Socio-Demographic Factors Associated with Tuberculosis Cases Registered Under RNTCP in an Urban Area of Pune, Maharashtra

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ABSTRACT

Context: Worldwide socio-demographic factors like age, sex, education, occupation, income, life styles etc play a crucial role in etiology, spread and status of tuberculosis. It is a chronic stigmatized social and public health challenge in almost all communities of developing countries.

Objective: This study was undertaken to examine some socio-demographic factors of TB patients in an urban area and their relation with current tuberculosis epidemiological situation.

Materials and methods: It's an observational, cohort study carried on 210 patients. Data was collected by trained personnel in structured and pretested formats from a Tuberculosis Unit and Directly Observed Treatment centers' records and through direct visits and interviews with the patients. The statistical analysis was done by subjecting data to 'EPI INFO' and WIN PEPI software.

Results: Of all 210 patients, 125 were male, 131 had pulmonary TB, 133 in 0-34 year age group, 144 married, 44 illiterate, 96 kaccha house dwellers, 151 experienced overcrowding, 58 smokers (male), 75 had alcohol habit and 51 gave family history of tuberculosis.

Conclusions: TB was significantly higher in males, pulmonary type, in 0-34 year age group, smokers and alcoholics and in those who gave family history of tuberculosis.

Key words: Tuberculosis, socio-demographic factors, marital status, overcrowding, smoking, family history of TB.

INTRODUCTION

Tuberculosis (TB) is an age old infection and disease that affects persons of all socio-economic strata, presenting as a stigmatized social and public health challenge in almost all communities of developing countries and it can attack any organ of human body. [1, 2, 3, 4, 5] After National TB Control Program (1962),[6] and failure of its achievement,[7,8] the government of India with the help of WHO, adopted the newly developed DOTS strategy[9] and initiated Revised National TB Control Program (RNTCP) in phased manner during 1993, which evolved through pilot phase, DOTS strategy, Stop TB Strategy[1,2,3,10,11], the National Strategic Plan[12] and currently, The End TB Strategy [13] with the vision of TB Free World and Goal of TB Elimination by 2035. Since last 3-4 decades, the problems of HIV/ AIDS, MDR/ XDR-TB and adverse TB treatment outcomes have come up as additional challenges for TB control.[10]

During 2015, global incidence and mortality of TB was 10.4 million and 1.4 million respectively and that in India, 2.8 million and 0.48 million respectively. Also, global incidence and mortality for TB with HIV was 11.7 lakh and 3.9 lakh respectively and that for India, 1.1 lakh and 37000 respectively. [14] To negotiate with this situation, government of India has shifted its treatment approach from intermittent DOT (regimen) to daily DOT during 2017. [15] Worldwide socio-demographic factors like

age, sex, education, occupation, income, life styles etc play a crucial role in etiology, spread and epidemiological situation of TB. Various studies on socio-demographic factors of TB patients taking treatment under RNTCP in rural and urban areas are conducted with variable findings. Such kind of study has not been conducted in this study area in the recent past.

So this study was undertaken to find out the profile of socio-demographic factors of TB patients and their relation with current epidemiological status of TB under RNTCP in study area.

METHODOLOGY:

It is an observational and prospective cohort study. An urban field practice area of a private medical college in Pimpri, Pune catering to a population of 1, 10,000 (mostly slum), covered by one Designated Microscopy Center (DMC) with 30 DOT (Directly Observed Treatment) providers under a Tuberculosis Unit (TU) located in a municipal corporation hospital served as the locale for this study. The study period was fixed from 1st July 2011 to 31st March 2014 and data of 210 patients was collected from TU, DMC and DOT centers' records and through interviews with patients, for certain socio-demographic factors, in structured and pretested formats.

The data was collected by trained PG students and medical interns through regular visits. A chronological list of these patients taking treatment in study area, during study period was obtained from TU and data collected as mentioned above and this formed the study cohort. The collected information was compiled, presented in tabular and text form and statistically analyzed by using EPI INFO and 'WIN PEPI' software to examine the relation between various saocio-demograhic factors of patients and the epidemiological situation of TB under RNTCP. Operational Definitions for New case, Sputum positive, Sputum Negative, Extra pulmonary TB, Retreatment case etc were obtained from standard available sources and utilized for this study. [1, 3, 4, 10] The written informed consent was obtained from these patients before interview and the institutional ethical committee approval was obtained before initiation of study.

RESULTS

Table 1 reveals that, of all 210 study subjects (patients), 125 (60%) were male and remaining 85 (40%) female. Amongst all, 131 (62%) were pulmonary and remaining 79 (38%) belonged to extra pulmonary group. These proportions amongst male and pulmonary groups are statistically highly

significant as P=0.006. Table 2 shows that, 133 (63.33%) patients belonged to 0-34 year age group and remaining 77 (36.67%) to age group 35 years and above, however this difference is not significant as P=0.665. According to table 3, of the total patients, 32 (15.24%) had TB with HIV, of whom 21 were male and 11 female, 17 were of the age up to 34 years and rest 15 were above the age of 34. These differences in age and sex distribution of patients with TB and HIV are statistically not significant as P=0.625.

Table 4 reveals that out of all study patients, 126 (60%) were pulmonary and remaining 40% extra pulmonary. Amongst 126 pulmonary patients, about 34% were smokers, 43% had alcohol habit and 31% gave family history of TB and amongst 84 extra pulmonary subjects, the proportions of these three groups were about 18%, 27% and 18% respectively and these differences were statistically significant as their respective 'P' values were 0.015, 0.033 and 0.049. Also amongst pulmonary subjects, about 21% were joint family members, 69% married, 19% illiterate, 48% kaccha house dwellers and 70% experienced residential overcrowding. Similarly in extra pulmonary group, the corresponding proportions were about 17%, 68%, 24%, 43%, and 75% respectively, however these differences were statistically not significant as their 'P' values were 0.500 or more (Table 4).

Table-1: Distribution of all (210) prospective study subjects (TB patients) by gender and type of TB

Gender	Pulmonary TB (%)	Extra pulmonary TB (%)	Total (%)
Male	88 (70.40)	37 (29.60)	125 (59.52)
Female	43 (50.59)	42 (49.41)	85 (40.48)
Total	131 (62.38)	79 (37.62)	210 (100)

X^2= 7.639, DF= 2, 'P'= 0.006. Odds Ratio=2.32 (CI 95%=1.30 – 4.13)

Table-2: Distribution of all (210) study subjects (TB patients) by age group and type of TB

Age group (years)	Pulmonary TB (%)	Extra pulmonary TB (%)	Total (%)
Up to 34	81 (60.90)	52 (39.10)	133 (63.33)
35 and above	50 (64.94)	27 (35.06)	77 (36.67)
Total	131 (62.38)	79 (37.62)	210 (100)

X2= 0.188, DF= 2, 'P'= 0.665

Table-3: Age group and gender wise distribution of TB with HIV positive 32 (15.24%) cases

Age group	Male (%)	Female (%)	Total (%)
Up to 34	10 (58.82)	7 (41.18)	17 (53.13)
35 and above	11 (73.33)	4 (26.67)	15 (46.87)
Total	21 (65.63)	11 (34.37)	32 (100)

X^2=0.240, DF=1, 'P'=0.625

Table-4: Distribution of TB patients (210) by their attributes and type of TB

Variables/ Attributes	Pulmonary (N=126)		Extra pulmonary (N=84)		X^2	'P' value
	Yes	No	Yes	No		
Smoking	43 (34.13)	83 (65.87)	15 (17.86)	69 (82.14)	5.885	**0.015**
Alcohol	54 (42.86)	72 (57.14)	23 (27.38)	61 (72.62)	4.553	**0.033**
F H/O TB*	39 (30.95)	87 (69.05)	15 (17.86)	69 (82.14)	3.865	**0.049**
Family type: joint	27 (21.43)	99 (78.57)	14 (16.67)	70 (83.33)	0.456	0.500
Married	87 (69.05)	39 (30.95)	57 (67.86)	27 (32.14)	0.001	0.976
Illiterate	24 (19.05)	102 (80.95)	20 (23.81)	64 (76.19)	0.432	0.511
Kaccha house	60 (47.62)	66 (52.38)	36 (42.86)	48 (57.14)	0.289	0.591
Overcrowding	88 (69.84)	38 (30.16)	63 (75.00)	21 (25.00)	0.433	0.510

*F H/O TB: Family History of TB
Odds Ratio: smoking= 2.38 (CI@ 95%= 1.22 – 4.65), alcohol abuse= 1.99 (CI@95%= 1.10 – 3.61)
F H/O TB = 2.06 (CI@95% = 1.05 – 4.05)

DISCUSSION

Gender and Type of TB: According to table 1, the proportions of male, female patients as 60% and 40% respectively and that of pulmonary and extra pulmonary groups as 62% and 38% respectively show highly significant difference as P=0.006. In a study by Mohammad Tahir et al,[16] the proportion of male patients was about 151 (57%) and remaining 115 (43%) female, these being comparable with present study. In Ernakulum study by Nirupa C et al [17] on 285 patients, 68% were male and rest 32% females and this proportion in males is higher than that of present study and these differences could be due to regional and cultural differences. Only 11.43% (24) in present study, were above 55 years of age whereas Raviglione et al [18] in their study in Europe revealed that, there were 70% patients above the age of 65, which could be because of higher proportion of elder population in Europe with co-morbidities like Diabetes Mellitus, Cardio Vascular Disease, malignancy etc, which act as risk factors for TB. The higher proportions of male in almost all of the above studies could be because of their higher chances of exposure to sources of TB infection.

Age groups and disease class: Table 2 reveals that of all 210 patients, about 63% belonged to age group 'up to 34 years' and remaining 37% to age group 35 years and above. This difference in age groups along with that in pulmonary and extra pulmonary groups is statistically not significant as 'P'= 0.665. Also in pulmonary group, about 61% belonged to 'up to 34' year age group and about 70% were male. In a study by Saleem M et al[19] on 167 pulmonary TB patients, the proportion of patients belonging to age group 'up to 34' years was about 68% and that of male was 72%, both of which are comparable with present study.

TB with HIV: According to table 3, out of total 210 TB patients, 32 patients (15.24%) had TB with HIV, of whom 66% were male and 34% female and of all, 17 (53%) belonged to age group 'up to 34' years

and remaining 47% were above 34 years. These differences in age and sex distribution are statistically not significant as 'P'=0.625. In a study by B Bhushan et al [20] at Amritsar (Punjab), they found that 5.3% of TB patients were HIV positive, which is quite lower than that of present study and it could be due to different epidemiological HIV status in two states, Maharashtra being a HIV high prevalence state and Punjab, a HIV low prevalence state.[21]

Socio-demographic factors: Variables like smoking, alcohol habit, family history of TB, family type, marriage, literacy, housing, overcrowding, were dichotomized so as to 'yes' or 'no' and compared amongst pulmonary and extra pulmonary TB patients' groups. Table 4 reveals that, of the 210 study patients (126 pulmonary and 84 extra pulmonary), the proportion of smokers was 34% (43) in pulmonary as compared 18% (15) in extra pulmonary TB and this difference was statistically significant as P=0.015. Similarly, proportions of patients with alcohol habit in pulmonary and extra pulmonary groups were about 43% and 27% respectively and this difference was statistically significant as P=0.033. Also, proportion of patients with family history of TB (F H/O TB) was about 31% and 18% in pulmonary and extra pulmonary groups respectively and this difference was statistically just significant as P=0.049. In a Deharadun study by Gambhir et al, [22] 57.8% pulmonary TB patients were smokers as compared to 34% in present study. According to a study in South Africa, [23] TB was associated with male sex, HIV infection, smoking, history of asthma, family history of TB and adult overcrowding. In a Kampala; Uganda study,[24] the prevalence of TB risk factors was as follows: HIV 41.4%, diabetes 5.4%, close contact of TB 11.5%, family history 17.5%, smoking 26.37%, poverty 39.5%, overcrowding 57.3% and alcohol use 50.7%. These differences in above mentioned various studies amongst themselves and in comparison with present study could be due to regional and cultural differences in different communi-

ties. Differences in remaining variables (family type, marriage, literacy, housing, overcrowding), between pulmonary and extra pulmonary groups were statistically not significant as their X^2 values were below 3.84 and P values more than 0.05. In a study by Saleem M et al [19] on 167 pulmonary TB patients the proportion of married patients was about 83%, and that of illiterate 20%, both are comparable with pulmonary group of present study. Pooja Sadana et al [25] in their study found that, patients experiencing overcrowding were 79.82% which is higher than present study (69.84%). A K Chakraborty study [26] reveals that, the proportion of illiterate patients was 34.7%, which seems quite higher than present study, which could be due to regional and socio-cultural differences in those communities. In a study by Jha A, [27] the proportion of kaccha house dwellers was 45.7% and in a rural Aligarh study by Q H Khan,[28] there were 40% patients residing in kaccha houses and both of these are comparable with the findings of present study.

CONCLUSIONS

Amongst all 210 study patients, the proportion of TB is found to be significantly higher in male, in pulmonary TB group and in age group 'up to 34' years when compared with their counterparts. The proportion of HIV positivity in present study is about 15% (32), which seems to be quite higher, even though study area is in a state recognized as 'HIV high prevalence state (Maharashtra)'; this needs further studies to probe the situation. The study area Pimpri, Pune is highly industrialized and holds considerable high risk and bridge population for HIV transmission. Similarly, proportions of patients with history of smoking, alcohol abuse and family history of TB in pulmonary group was found to be significantly higher than extra pulmonary group.

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