in the Central hills of Sri Lanka. The population of the district is 1,272,500 (Census 2001) and mainly comprises of a rural Sinhalese community. The literacy rate of this population is nearly 90% and the life expectancy at birth is 71 years. The district has a good network of health care institutions in the public sector. The Chest Clinic, Kandy administrates and coordinates all TB control activities in the district. There are about 125 DOT centres located in the state health care institutions. This study was based on a comparison of treatment outcome of two treatment groups, namely, the study group (patients who underwent family DOT) and the comparison group (patients who underwent DOT at health centers).

The study group was selected using new tuberculosis patients detected between 1st of September and 31st of December 2007 at the Chest Clinic Kandy. The medical officer, who was assigned to attend on TB patients at the time of arranging DOT, was trained and given the responsibility of the selection of patients and treatment providers for family DOT, using a set of selection criteria (table 01). Both the patient and the selected family member were educated about the disease and emphasized on the value of adhering to correct treatment. Drugs for a prescribed period and the treatment card were handed over to the family member after giving adequate training on how DOT is administered. The family member was further advised to bring the patient to the Chest Clinic for review at weekly intervals during the intensive phase of treatment, and then, at monthly intervals until the treatment was completed. Meanwhile, the Public Health Inspector (PHI) of the Chest Clinic was assigned to monitor the progress of the directly observed treatment at the field level. The comparison group consisted of new TB patients who underwent DOT at peripheral health centres during the same period. These patients were reviewed monthly at the Chest Clinic while monitoring the progress of DOT in the peripheral health centres. The treatment outcome of these two groups was evaluated after a period of one year using three indicators (sputum conversion rate, treatment success rate for all TB cases and default rate). The difference observed in the outcome between the two groups was statistically tested for significance using SAS statistical software.

Table 1: - Criteria used for selection of patients and DOT providers for the family DOT

Patient	One who wishes to have treatment daily at home under the direct supervision of a family member
DOT Provider	One who lives with the patient in the same house
	Accepted by the patient as the treatment provider
	Literate and skillful
	Accountable to the health system

RESULTS

Thirty nine patients had been selected for the study group whereas the comparison group consisted of

42 patients. The mean age of the study group was 46.6 years while in the comparison group it was 39.6 years. There were 21 males and 18 females in the study group and 25 males and 17 females in the comparison group. The numbers of smear positives pulmonary tuberculosis cases were 21 and 25 in the study and comparison groups respectively (table 02).

Table 2: – Distribution of patients by the type of TB

Type of TB	Study group	Comparison group
PTB smear positive	21	25
PTB smear negative	12	12
EPTB	06	05
Total	**39**	**42**

Table 3: – Sputum conversion at the end of intensive phase of treatment

Frequency	Study group	Comparison group
Sputum converted	20	22
Not converted	01	03
Total	**21**	**25**

P = 0.6139

Table 4: – Treatment success for all TB cases

Frequency	Study group	Comparison group
Succeed	37	36
Not succeed	02	06
Total	**39**	**42**

P = 0.2666

Table 5: – Treatment compliance

Frequency	Study group	Comparison group
Complied	39	38
Defaulted	00	04
Total	**39**	**42**

P = 0.1167

Of the three indicators evaluated, the sputum conversion rate at the end of the intensive phase of treatment of the study group was 95.2% while the rate in the comparison group was 88% (table 03). The treatment success rate for all TB cases of the study group was 95% while it was 86% in the comparison group (table 04). There were no defaulters in the study group whereas 4 (default rate - 9%) defaulters were detected in the comparison group (table 05). All 3 indicators showed that, the outcome of the study group was better than that of the comparison group. However, categorical data analysis revealed that the differences of observed outcomes between the two groups were not statistically significant ($p > 0.05$).

DISCUSSION

Adherence to treatment is a critical factor in determining treatment success.[4] The success of treatment for tuberculosis, assuming an appropriate drug regimen is prescribed, depends largely on patient adherence to the regime. Achieving adherence is not an easy task, either for the patient or the care provider.

The directly observed treatment has generated the most outstanding results in the delivery of TB treatment. When a second individual directly observes a patient swallowing drugs, there is a greater certainty that the patient is actually receiving the prescribed medications. Having a good network of state primary health care centres in Sri Lanka, The National TB Control Programme, has achieved a high success rate in anti TB treatment using health workers as DOT providers. However, defaulting treatment and treatment failures are still substantial in some areas of the island.[1] We believe that the National Programme is over dependent on state health workers in the delivery of DOT neglecting adequate use of other categories.

Substantial amounts of data are available about the delivery of family DOT in the literature. Okanurak et al reported that in Bangkok, family-based DOT following a short period of DOT given in a clinic, resulted in a higher success rate than DOT given solely in a clinic.[5]

A cluster randomized controlled trial in rural Nepal found that family member DOT was as effective as community member DOT.[6] Thiam et al found that in Senegal, family member DOT resulted in an 88% cure rate compared with a 77% cure rate for all other DOT providers.[7] In Yasothorn Province, Thailand, the overall cure rate was 80.4% in a programme in which trained and supervised family members provided DOT in two-third of smear positive patients in 1997.[8] MacInture et al found that in Victoria, Australia, among patients allocated for family DOT, only 58% were able to receive DOT, the major reason being living alone and not having a family member to observe treatment.[9]

Sri Lanka has a high literacy rate and family structures are supportive in many settings. The present study reveals that treatment adherence is high among patients who receive family DOT. The important prerequisites to ensure successful family DOT include correct selection of patients and DOT providers, giving adequate instruction for treatment adherence, and supervision of drug intake by home visits. A similar study using a large sample size covering a wide geographical area would help to generalize the findings of the present study.

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PREVALENCE OF HIV AMONG TUBERCULOSIS OUT PATIENT ATTENDEES

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ABSTRACT

Background : An estimated 2.47 million (2.0-3.1 million) people were living with HIV/AIDS in India by the end of 2006. Among those HIV infected individuals, TB was the commonest opportunistic infection and leading cause of mortality. HIV infection makes a person susceptible to both pulmonary and extra pulmonary forms of TB. Various studies have documented the occurrence of TB from 46 to 65 percent. However, provision of HIV screening services for Tuberculosis out patient attendees is limited at present.

Aims : To study feasibility of counseling for HIV screening and document the prevalence of HIV among TB out patient attendees.

Methods : This prospective explorative study included persons who sought TB screening at TB unit, Madurai from Jan 2003- Feb 2004. An interview schedule was developed to obtain information on socio-demographic profile, risk behavior profile and test results. Information collected includes socio-demographic profile, risk behavior profile and reaction to test results. Univariata and bivariate analyses were performed using Epi-info 6.04 (CDC, Atlanta, GA, July 1996). Chi-square test, student "t" test and one way ANOVA tests were performed to establish statistical significance between dependent and independent variables

Results : This study has found 57.66% chest symptomatic attending TB out patient ward were HIV positive. An analysis of risk profile versus positive results showed that 47(n=75) and 48(n=90) who admitted and denied high-risk behavior respectively, found to be positive to HIV screening test.

Conclusion : The researchers suggest that HIV counseling and testing services can be offered to all chest symptomatic attending TB out patient ward. This structural change will make HIV screening more effective and beneficial to patient community by ensuring early detection HIV infection.

BACKGROUND

One third of the world's population is infected with *M. tuberculosis* and 75% of infected are in developing countries. A WHO review on analysis of the case notifications and overall tuberculosis situation and trend in the world shows that approximately one third of the world's population is infected with *M. tuberculosis*. In the past decades, an average of 2.5 to 3.2 million cases were notified every year globally.[1] The small decrease in notification rates in recent years being offset by population growth. Young people are disproportionately affected by HIV/AIDS due to the risk behavior practiced by this segment of population. Around half of the new infections are in people aged 15-24 years, the range in which most people start their

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sexual activity. Globally 50% of new infections are in women. Low literacy may also limit access to written, risk reduction information. In certain instances drug and/or alcohol abuse may impair judgment and limit the ability to practice safer sex.[2]

According to reports, in India almost 1.5 million people with TB were attending the Primary Health Institutes (PHI) and about one third of the TB burden is borne by the urban conglomeration. As a result about 4 lakh people die of TB every year.[3]

This is feared to increase in geometrical progression in the years to come, owing to growing epidemic of Human Immuno-deficiency Virus (HIV) infection. Even in developed countries where TB once considered to be totally eradicated, recorded a sudden high incidence rate. This renewed global interest in TB in the wake of emergence of HIV has led to a re-examination and refinement of current approaches to its control by international and national organizations.

HIV infection is generally a slowly progressive disease in which the virus is present throughout the body at all stages of the disease and weakens the body immune system and opens up for various infections. India ranks highest among the nations contributing to the global burden of Tuberculosis (TB). Disease burden and depleting immune systems makes an HIV infected individual an easy target for TB infection. Among estimated 2.47 million people living with HIV/AIDS in India, TB is the most common opportunistic infection [4,5] and leading cause of mortality.[6] HIV infection makes an infected person more susceptible to both pulmonary and extra pulmonary forms of TB. Various studies have documented the occurrence of TB among HIV infected patients ranged from 46 to 65 percent. [7,8,9 ,10 ,11,12]

With the introduction of Revised National Tuberculosis Control Programme (RNTCP) in 1997, 70% case detection and cure rate of 8 out of 10 TB patients has been achieved over a period of time.

Though HIV counseling and testing services were started in India in the year 1997, provision of HIV screening for TB out patients is limited. An integrated counseling and testing centre is a place where a person is counseled and tested for HIV, on his own free will or as advised by a medical provider. The main functions of an ICTC include:

1. Early detection of HIV.
2. Provision of basic information on modes of transmission and prevention of HIV/AIDS for promoting behavioral change and reducing vulnerability.
3. Link people with other HIV prevention, care and treatment services

Currently more than 4000 Integrated Counseling and Testing Centres (ICTCs), which are mainly located in government hospitals.[13]

Therefore the researchers have conducted this study to find out the feasibility of counseling TB symptomatics for HIV screening and document the prevalence of HIV among TB out patient attendees.

MATERIALS AND METHODS

This prospective explorative study was carried out at Govt. Rajaji Hospital, Madurai. Pre-test counseling was offered to chest symptomatics and then screened for HIV. Blood for rapid test was drawn only after obtaining written informed consent.

DATA COLLECTION

A semi structured interview schedule was developed and filled by direct questioning by the researchers after obtaining informed consent. Information collected include socio-demographic profile, risk behavior profile, reactions to test results.

This prospective explorative study included persons who sought TB screening at TB unit, Madurai from Jan 2003 - Feb 2004. Chest symptomatics aged 15

years & above, who attended for TB screening at TB out patient ward, Govt Rajaji Hospital Madurai, were met by the professional social worker. Professional social worker offered pre-test counseling and obtained informed written consent. All those who gave their consent were included for the study. Chest symptomatics who were 1) too old 2) too moribund, 3) mentally ill and 4) unwilling to give consent were excluded from the study. A Proforma in the form of an interview schedule with closed-ended questions was developed and filled by direct questioning by the interviewers. The interview schedule was pre-tested prior to administration. Subsequently the interview, which lasted for 15-20 minutes, was held after getting informed consent from the chest symptomatic.

DATA ANALYSIS

Data collected includes socio-demographic profile, risk behavior profile and test results. Thus obtained data were edited and entered in Excel software. Further data cleaning and recoding was done in order to perform meaningful statistical analysis. Using Epi-info 6.04 (CDC, Atlanta, GA, July 1996), Univariate, Bivariate analyses were performed for interpretation. In order to observe statistical significance chi-square test, student "t" test and one way ANOVA were performed. Maximum likelihood ratio, odds ratio at 95% confidence intervals were used for bivariate analysis and interpretation.

RESULTS

Socio demographic characteristics such as age, sex, marital status, occupation, education are given table-1. A total of 167 (107 male, 60 Female) respondents were interviewed, before and after undergoing HIV screening test. One third of male respondents belonged to 31-45 years age group. Half of male respondents and one fourth of female respondents were married. One fourth of male respondents were educated upto high school level and while one tenth of female respondents were illiterate. Sixty two percent of male respondents and 17.4% of female respondents were employed. Mean income of the respondents was INR 1628 with Standard deviation of 102.98. Mean income of women respondents was far less than men's income (Mean INR 868 SD 561). Chi-square test results were statistically significant between the variables such as sex, marital status, education and employment status of the respondents as p -.000.

RISK PROFILE

Risk profile was collected for all the respondents. More than two third of men and one fourth of women respondents had reported pre marital and extra marital relationships (p=0.000). Respondents aged 30 years and above had reported higher incidence of extra and/or premarital contacts. Three fourth of employed respondents have reported extra and/or premarital contacts.

An analysis of risk profile showed that among those who have admitted high risk behavior 46 (n= 75) were sero-positive. Whereas 49 persons (n=92) who denied high risk behavior, found to be reactive to Rapid test.

Categorizations of risk behavior reveal that 15 persons had contact with neighbor and family women. Another 19 had extra marital contacts and contacts with CSW. Both skilled and unskilled labourers were prone to have equal chances of high risk behavior. Persons engaged in farming activities had third highest level of high risk behavior.[14]

An analysis of reactions versus results showed that, about 15 persons initially refused to accept the results and blamed their spouses for their HIV status. Equal number of respondent readily accepted the rapid test results. Another 34 respondents had experienced fear of death and fear of getting identified a feelings associated with shame. Five respondents felt extremely guilty and three respondents had attempted suicide.

Table 1: Socio demographic profile of the respondents

		Male		Female		Total		Chi-Square	df	p-Value
Sex		107	64.1%	60	35.9%	167	100%	13.228	1	.000
		Count	Table %	Count	Table %	Count	Table %			
Age	15-30 yrs.	36	21.6%	36	21.6%	72	43.1%	36.371	2	.000
	31-45 yrs.	56	33.5%	20	12.0%	76	45.5%			
	46-60 yrs.	15	9.0%	4	2.4%	19	11.4%			
	Total	107	64.1%	60	35.9%	167	100.0%			
Marital status	Single	20	12.0%			20	12.0%	308.240	4	.000
	Married	84	50.3%	39	23.4%	123	73.7%			
	Separated	3	1.8%	1	.6%	4	2.4%			
	Divorced			2	1.2%	2	1.2%			
	Widowed			18	10.8%	18	10.8%			
	Total	107	64.1%	60	35.9%	167	100.0%			
Education	Illiterate	27	16.2%	22	13.2%	49	29.3%	71.473	4	.000
	Primary Education	34	20.4%	16	9.6%	50	29.9%			
	Secondary Education	5	3.0%	7	4.2%	12	7.2%			
	High School	40	24.0%	14	8.4%	54	32.3%			
	College Education	1	.6%	1	.6%	2	1.2%			
	Total	107	64.1%	60	35.9%	167	100.0%			
Employment status	Yes	105	62.9%	29	17.4%	134	80.2%	61.084	1	.000
	No	2	1.2%	31	18.6%	33	19.8%			
	Total	107	64.1%	60	35.9%	167	100.0%			
Income		Mean	SD	Mean	SD	Mean	SD			
		1840	SD 1036	868	561	1628	1032.98			

Table 2: Demographic variables versus High Risk Behavior

	HRB	N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Sex	Yes	74	1.11	.313	.036	-6.698	162	.000
	No	90	1.56	.500	.053			
Age	Yes	74	2.77	.673	.078	1.516	162	.131
	No	90	2.61	.665	.070			
Marriage	Yes	74	1.97	.702	.082	-3.187	162	.002
	No	90	2.49	1.238	.131			
Education	Yes	74	2.45	1.315	.153	-.217	162	.828
	No	90	2.49	1.211	.128			
Employment	Yes	74	1.05	.228	.026	-4.341	162	.000
	No	90	1.31	.466	.049			
Income	Yes	69	1678.26	960.678	115.652	.510	129	.611
	No	62	1585.48	1119.111	142.127			

SEROPOSITIVITY

Table-3 presents the sero positivity rate among respondents against socio-demographic variables. Among the subjects screened, 50 males and 45 females had reactive rapid test - a positivity rate of 56.83%. F–test produced results (F value-14.106,p-value.000) shows that positivity rate was statistically significant.

An analysis of risk profile showed that among those who had admitted high risk behavior, 46 (n= 75) were found reactive to Rapid test whereas 49 persons (n= 92) who denied high risk behavior, were found to be reactive to Rapid test.

Occupational distribution of respondents reveals that there was an even distribution of positive test results among both skilled (23) and unskilled laborers (24). Second highest number of positive test results was found among housewife (22).

Respondents within the age group of 31-45 had higher number of positive test results i.e., 27.3% (n= 75). Next higher prevalence rate was found among persons in the age group of 15 to 30 years (26.1%). Persons in 45– 60 years age group had fewer chances of getting infected with HIV.

Married men and women (40%) respondents had reported higher percentage of sero- positive results. Educational attainment had no influence in the seropositivity as it was evenly distributed among respondents with different levels of education as, 20.6% of illiterate, 15.8% of primary education and 15.8% with high school education respondents were found to be positive to rapid test. Employment related travel and economical independence have had some impact on the seropositivity (n=72).

Table 3: Demographic variables versus sero-positive

Demographic Factors		Positive		Negative		Total	
		Count	Table %	Count	Table %	Count	Table %
Sex	Male	50	30.3%	56	33.9%	106	64.2%
	Female	45	27.3%	14	8.5%	59	35.8%
	Total	95	57.6%	70	42.4%	165	100.0%
Age	16-30 years	43	26.1%	28	17.0%	71	43.0%
	31-45years	45	27.3%	30	18.2%	75	45.5%
	46-60years	7	4.2%	12	7.3%	19	11.5%
	Total	95	57.6%	70	42.4%	165	100.0%
Marital Status	Single	7	4.2%	13	7.9%	20	12.1%
	Married	66	40.0%	56	33.9%	122	73.9%
	Separated	3	1.8%	1	.6%	4	2.4%
	Divorced	2	1.2%			2	1.2%
	Widowed	17	10.3%			17	10.3%
	Total	95	57.6%	70	42.4%	165	100.0%
Education	Illiterate	34	20.6%	14	8.5%	48	29.1%
	Primary	26	15.8%	23	13.9%	49	29.7%
	Secondary	8	4.8%	4	2.4%	12	7.3%
	High School	26	15.8%	28	17.0%	54	32.7%
	College	1	.6%	1	.6%	2	1.2%
	Total	95	57.6%	70	42.4%	165	100.0%
Occupational status	Yes	72	43.6%	60	36.4%	132	80.0%
	No	23	13.9%	10	6.1%	33	20.0%
	Total	95	57.6%	70	42.4%	165	100.0%

* 57.66% sero-positivity rate

Table 4: High risk behavior, nature of high-risk behavior versus rapid test result

		Rapid test result			F	p-Value
		Positive	Negative	Total		
High Risk Behaviour	Yes	47	28	75	1.454	0.230
	No	48	42	90		
	Total	95	70	165		

Kind of High Risk Behavior	HIV RESULT		
	Positive	Negative	Total
EMR with neighbor and family women	15	12	27
EMR with CSW	20	14	34
EMR with co workers	6	1	7
EMR with family members	3	1	4
Not Reported	51	42	93
Total	95	70	165

*EMR-Extra marital relationship

Table 5: Associated reasons for HIV screening and rapid results

		Rapid result			F	Sig.
		Positive	Negative	Total		
Reasons	Dr Referral		1	1	8.487	.004
	Due to sickness	49	52	101		
	Sex with Multi-partners	5	4	9		
	Others	27	9	36		
	Total	81	66	147		

Table 6: High-risk behavior against background characteristics

Demographic Factors		Yes		No		Total	
		Count	Table %	Count	Table %	Count	Table %
Sex	Male	66	40.2%	40	24.4%	106	64.6%
	Female	8	4.9%	50	30.5%	58	35.4%
	Total	74	45.1%	90	54.9%	164	100.0%
Age	16-30 years	27	16.5%	44	26.8%	71	43.3%
	31-45years	37	22.6%	37	22.6%	74	45.1%
	46-60years	10	6.1%	9	5.5%	19	11.6%
	Total	74	45.1%	90	54.9%	164	100.0%
Marital Status	Single	12	7.3%	8	4.9%	20	12.2%
	Married	57	34.8%	63	38.4%	120	73.2%
	Separated	2	1.2%	2	1.2%	4	2.4%
	Divorced	1	.6%	1	.6%	2	1.2%
	Widowed	2	1.2%	16	9.8%	18	11.0%
	Total	74	45.1%	90	54.9%	164	100.0%
Education	Illiterate	25	15.2%	23	14.0%	48	29.3%
	Primary	19	11.6%	30	18.3%	49	29.9%
	Secondary	3	1.8%	8	4.9%	11	6.7%
	High School	26	15.9%	28	17.1%	54	32.9%
	College	1	.6%	1	.6%	2	1.2%
	Total	74	45.1%	90	54.9%	164	100.0%
Occupational status	Yes	70	42.7%	62	37.8%	132	80.5%
	No	4	2.4%	28	17.1%	32	19.5%
	Total	74	45.1%	90	54.9%	164	100.0%

DISCUSSION

This study clearly shows that more than half of chest symptomatics attending TB out patient ward were seropositive. Previous studies looked at the occurrence of TB among HIV infected individuals. On contrary, this study has documented the prevalence of HIV among chest symptomatics.

Screening for HIV brings enormous psychological suffering and emotional disturbances. The present study also revealed that denial seems to be very high among those with reactive rapid test results. High-risk behavior was common among both skilled and unskilled labourers. Study results also showed higher incidence of the positive test results among females compared to men. In high income countries, the risk of female-to-male transmission is 0.04% per act and male-to-female transmission is 0.08% per act. For various reasons, lack of privacy,unhgienic sexual practice etc., HIV transmission rates are 4 to 10 times higher in low income countries.[7]

Another important point to be kept in mind is window period. Twenty nine respondents who admitted high risk behavior were negative to rapid test perhaps due to window period. Under these circumstances post test counseling could play an important role in early detection of HIV for further management. Similarly, gap between high risk behavior and negative test results need to be probed further.

Comparative analysis has shown that the rate of positivity is quite high among persons involved in business because of the fact that out of 6 screened 5 were positive. Therefore preventive education should be directed more towards people involved in businesses. Educational status of the respondents found positive to rapid test reveal high prevalence of HIV among those who had illiteracy or primary education. This study has brought out a penetrative need for directing the preventive education to the illiterates.

There is evidence to show that level of general awareness towards HIV/AIDS has increased in the population. However, knowledge and utilization about various services available for prevention, counseling, testing, care and treatment is low. This has resulted in sub-optimal utilization of various services. Counseling and testing services are an important components of prevention and control of HIV/AIDS in the country. Hence, the availability of their services should be popularised among public.

Therefore, to control the TB epidemic and emergence of MDR TB, issue of high prevalence rate of HIV among TB out patient attendees or chest symptomatics need to be dealt seriously. Provision of HIV screening services to all TB out patient attendees could ensure early screening and detection of HIV infection among chest symptomatics.

The present Voluntary Counseling and Testing Centers (VCTC) are recently termed as integrated counseling and testing centers (ICTC). The researchers, suggest that ICTC should be placed alongside TB out patient ward. This structural change will make HIV screening more effective and beneficial to patient community by ensuring early detection HIV infection.

The limitation of this study is that the persons with other High Risk Behavious like homosexuals, bisexuals, Men who have Sex with Men etc. were not studied. Study was carried out in a govt. setting where people belonging to lower socio economic strata tend to attend more. Under this situation it is difficult to judge the prevalence of HIV among persons belonging to higher economic strata and those seeking private health care. These results would vary among well educated persons belonging to high income groups. Due to shortage of time and money a large number of patients could not be covered. Therefore the researchers are of the opinion that, large sample, could have given much better results.

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FACTORS RELATED TO DEFAULTERS AND TREATMENT FAILURE OF TUBERCULOSIS PATIENTS IN THE DOTS PROGRAM IN THE SUNSARI DISTRICT OF EASTERN NEPAL

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ABSTRACT

Objectives : The aim of this study was to investigate reasons underlying failure to complete DOTS treatment in TB patients in Dharan and the Sunsari district of eastern Nepal.

Methods : A descriptive, qualitative study using semi structured questionnaires after identifying cases from register data. Results were then compared with the results of informal recorded discussions, direct observation, and focus group discussions. All defaulter and treatment failure TB patients in the DOTS program in Sunsari district from July 2002 to July 2003 were included in the study.

Results : All of the defaulter patients in this study were struggling financially, and said that they had trouble leaving work to go to the DOTS centre, as well as difficulty with distance and transport. Other issues such as alcohol, stigma, poverty, inadequate education and the use of private clinics and traditional healers were discussed.

Conclusion : Almost half the Nepalese population is infected with TB. Despite meeting the WHO goals for default and treatment failure it is important to aggressively address those aspects that can be changed so the country can continue to reduce the burden of TB on its community. Recommendations are made from the results of this study that may help improve adherence to DOTS programmes.

Keywords : tuberculosis, Nepal, DOTS, defaulter, compliance

INTRODUCTION

Tuberculosis (TB) is major public health problem worldwide. The number of cases of TB is increasing by 2.4% per year with nearly 8.9 million new cases in 2004.[1]

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In Nepal it is estimated that 45% of the total population is infected with TB. 44,000 people develop active TB and 8-11,000 people die each year from this disease.[1] Detection rates are still significantly low – at least in part because of reliance on sputum smears that can only ever detect a proportion of cases.[1] Pulmonary TB accounts for only 36-48% of all people with TB and smear microscopy only detects 45-60% of these.[1]

DOTS (Directly Observed Treatment, Short course) was implemented by the World Health Organisation (WHO) in South Asia in 1993-94 and in Nepal in 1996.[1] Its five elements are political commitment; case

detection by sputum smear microscopy; a system to ensure regular drug supplies; a standard recording and reporting system, including the assessment of treatment outcomes and standard short-course chemotherapy administered under standardised case-management conditions.[1] It is now integrated into the general health services and covers 89% of the Nepalese population. In Eastern Nepal it is run in 46 treatment centres and 253 sub centres.[2]

The goal of DOTS is to reduce transmission in the community by aiming for cure of at least 85%, and detection of at least 70% of new smear positive cases.[2] The purpose of directly observed therapy is to increase the probability of treatment completion. – and to thereby avoid treatment failure, persistent infectivity, drug resistance and relapse.[1] When based in primary health centres DOTS has been shown to have equivalent outcomes and to be more cost effective than treatment regimes based on in-patient supervision or large hospital centres.[1]

About 50% of those infected with TB will die within five years without intervention as compared to only 2-3% of those receiving DOTS treatment. According to year 2000 figures from the Nepalese National Tuberculosis Centre, the treatment success rate for the DOTS program is about 89%, the defaulter rate 6% and the rate of treatment failure 1%. [2]

Multi Drug Resistant (MDR)-TB is defined as resistance to both the first-line TB drugs, Isoniazid and Rifampicin. Since the early 1990's MDR-TB has been on the rise and now threatens TB control programs in many parts of the world. It can be primary, in a patient who has not been treated before, reflecting overall poor TB control in the community, or acquired, reflecting either poor adherence or an inadequately conducted individual program. MDR-TB makes management even more difficult because of the need for longer courses of less potent, more toxic and more expensive second line drugs.[4] Proposed explanations for the rise in MDR-TB include HIV, physician mismanagement, substance abuse and failure to complete therapy due to incomplete or inadequate therapy.[1] The prevention and control of MDR-TB is one of the aims of the 2006 WHO "Stop TB" strategy.[1]

Poverty and tuberculosis are intimately connected.[5] The poor have higher contact rates due to crowded homes, more active infection due to sub-optimal nutrition and working conditions, and they frequently have less access to diagnostic and treatment facilities.[5] They may have less flexibility regarding work and clinic attendance and less ability to pay for medications and transport. A study conducted in an urban area of India in 2000-01 found one quarter of their non-compliant patient were the only economically active person in the family and had no spare time to visit DOTS centres.[6]

The TB control program in Vietnam found that 20% of their defaulters lacked knowledge about the disease and its treatment.[7] A similar study in Nepal found that adherent patients seemed to be better informed about their disease.[8] Illiteracy and difficulty in understanding the information provided by the health worker have been linked with non-compliance.[6]

One way of dealing with this lack of understanding is to increase the level of knowledge in the whole community. A study on the level of knowledge about TB in a rural community in India found that 73.7% knew that cough with sputum was the most common symptom of TB, 95.3 % were aware that TB could spread to others but only 48% knew it was caused by an infectious agent. TB patients share the community's cultural beliefs about causes of TB and its spread. A common misconception was that separate utensils and food were necessary for TB patients.[9] Some may choose to seek help from traditional healers. The stigma of the disease is likely to be influenced by many of these beliefs and decisions.[10]

Alcoholic patients are more likely to be irregular in their compliance with treatment. A study in India found 28% of defaulters were alcoholic. Distance from the health centre and inconvenient office hours have also been found to be important in treatment compliance

with DOTS therapy.[11] Patients often discontinue TB medication because of such side effects as weakness, GI upset, allergy, jaundice and passing of red urine.[7]

Ineffective or inappropriate prescriptions of TB drugs are very common outside the DOTS program. In India it was found that private prescriptions commonly contained errors and that multiple brands and combinations of drugs led to confusion for patients. In one study 81% of pharmacies had been dispensing private anti-tuberculosis prescriptions and 95% were not aware of the existence of the DOTS program. In the same study 55-62% of individuals with chest symptoms initially approached private medical practitioners.[12] The aim of this study was to investigate reasons underlying failure to complete DOTS treatment in TB patients in Dharan and the Sunsari district of eastern Nepal.

MATERIALS AND METHODS

The study was undertaken in the teaching district of B.P.Koirala Institute of Health Sciences (BPKIHS), Dharan.

Study design: A Descriptive, Qualitative study using semi structured questionnaires after identifying cases from register data. Results were then compared with the results of informal recorded discussions, direct observation, and focus group discussions.

All defaulter and treatment failure TB patients in the DOTS program in Sunsari district from July 2002 to July 2003 were included in the study. Of the 1040 registered TB cases in Sunsari district there were 35 cases eligible for inclusion as well as 23 relatives and DOTS health staff. TB cases continuing with or completing the DOTS program during the study period were excluded from the sample.

Treatment failure was defined as a patient who is still sputum smear positive five months or more after the commencement of treatment. A defaulter was defined as a patient whose treatment was interrupted for two consecutive months or more.[2]

Information was obtained from unstructured interviews with respondents at home (patients' relatives, patients themselves); in-depth interviews using a questionnaire with defaulters, treatment failure patients, key informants, and DOTS workers; focus group discussions with patients and relatives; and observation in DOTS Centres and homes by the researcher.

DOTS centres case finding and treatment records were analyzed in collaboration with the health workers. The distance from DOTS centres and the DOTS worker's opinion about the reason for those who defaulted or failed treatment were recorded. All individual defaulter and treatment failure cases were visited and interviewed.

The questionnaire in English was designed after consultation with DOTS workers, then translated into Nepali by the researcher and pre-tested on patients at a DOTS clinic. The questions were re-translated back to English, by a translator to maintain consistency in the meaning.

Focus group discussions were held with four groups: defaulters, relatives of defaulters, those living in urban areas close to a DOTS centre and those living in more distant rural areas.

RESULTS

Of the 1040 registered cases of TB in the Sunsari district (population 588,212), there were 27 defaulters, eight treatment failures and two patients who died during the study. Of the 344 TB cases in Dharan (population 103,012), there were 12 defaulters and four treatment failures. Four PHC, three HC, thirty three DOTS centres and sub-centres were visited.

Results of focus group discussions : Participants from all groups were aware that TB is a communicable

and curable disease, they wear also aware of the most common symptoms, means of diagnosis and that it has increased prevalence among the poor. The results of the focus group discussions are summarised in box below.

Interviews with the DOTS workers : Most thought that there was adequate counselling for TB patients but thought that defaulters were still confused about their disease and treatment. They discussed that the reason why some patients consulted traditional healers was because the patients did not understand the inefficiency of traditional healers and another reason for consultation was because the patients valued the relationship with the traditional healer.

The respondents were of the opinion that there were no problems with the DOTS office timing as arrangements were made to keep it open after office hours. They thought that some of the main reasons for defaulting were social, stigma against the disease transportation and financial difficulties.

Interviews with patients : Most thought their knowledge about the disease and it treatment was inadequate and almost half said they had no counselling at all before being given treatment.

Participant's opinions as to why patients defaulted from treatment

- Alcoholics and smokers were not committed in taking caring of their own health, usually had a poor diet, often complained of weakness after treatment and may have had improper counselling and distribution of medicine.
- Patients may have felt better and so ceased medication
- Patients had difficulty walking long distances
- Patients having their own job had difficulty in going to the DOTS centers because of the fixed timing of the centers.
- There were improper storage systems and ineffective drugs at DOTS centres
- Private clinics were accessed for confidentiality reasons despite the lack of follow up
- A lack of knowledge in the community about TB, diet, medication and follow-up
- The use of traditional healers
- Younger patients and females in particular because of their fear of not being able to get married, may default because of the stigma associated with the disease
- Those from lower socio-economic groups who migrated to other areas or even other countries looking for work were less likely to complete treatment
- The elderly found it difficult to travel to the DOTS centre each day
- Lack of incentives for DOTS workers to do home visits and follow-up

Over half the patients were the family's main income earner and most defaulters cited insufficient income as a reason for not completing treatment. As compared to the opinion of the DOTS workers, only 12 patients thought they needed to hide their disease and most did not think that confidentiality was a reason for attending private clinics.

Distance from the DOTS clinic was more important factor than the DOTS office hours, despite the fact that all 35 of the defaulters worked from 10am – 5pm which were the only hours their local DOTS clinic remained open.

DISCUSSION

In the present study the defaulter rate in Sunsari district in 2002-03 was 2.5% and the failure rate 0.7%. The National Tuberculosis Control Programme, (NTP) Nepal aims for a defaulter rate of <10% and a failure rate of <4%.[5] Other sources recommend much tighter control with rates of <5% and <1% respectively.[5] The record of the NTP (1999-2000) for Sunsari District had default rate of 9% and failure rate of 2%.[2]

Despite excellent figures for Dharan and Sunsari district, TB is still a major Public Health issue for Nepal and much still remains to be done to have better control. As Médecins Sans Frontiers points out, not only is there much to be done with current tools, but new and better diagnostic tools and medications are urgently required worldwide.[3] With the emergence of MDR-TB there is need to give increased importance for the completion of treatment.

All of the defaulter patients in this study were financially poor had trouble leaving work to go to the DOTS centre, as well as difficulty with distance and transport. Many were the families' chief income earner, all were in debt and a majority of the rural interviewees in this study thought distance from the clinic was a major problem. The problems associated with directly observed therapy in rural districts of Nepal were addressed recently by an article in the Lancet. The study found that family-member and community DOTS strategies had similar success rates to the usual directly observed therapy by DOTS workers.[13]

Many DOTS worker felt that lack of knowledge was one of the reasons for defaulting and many patients also felt that their knowledge on TB was below average. On the other hand most DOTS workers thought their counselling was adequate and the focus groups discussion revealed that the knowledge of the participants was reasonably accurate. The previous study in eastern Nepal had discussed about lack of knowledge on side effects of anti-TB drugs and also about the consequences of stopping TB treatment.[8] General knowledge about TB was reasonable in both adherent and non-adherent groups but there is room for more education of both patients and the general community.[13] In the DOTS centre from which there were no defaulters, all the workers were local people. Having local staff at the DOTS centres may improve the capacity of the center in giving health education and thus reduce the defaulters.

In one south Indian study 25% of patients almost two third of the defaulters were alcoholic.[11] In our study the focus groups heavily emphasized alcohol as a major issue for defaulting treatment. Nearly half of the defaulters and treatment failures were spending money on alcohol.

A number of patients reported intermittent use of private clinics for privacy and also to avoid social stigma while visiting DOTS centre. Private clinics generally lack record keeping and follow up arrangements, and do not link records with those of the DOTS centre. Integrating TB care between all providers is another of the priority areas for the WHO 2006 "Stop TB" strategy.[1]

Home visiting may be a powerful tool to reduce the defaulter rate. After the researcher visited the homes of the 12 defaulters under one particular DOTS centre, 6 of them returned to treatment. A study in the Morang district of Nepal also reported that home visiting was very effective in retrieving patients.[8]

CONCLUSION

Based on the findings of this study, it is recommended that accessibility to quality services and improvement in patient education needs to be done. More DOTS centres with more flexible working hours are needed so that they are easily accessible to all patients. Adequate education to community and family-members on DOTS strategies is recommended. DOTS program should be introduced in all private clinics as a priority as suggested by the WHO. Home visits by the DOTS workers should be encouraged especially targeting working, elderly and severely ill patients.

TB will remain a major cause of morbidity and mortality in Nepal because of social issues like poverty, alcohol consumption, illiteracy, distance from health centres and stigma about the disease. These issues needs to be addressed appropriately and aggressively so that the country could contribute significantly in achieving the WHO goal of reducing the Global burden of TB.[14]

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AN EPIDEMIOLOGICAL STUDY ON PATTERN OF SMOKING, ALCOHOL AND OTHER DRUGS CONSUMPTION AMONG FEMALE TEA PLCUKERS IN NUWARA-ELIYA, DISTRICT, SRI LANKA

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ABSTRACT

Introduction : Smoking and alcohol consumption among the estate population are considered to be high. However there is little documented evidence on the prevalence of smoking and alcohol consumption among female estate workers in Sri Lanka. The aim of this study was to find out the prevalence of smoking, alcohol and other dugs consumption among female estate workers and to find out factors associated with these habits.

Methodology : A community based cross sectional study was carried out with a sample of 928 females on a presumptive prevalence of 10% of alcohol users, using simple random sampling technique. Data was collected by trained field public health midwives using an interviewer administered questionnaire. Statistical analysis of data was carried out using SPSS version 11.

Results : The response rate was 97.8%. Prevalence of smoking, alcohol and other drugs were 7.27%, 34.7% and 0% respectively. Among smokers, most smoked cigar (55%), followed by Beedi (39%) and cigarette (6%). None indulged in dangerous drugs like Heroin and cannabis. Most consumed alcoholic beverage was toddy (64%) followed by arrack (31%). Seventy four percent of women stated that they consume alcohol because they were influenced by their husbands. A significant positive association was observed between smoking and (a)illiteracy ($p<0.05$) (b) marriage($p<0.05$) (c) age more than 35 years ($p < 0.01$) .There was a significant positive association observed between alcohol consumption and (a)illiteracy ($p<0.001$) (b) marriage($p<0.001$) (c) parental drinking ($p<0.001$).There was a significant positive association between the use of alcohol and dispute within the family ($p<0.001$) as well as dispute with the neighbours ($p<0.01$)

Conclusion : One third of estate women consume alcohol and 7% indulge in smoking, which is very much more than for the rest of the country. There is an urgent need for health awareness to be implemented in the estate sector to overcome this problem.

Keywords : Alcohol, smoking, estate women, Sri Lanka, prevalence

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INTRODUCTION

Although women drink less than men, the number of women who drink is significant. Global estimates indicate that of the 15.1 million people who abuse

alcohol or are alcohol dependent, 4.6 million are women. That means that roughly one third of alcoholics are women.[1] There is indirect evidence indicating that alcohol consumption is increase in Sri Lanka. This is based on the increase number of Cirrhosis of the liver seen in hospital practice. According to hospital data chronic liver failure and cirrhosis mortality rates in year 2000 were 5.7 per 100,000 for males and 0.9 per 100,000 for women.[2]

The consumption of cigarettes and other tobacco products and exposure to tobacco smoke are the world's leading preventable cause of death, responsible for about 5 million deaths a year, mostly in poor countries and poor populations. Latest estimates reveal that, of the nearly 4 million men and 1 million women who died, over 2 million men and 380,000 women were in developing countries [(3)]. About 250 million women in the world are daily smokers. About 9% of women in developed countries and 9% of women in developing countries smoke tobacco. In addition, many women in South Asia chew tobacco.

The tobacco industry promotes cigarettes to women using seductive but false images of vitality slimness, modernity, emancipation, sophistication, and sexual allure. In reality, it causes diseases and death. Tobacco companies have now produced a range of brands aimed at women. Most notable are the "women only brands". These feminized cigarettes are long, extra slim, with low tar and light colored.

Studies have shown that the prevalence of tobacco smoking in adult males, above 18 years of age, is high (48% -63%) in Sri Lanka. Due to cultural inhibitions smoking is still uncommon in Sri Lankan females; the prevalence reported being less than 2%.[4]

There are many on going programmes aimed at reducing alcohol, smoking and other drugs consumption in Sri Lanka. These programmes use various approaches. Some programmes are aimed at school children trying to prevent them from starting to drink. Some programmes are aimed at women teaching them how to cope with their husbands drinking. There are several programmes aimed at rehabilitating alcoholics and drug addicts. In spite of these programmes, consumption of alcohol, smoking and other drugs are on the rise.

The plantation population of Sri Lanka, numbering nearly one million in 2001, is concentrated in a geographically contiguous area in the highlands of Sri Lanka. They provide the main labour component of the tea industry. Tea is the principal agricultural commodity of Sri Lanka. Tea pluckers are almost exclusively women. The tea crop accounts for 223,000 hectares (10% of the total cultivated area of Sri Lanka) and employs 400,000 people or 16% of the total labour force. Tea plantations are concentrated in the Nuwara eliya district, which forms our main field study area.

Nuwar eliya district where most plantation workers live has consistently recorded an above average maternal mortality and infant mortality rates. The lower health status of the plantation population is also illustrated by their lower life expectancy at age one. Female life expectancy is lower than male life expectancy in Nuwara eliya district. The Indian Tamil population has the lowest literacy levels in the country. Only 66.9% of this population is literate, compared to 88.4% for the Sinhalese and 86.9% for Sri Lanka Tamil. Among all females in Sri Lanka, this group of plantation workers has the lowest literacy rate of 55.1%. The widest gender gap in literacy among all ethnic groups in Sri Lanka is also seen within the plantation group.

Alcohol is the most prevalent addictive substance used in Sri Lanka and this practice has been in existence for centuries. Although, accurate estimates are not available for Sri Lanka plantation sector, it is very likely that the health, economic and social cost of alcohol is enormous. Drugs and alcohol may cause problems related to health (physical and mental) behaviors', family, work, money and law. Situation is worse when both partners of the family are indulging in alcohol consumption together. Tensions and arguments

within the family are frequent. Usually in Sri Lankan scenario, children nourishment and education depend on mother's ability. So mother's behavior definitely adversely affects children nutrition and education.

Drugs and alcohol misuse can also cause problems for society at large. Widespread drugs or alcohol misuse leads to broken families and the neglect of children, who are the foundation of a country's strength and future.

Studies on alcohol, and other drugs use among females in Sri Lanka, especially plantation sector, are scarce. Hence this study was useful to achieve the following objectives.

To estimate the prevalence of alcohol and other drug consumption among female tea pluckers in the plantation sector Kothmale MOH area Sri Lanka.

To determine the impact of alcohol and other drugs consumption on the well being of families of these women.

METHODOLOGY

Study design: Community based cross sectional study was carried out among adult female tea pluckers residing in Kothmale MOH area, Central Province, Sri Lanka.

Study setting : Kothmale MOH area, Nuwara eliya district, Sri Lanka was selected for the study. It has a population of nearly 100,000. 41% of its population is estate population.

Study Population : The study population consisted of female tea pluckers who fulfilled the following criteria.

Inclusion criteria : Adult women who are currently engaged in tea plucking and who are permanently residing in the study area.

Exclusion criteria : Women with a diagnosis (as confirmed by a diagnosis card or a clinic record) of any chronic illness, physical abnormality or mentally subnormal were excluded from the study. Women who refused to participate in the study. Women below the age of 18 years were also excluded from the study due to ethical reasons.

Sample size was calculated using the following formula[5] $N = Z^2\ p(1 - p)/d^2$

N = Sample size
Z = value of 1.96 that corresponds to a confidence interval of 95%
d = Level of precision – 0.02
p = Expected prevalence – 10%
Non response rate – 10%

Sampling procedure : The women of the study population were working in 13 estates. Using pay sheet as a sampling frame, 950 women were selected using random sampling.

Method of Data Collection : An interviewer administered pre coded structured questionnaire was used as a study instrument. Questionnaire was pre tested among the adult female tea pluckers in another MOH area. Data collection was carried out in a confidential place in the work place. Field Public Health Midwives (PHMM) was selected as field investigators to assist Principal Investigator in data collection. Field investigators were given a two days training on importance of assessing eligibility criteria and minimizing non response was emphasized. Ensuring uniformity during data collection by investigators was stressed. Ethical clearance for the study was obtained from Ethical Review Committee of Faculty of Medicine, University of Peradeniya, Sri Lanka. Analysis was done using the SPSS software package.

Measures taken to ensure quality of data : The following measures were taken to improve the quality of the data both at the designing stage and the implementation stage of the study.

A. Steps to minimize random errors

An adequate sample of women was selected for the study. The sample size was calculated using a standard formula which estimates a population proportion with specified relative precision.

B. Steps to minimize systematic errors

1. Selection bias

The most recently updated sampling frames were used in drawing the study sample. The simple random sampling method was used to draw a representative sample from the study population and inclusion and exclusion criteria were clearly defined and strictly followed in order to minimize selection bias.

- **Non response**

  Absenteeism of women was minimized by informing them through plantation management.

2. Information bias

Information bias occurs systematically owing to the following three sources, namely, variation in subject, instruments and observers.

- **Variation in subjects**

  Data were collected within the familiar environments in the morning periods of normal working hours.

- **Variation in instruments**

  Questionnaires were designed with much emphasis on its format to include operational and clear variables. Following measures also were taken to improve validity of questionnaire:

  - Review of previous questionnaires used in local and foreign studies.
  - Pre-test.

- **Variation in observers**

  Observers were uniformly trained by the PI and a resource person on administering the questionnaire. They were adequately supervised during data collection.

RESULTS

The study included 928 tea pluckers with a non-response rate of 2.3%. Non respondents were not different to those who completed the study. Seventy eight percent of women were literate, while 4.5% had received any school education. Among the study population a majority of women were married (82%) while 12% of women were never married. It was observed that 64% of women were receiving a monthly income of 5000-10,000 S.L.Rs.

In the present study, study subjects' frequency of alcohol, smoking and other harmful drugs consumption was determined based on their response to the following.

(a) Ever consumption of above substance
(b) Consumption of substances during the past year
(c) Consumption of substance during the past 2 weeks.

Based on their responses they were assigned to one of the following three categories.

(1) Never/Abstainers- Never consumed
(2) Occasional users– Who had not consumed any form of substance during the two weeks preceding the interview, but had consumed during the preceding year.
(3) Current users- Who had consumed during the fortnight preceding the interview.

According to this classification, prevalence of smoking and alcohol is given in the Table 1.

Table 1: Prevalence of alcohol consumption and smoking among female tea pluckers in Kothmale MOH area

Frequency	Alcohol consumption (%)	Smoking (%)	Tobacco use (betel)
Never	606 (65.3%)	861 (92.8%)	125 (13.4%)
Occasional	100(10.8%)		153 (16.5%)
Regular (current)	222 (23.9%)	67 (7.2%)	650 (70.0%)
Total	928 (100.0%)	928 (100.0%)	928 (100.0%)

None of the women in the study population were indulged in other harmful substance. Eighty percent of women had started drinking before the age of 24 years. Similarly forty five percent of women had started smoking before the age of 24 years. Majority of women in ever consumption of alcohol group were in the 38-58 years age group.

Type of alcohol and smoking (tobacco use)

For individual who had consumed alcohol during the fortnight preceding the interview, the alcoholic beverage that had contributed the most amount of ethanol was considered as their favored alcoholic drink. Accordingly, most consumed alcohol beverage was toddy(64%) followed by arrack(31%) and beer (5%). None had consumed wine and 'Kassippu' (locally made alcohol beverage). Among smokers, most smoked cigar (55%), followed by Beedi (39%) and cigarette (6%).

Association between alcohol consumption and selected socio-demographic variables:

Table 2 describes the significant factors that are associated with alcohol consumption in Univariate analysis.

Table 2: Factors with significant association with alcohol consumption

Factors	Level of Significant
Illiteracy	χ^2 = 153 df=1, p< 0.0001
Married civil status	χ^2 = 44.6 df=1, p< 0.001
Parental drinking	χ^2 = 26.3 df=1, p< 0.01

Table 3: Distribution of regular drinkers by drinking companion

Drinking companion	Number	%
Husband	193	86.9
Alone	09	4.1
Work mate	11	5.0
Family members other than husband	09	4.1
Total	222	100.0

According to Table 3, most common drinking companion was her husband

Table 4: Most common reasons given by women for consumption of alcohol

Reasons for drinking	No
Because my husband also dinks	167
Because my parents also drink	76
To keep company with friends	06
To relive body aches after work	156
To forget my worries	178

More than one answer was stated by the respondents.

Reasons for not drinking were also assessed. The common reasons stated by the women in the study were listed in table 5.

Table 5: Reasons for not drinking	
Reasons for not drinking	No
It costs too much money	524
Not good for the health	129
Upsets family	328
Can interfere with work	222
My husband does not like	87
It goes against my religion	12

Fifty seven percent of ever drinkers stated that they had an alcohol outlet more than 5 Km from their line room. Over all 80% of the ever drinkers felt that price of alcohol was either very expensive or expensive.

Alcohol related social problem :

Table 6: Significant social problems associated with alcohol consumption	
Factors	Level of Significance
Intra family dispute	$\chi^2 = 6.6$ df=1, $p < 0.05$
Dispute with neighbors'	$\chi^2 = 10.7$ df=1, $p < 0.05$
Selling and mortgaging of household items during past one year	$\chi^2 = 55.0$ df=1, $p < 0.01$

DISCUSSION

This study provides meaningful information for the formulation of necessary policies and strategies for improving quality of life of the estate female workers. In addition, the findings of this study will also establish a baseline for future studies.

The low no response rate could be attributed to the management structure of the estate and also selecting females as field investigators (PHMM).

The main instrument in the study was an interviewer administered questionnaire. The validity of the data obtained through this instrument depends on the ability of the interviewer to elicit accurate information with minimal bias. The use of self administered questionnaire demand some level of education and skill from the respondent. In the present study only 78.2% of women were literate; therefore interviewer administered questionnaire is the most suitable.

Prevalence of alcohol consumption : It was found that in the present study 24% of adult female tea pluckers were current alcohol users. Previous studies done in Sri Lanka revealed very much lower prevalence.

Study done by Nugegoda et al (1996) found that less than 0.3% of female were consuming alcohol in rural area of Central Province in 1996.[6] Study done in Gampaha district, Sri Lanka, about 10 years ago gives 8% prevalence among women.[7]

Compared to the previous studies done in Sri Lanka, in plantation sector, alcohol consumption among women were very high. Because of Sri Lankan cultural back ground in the rural set up many women remain abstain, but results of the present study may be a warning to policy makers and health care providers in the estate sector.

The highest prevalence of alcohol consumption was seen in the 38 -58 years age group which agree with the data of other similar studies.[8, 9]

This is matter of concern as this includes most of the economically productive group of a work force. The higher percentage, seen in working age groups especially among women emphasize the importance of starting more preventive activities directed at work places. Human Development Trust which promotes health and other welfare activities in the plantation sector should provide more substance abuse prevention programme targeting especially on these women.

Prevalence of smoking and tobacco use : Due to cultural inhibitions, smoking is still uncommon among Sri Lankan females, the prevalence reported being less than 2% among adult females.[4] But in the present study prevalence of smoking among adult tea pluckers is 7.2% which is much higher than the previous studies.

But compared to the prevalence rate of other neighboring countries this figure is low. The results of WHO survey indicate that the overall prevalence of daily smoking among women in Nepal was 62.4%[10] In an urban survey conducted during 1992-1994 in Mumbai, India 57.5% of women in the age group of 35 years and above were current tobacco users, almost all of smokeless tobacco (only 0.4% smoked). Another study revealed beedi and cigarette smoking is high (at least 30%) among women in Bihar and the northeastern states. Policy decisions taken in Sri Lanka in recent years to stop tobacco promotion and prohibition of smoking at public places may have influenced the declining trend of tobacco smoking in the recent past.

Although the majority of women in study population did not smoke, 70% of estate workers were regular betel- quid chewers including tobacco in betel –quid chewing.

Association between alcohol consumption and other variables : A significant finding in the present study was that there was an association between literacy and alcohol consumption among female tea pluckers. Females with less education were more likely to have consumed alcohol compared to females with better education. The percentage of currently married females in the present study was 82%. There was a statistically significant positive association between ever consumption of alcohol and marriage. Married women tend to drink more than the currently not married women. The influence of husband may be the cause for this association. The study revealed that family dispute within the family and with neighbor was high in estate sector (37% and 21.3% respectively). Study done by Nugegoda et al at rural community in Kandy district, Sri Lanka found that much lower prevalence (6.3% and 8.7%) respectively[(6)]. The present study observed that there was a very high statistically significant association between alcohol consumption of females and family disputes. This study also revealed that parental drinking is significantly associated with women consumption of alcohol. These findings are consistent with those seen in studies conducted in Sri Lanka.[6] This can be the results of either a genetic factor or an environmental influence. This study has some drawbacks. None of the study participants stated that they had consumed illegal substances like heroin, cannabis, and alcoholic beverages. The nature of the study instrument (interviewer administered questionnaire) might have influenced the answering of these issues. Because of the traditions of the Sri Lankan culture, the subjects may not have given the correct information about the use of illicit substance. A self administered questionnaire would have been better option.

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TUBERCULOSIS PATIENTS OPINION FOR DIRECTLY OBSERVED TREATMENT SHORT-COURSE (DOTS) PROGRAMME OF NEPAL

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ABSTRACT

Background : DOTS is the most effective strategy available today for tuberculosis control.

Objectives : To find out patients knowledge and opinion about DOTS programme of Nepal.

Methods : The prospective study was conducted in tuberculosis patients attending DOTS programme in Nepal. Questionnaires are used to collect patient knowledge and opinion.

Results : Tuberculosis was most (73%) commonly found in economically active age group (21-50 years old). The incidence of tuberculosis was found higher in male than in female, most of them were married (55%). Tuberculosis cases were commonly found in rural areas 59%, most of them were illiterate 27% and farmers 23.6% respectively. Majority of patients (72%) family size was large 5-7 persons. Knowledge about DOTS programme, majority of the patients (58.3%) answered correctly. The patient's opinion for improving DOTS programme of Nepal, most of them (26.6%) suggested to educate the TB patients and their family members about tuberculosis (method of transmission, dose and side effects of medicine, suitable method for disposable of sputum and other materials and what are the consequences, if drug doses are not completed), 20% of the respondents were of the view that the medicine for tuberculosis should be made available in each and every health care units, 17.6% suggested that according to patients problem drug should be allowed to bring home for one month, 10% suggested to improve behavior of health care workers, 7.3% suggested government should provide free balance diet along with free medicine, 5% suggested make more publicity and 13.3% of patients had no suggestion they thought it was satisfactory.

Conclusion : To improve the efficacy of DOTS programme, along with free medicine and directly observed treatment, Tuberculosis control authority should design health education programme for patients, family members and community people such as mode of transmission, preventive methods of tuberculosis and consequences of incomplete treatment.

Key words : DOTS, TB, Knowledge

INTRODUCTION

Directly Observed Treatment Short-course (DOTS) is a TB control strategy pioneered by the International Union Against TB and Lung Disease (IULTD) and recommended by World Health Organization (WHO). The WHO advises that all TB patients should have at least the first two months of their therapy observed (and preferably the whole of it observed): this means an independent observer watching tuberculosis patients swallow their anti-TB therapy. The independent observer is often not a healthcare worker and may be a shopkeeper or a tribal elder or similar senior person within that society. DOTS is used with intermittent dosing (thrice weekly or 2HREZ/4HR_3). Twice weekly dosing is effective (A 62-dose, 6 month therapy for

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pulmonary and extra-pulmonary tuberculosis), but not recommended, because there is no margin for error (accidentally omitting one dose per week results in once weekly dosing, which is ineffective). There are five key elements that are considered essential for the implementation of the DOTS strategy. These are: 1. Government commitment to sustained TB control. 2. Sputum smear microscopy to detect the infectious cases among those people attending health care facilities with symptoms of pulmonary TB, most importantly cough of three weeks' duration or more. 3. Standardized short course anti-TB treatment for at least all sputum smear positive pulmonary TB cases, with direct observation of treatment for at least the initial two months. 4. Regular, uninterrupted supply of anti-TB drugs and diagnostics, and 5. Monitoring and accountability system for programme supervision and evaluation of treatment outcome for each patient diagnosed[1].

The review of National Tuberculosis Programme (NTP) of Nepal was carried out jointly by Nepal Government and World Health Organization in 1994. The review team was found the case finding result of 30% and the cure rate of only 40%. The review team recommended Nepal Government to change the NTP strategy to achieve better result. DOTS strategy was adopted in Nepal by approval of 5-years development plan in 1995. Impressive achievements have been made since then. The NTP has rapidly expanded the DOTS coverage from 1.7% in 1996 to 100% by July 2003. In fact, by July 2001, the DOTS strategy has been expanded to all the districts of Nepal. By mid July 2006 the number of DOTS centers reached 560 treatment centers with 2,795 sub centers, established and integrated with general health services throughout the country. Now almost all diagnosed TB patients are getting treatment under DOTS strategy with more than 85% treatment success rate (now 88%)[2].

METHODS

The present prospective study was carried out in tuberculosis patients who attended Directly Observed Treatment Short Course Programme in, Kathmandu Medical College Sinamangal Kathmandu and German Nepal Tuberculosis Project Kalimati, Nepal during 2006 to 2007. The study was conducted based on questionnaires included 300 diagnosed cases of pulmonary tuberculosis. A structured questionnaire prepared in English and translated into Nepali language was the tool for data collection. The research objectives and methods explained to the patients, and verbal consent obtained from them before the data were collected. The selection criteria of patients were based on random sampling. Open ended self administered questionnaires was given to the tuberculosis patients and requested to fill the questionnaires to collect their knowledge and opinion and those who are illiterate were taken interview. The questionnaire consisted of two sections. Section one, dealing with patient background characteristics (age, sex, marital status, family size, education, occupation and urban rural distribution). Section two, dealing with patients knowledge and opinion about DOTS programme of Nepal. Data was analyzed by EPI-Info version 3.3.2, document version 8.08 updated Sept 2005 and presented by means of tables and diagrams.

RESULTS

A total 300 tuberculosis patients were included in this study. Tuberculosis was most (73%) commonly found in economically active age group (21-50 years old) shown in figure 1. Tuberculosis was found higher in males than females, most of them were married (55%), living in rural areas (59%) and 72% tuberculosis patients family have 5-7 family members were shown in table 1. Majority of patients are illiterate (27%) and farmers (23.6%) were shown in figure 2 and 3 respectively.

It is obvious from the data compiled from the questionnaires that majority (58.3%) of the respondents were aware about DOTS programme and answered correctly were shown in table 2. The patients were asked to give their opinion for

improving DOTS programme of Nepal. Majority of the respondents suggested to educate TB patients and their family members about tuberculosis (methods of transmission, dose and side effects of medicine, suitable method for disposable of sputum and other materials and what are the consequences if drug doses are not completed) shown in table 3.

Table1. Socio-demographic characters of TB patients

Gender wise distribution of patients	Males	Females
	64%	36%
Marital status of patients	Married	Unmarried
	55%	45%
Urban and rural distribution of patients	Urban	Rural
	41%	59%
Family size of patients	Family members (2-4)	Family members (5-7)
	28%	72%

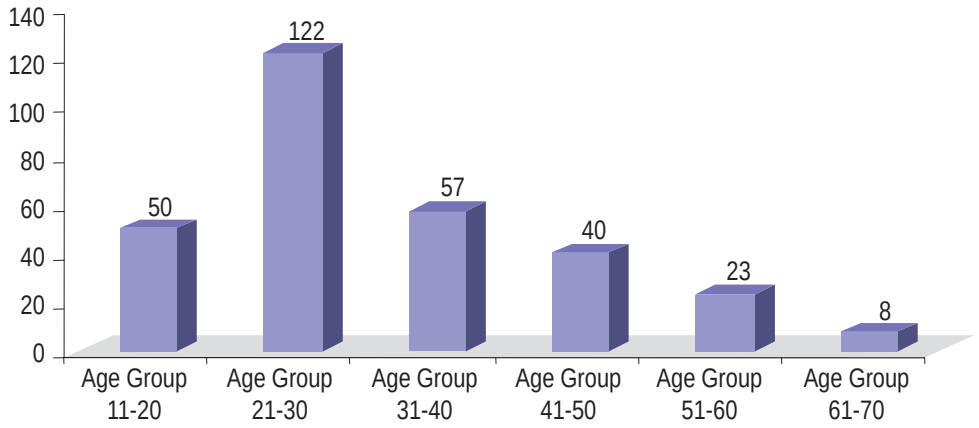

Figure 1: Age wise distribution of patients

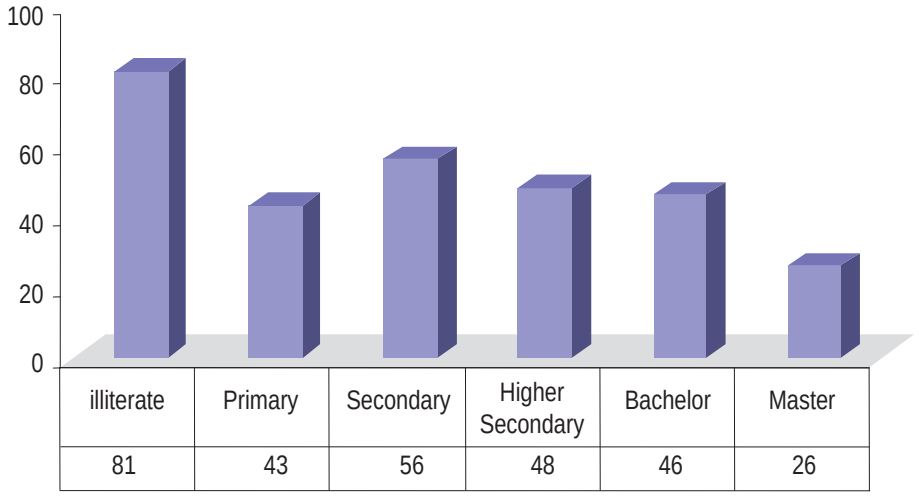

Figure 2: Educational qualification of patients

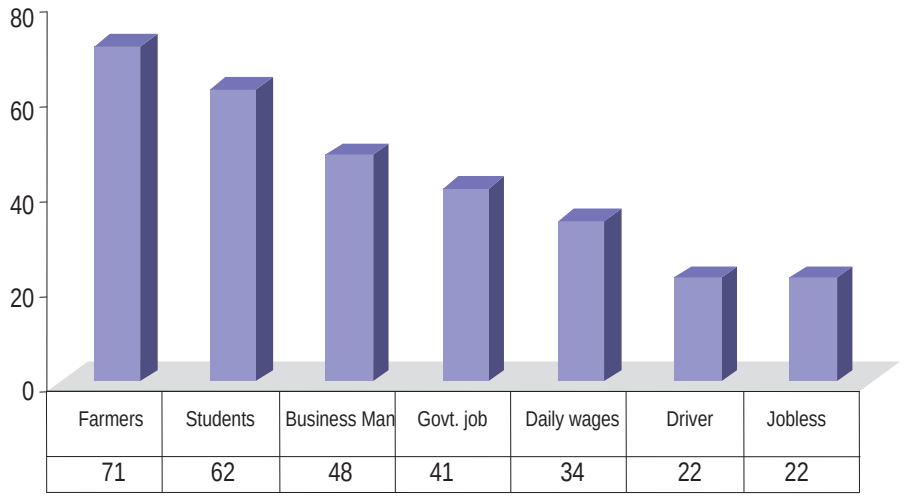

Figure 3: Occupation wise distribution of patients

Table 2: TB patient's knowledge about DOTS programme

Knowledge about DOTS programme	Patients answer	Frequency	Percentage
Known	Patients should swallow TB drugs under direct observation of health worker or social worker	175	58.3%
Partially known	Method of tuberculosis treatment.	30	10%
	Patients get free TB medicine.	20	6.6%
Don't know	Don't know	75	25%

Table 3: Patients opinion for improving DOTS programme of Nepal

Patients opinions	Frequency	Percentage
Educate TB patients and their family members about tuberculosis (methods of transmission, dose and side effects of medicine, suitable method for disposal of sputum and other materials and what are the consequences, if drug doses are not completed).	80	26.6%
TB medicine should be available at each health care unit.	60	20.%
According to patients problem (those who are coming from far distance) drug should be allowed to bring home for one month.	53	17.6%
Improve behavior of health care workers.	30	10%
Government should provide free balance diet along with free medicine.	22	7.3%
Make more publicity.	15	5%
No suggestion, they thought it was satisfactory.	40	13.3%

DISCUSSION

Tuberculosis is a social disease with medical aspects. It has also been described as a barometer of social welfare. The social factors include many non-medical factors such as poor quality of life, poor housing, and overcrowding, population explosion, under-nutrition, lack of education, large families, early marriages, lack of awareness of causes of illness, etc. All these factors are interrelated and contributed to the occurrence and spread of tuberculosis [3]. Drug resistance is caused by inadequate treatment and poor tuberculosis control programmes. The most common reasons for the development of resistance are a) Incorrect prescription, b) Irregular supply of drugs, c) Non compliance of treatment, and d) Lack of supervision and follow up. Directly observed treatment is necessary to ensure that people take TB medicines correctly. Unsupervised treatment commonly results in mistakes in taking medicines. Various studies have demonstrated that about 30% of people do not take medicines as prescribed. Common mistakes include missing doses of medicines, selective avoidance of some medicines and dividing doses inappropriately. The basic principle of DOTS is therefore to assist patients to help them adhere to their treatment. Without DOTS, the cure rate in TB patients is usually less than 60% and often much lower. With DOTS, it is possible to achieve cure rates in excess of 90% [4].

Nearly two thirds (64%) of the patients are males as a case of high incidence which is in agreement with (65%) the study conducted by Bam (2003)[5]. In almost all areas where the TB is the public health problem, the incidence of TB among woman is less than man. Gender is not merely the biological difference but the differences between men and women in their roles, behaviors, expectations and opportunities, within a social cultural and economic context [6]. More than half (55%) of the respondents were married. Patients either married or unmarried or even divorced do not want to be labeled as TB patient due to the social stigma in developing countries. Most of people try to hide their disease. In the present study majority 59% of the respondents were living in rural area. Rural inhabitants do not have the same level of access to social services, such as health and education facilities and infrastructure as their urban counterpart.

The finding of this study shows that majority of the respondents (58.3%) were knew about DOTS programme, out of that 20% respondent were well educated. TB can be regarded as a symptom of poverty caused by the unequal distribution of resources globally. However, poverty within a society is not distributed equally among its social classes, and among the two sexes. Estimate show that 70% of the world's poor are women [6]. If the patients have good education, they can understand good impact of regular treatment and bad impact of irregular treatment. But who are illiterate, they are simple and innocent but difficult to convince for regular treatment using DOTS. Therefore education plays the vital role in TB treatment.

The result found that most of the respondents were farmers (27.5%) followed by students (24%) and business man (17%). The results are in agreement with the study of Subedi et al. (2004)[7] reporting farm work (21.7%), students (18.3%), and business man (7.5%). TB is a disease found mostly in poor socioeconomic and underprivileged groups. Thus, the disease usually occurs in areas with overcrowded populations such as slums, recreational facilities, refugee camps, and shelters for the homeless, moreover, people whose work may expose them to TB, such as health care workers, are also at higher risk of TB infection and TB disease. Most of the TB patients belong to poor especially in developing countries. They have to work for their every day life. Therefore patients are engaged in different kinds of occupations. In developing countries most of the TB patients are closely associated with farming and labouring. So it is claimed that occupation affects the TB patients to take daily dose medicines using DOTS.

Patients opinion regarding DOTS programme of Nepal majority of them (26%) suggested to

educate TB patients and their family members about tuberculosis such as method of transmission, dose and side effects of medicine, suitable method for disposable of sputum and other materials and what are the consequences, if drug doses are not completed. This study showed that perception about the tuberculosis has been changed positively with the intervention of chemotherapy. Information and communication is the main source of knowledge. For the tuberculosis patient's knowledge on the cause of disease, transmission of disease, diagnosis method, treatment and duration of treatment, side effects of drugs and benefits of DOTS are essential. If the patient has poor knowledge about these subjects, the treatment compliance rate could be poor. As the result, multi drug resistance and mortality rate will be increased. DOTS is the most effective strategy available today for tuberculosis control[4]. It has been suggested that DOTS works better in certain situation/ countries, perhaps not at all in others, depending on local conditions and the level of public administration[8]. Directly observed treatment is an important element in the internationally recommended policy package for TB control. It ensures that a TB patient's takes the right anti-tuberculosis drugs, in the right doses, at the right intervals. Implementation of DOT depends on the setting, facilities, resources and environment. Therefore there must be flexibility in applying directly observed treatment, with adaptation in different districts and countries.

In this study 10% of respondents suggested improve behavior of health care workers. Health care workers role is vital to control tuberculosis. TB patients fully depend on their advice. Their minor mistake or careless creates major problems. Health workers should teach TB patients simple measures how to decrease the risk of transmitting TB. These include covering the mouth with the hand when coughing, dose and side effects of medicine, suitable method for dispose of sputum using sputum pots with lids and what is the consequence if drug doses are not completed. When examining TB patients ask them to turn their head to one side. This is to avoid the patient coughing directly at the health worker.

7.3% of respondents suggested government should provide free balance diet along with free medicine. TB is a disease found mostly in poor socioeconomic and underprivileged groups. In Nepal about 40% of people are under the poverty line [9]. The urban poor are increasing day by day. Most of the TB cases come from the poor society. People cannot afford the travel costs and for other things from their earnings. Migrants are particularly vulnerable to a wide range of communicable infection such as tuberculosis and HIV. They often encounter considerable difficulties in accessing health care and adhering to prescribed treatment regimens. TB control programmes thus face the problems of providing accessible care for migrants with TB and ensuring that patients can complete the treatment. Many migrant groups exist: permanent, temporary and seasonal: voluntary, forced and trafficked; legal and illegal; and internal and international. Migration is predominantly due to economic reasons[4].

CONCLUSION

Tuberculosis treatment programme DOTS provide free of medicines, and ensures that a TB patients takes the right anti-tuberculosis drugs, in the right doses, at the right intervals. This study revealed that majority of patients suggested to educate TB patients and their family members about tuberculosis, such as method of transmission, dose and side effects of medicine, suitable method for disposable of sputum and other materials and what are the result of incomplete treatment. It will help to reduce the transmission of disease and prevent drug resistant cases and improve the efficacy of DOTS programme.

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