

SOCIO-EPIDEMIOLOGICAL CHARACTERISTICS AND TREATMENT OUTCOME OF ADULT TUBERCULOSIS PATIENTS UNDER DIRECTLY OBSERVED TREATMENT SHORT COURSE IN LUDHIANA CITY

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ABSTRACT

BACKGROUND

Tuberculosis is a serious public health problem causing immense morbidity, mortality and distress to individuals, families and communities. The treatment behaviour of patients is complex and dynamic. Several epidemiological factors may shape the behaviour till the final outcome. The present study was conducted with an objective to study the socio-epidemiological characteristics and treatment outcome in adult tuberculosis patients on Directly Observed Treatment Short course (DOTS) in Ludhiana city.

MATERIALS AND METHODS

A community based Prospective Cohort study was conducted in the two Tuberculosis Units (TU) of Ludhiana city. A total of 221 registered DOTS patients were taken as study subjects and followed during the course of treatment to observe their treatment outcome. The information was collected on a pre-designed semi-structured questionnaire through personal interviews.

RESULTS

Out of 221 subjects, 142 (64.3%) were male, 132 (59.7%) were below the age of 35 and majority 118 (53.4%) were from lower middle socioeconomic group, 118 (53.4%) subjects were sputum positive. Among new sputum-positive subjects, 68 (80.0%) were cured, 93 (42.5%) completed treatment, 26 (11.8%) defaulted, 6 (2.7%) died and 3 (1.4%) had treatment failure.

CONCLUSION

One of the objectives under RNTCP is to achieve a cure rate of at least 85% among new sputum smear positive cases, but it was 80.0% in the present study. A high default rate (11.8%) was also found as compared to other studies.

KEYWORDS

DOTS, Treatment Outcome, Socio-epidemiological Characteristics.

HOW TO CITE THIS ARTICLE: Bagga RV, Sharma S, Soni RK, et al. Socio-epidemiological characteristics and treatment outcome of adult tuberculosis patients under directly observed treatment short course in Ludhiana city. J. Evolution Med. Dent. Sci. 2017;6(18):1397-1400, DOI: 10.14260/Jemds/2017/305

BACKGROUND

Tuberculosis has been recognised as a scourge of humanity since antiquity. World Health Organization report (1990) on global burden of diseases ranked tuberculosis as seventh most morbidity causing disease in the world and expected it to continue in the same position up to 2020.^[1] Tuberculosis still remains one of the major public health problems facing mankind, particularly in developing countries. It has been reported that 95% of TB cases and 98% of TB deaths occur in developing countries.^[2] India is 17th among 22 high burden countries in terms of TB incidence rate.^[3] Around 5000 develop disease daily and there is one death every 1½ minutes because of TB.^[4]

It is clear that the burden of Tuberculosis disease is huge in terms of physical, psychological, economic and social aspects indicating that the effect of the disease is manifold. This indicates that the effect of the disease needs to be studied not just on physical dimension but all other dimensions as they also have a great impact on treatment outcome and overall well-being of patients. Treatment outcome is an important indicator of TB control programs, and monitoring and evaluation of treatment outcomes of TB patients is an integral part of the DOTS strategy. Therefore, the present study was planned to ascertain the various socio-epidemiological characteristics of adult TB patients who were under DOTS and to study the treatment outcome in these patients.

MATERIALS AND METHODS

A community based prospective cohort study was conducted in Ludhiana city. Total population of Ludhiana city was 14,98,881. District Tuberculosis Centre acts as a nodal agency and for the purpose of RNTCP implementation in the city, it has been divided into two Tuberculosis Units (TU), TU-ESI and TU-DTC. TU-DTC covers a population of 7,74,486 and has 77 DOTS centres, while TU-ESI caters to a population of 7,24,395 and has 83 DOTS centres.^[5] The present study was

Financial or Other, Competing Interest: None.

Submission 08-02-2017, Peer Review 20-02-2017,

Acceptance 23-02-2017, Published 02-03-2017.

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DOI: 10.14260/Jemds/2017/305



conducted in both the Tuberculosis Units (TU) of Ludhiana city. From that list, a total of ten DOTS centres, 5 from each TU, were selected randomly (by lottery method).

The period of study was from 1st April, 2010 to 31st March, 2011. All the patients above the age of 15 years, registered in the 1st quarter of the study period i.e. 1st April, 2010 to 30th June, 2010, in the selected DOTS centres formed the study subjects. Addresses of the subjects were taken from the records maintained at the DOTS centres. Altogether three visits were done for each subject (including two home visits and one visit at the DOTS centre). Two home visits were conducted with the help of DOTS provider, TBHV (Tuberculosis Health Visitor) or STS (Senior Treatment Supervisor). The first home visit was done to gather information regarding epidemiological characteristics, socioeconomic status, health status and to assess environmental conditions. Total subjects enrolled for the study were 224 out of which 221 could be interviewed during the first visit. There were 3 subjects who could not be interviewed during the first visit as either the house was found locked or subject was not available. Three more attempts were made to contact these subjects and as they were still not available, so they were excluded from the study. After the completion of Intensive Phase (IP) of treatment, a second visit was done at DOTS centre and study subjects were interviewed to know compliance, status of sputum examination, side effects and improvement in symptoms, etc. Finally, a third visit at the end of the treatment was done at home to know the change in weight, status of sputum examination and to ascertain the treatment outcome.

The treatment outcome was categorised into Cured, Treatment Completed, Died, Defaulted, Failed and Transferred out. The information was collected on a pre-designed semi-structured questionnaire by the investigator through personal interviews. The data entry was done using Microsoft excel 2007 and data was analysed using Epi Info version 3.3.2. Results were tabulated in percentages and proportions.

RESULTS

Parameter	Number	Percentage
Age (Years)		
15-24	75	33.9
25-34	57	25.8
35-44	36	16.3
45-54	22	10.0
>55	31	14.0
Gender		
Male	142	64.3
Female	79	35.7
Ethnicity		
Native	124	56.1
Migrant	97	43.9
Religion		
Hindu	162	73.3
Sikh	57	25.8
Muslim	02	0.9
Caste		
Scheduled	92	41.6
Non-Scheduled	129	58.4

Marital Status		
Married	130	58.8
Unmarried	81	36.7
Widow/Widower/ Divorced/Separated	10	4.5
Education		
Illiterate	51	23.1
Primary	26	11.7
Middle	74	33.5
Matric	37	16.7
10+2	22	10.0
Graduate	10	4.5
Postgraduate	01	0.5
Occupation		
Service	37	16.7
Labourer	68	30.8
Business	13	5.9
Student	17	7.7
Unemployed	31	14.0
Housewife	43	19.5
Others	12	5.4
Type of family		
Nuclear	153	69.2
Joint	68	30.8
SES*		
Low	13	5.9
Low Middle	118	53.4
High Middle	86	38.9
High	04	1.8

Table 1. Distribution of subjects according to Socio-demographic characteristics (N=221)

*As per Modified Udai Pareek Scale

In a total of 221 subjects interviewed, 168 (76.02%) subjects were in age group 15-44 years. It was observed that 142 (64.3%) of subjects were male and 79 (35.7%) were female. Mean age in males was 35.16 ± 14.77 as compared to 31.27 ± 15.04 in females. More than half (56.1%) were natives of Punjab, while 43.9% were migrants i.e. belonging to states other than Punjab. Majority (73.3%) of the subjects were Hindus, followed by Sikh (25.8%) and Muslims (0.9%). More than half of males (57.8%) and females (60.8%) were married. 51 (23.1%) of the subjects were illiterate and 70 (31.7%) had education up to matric and above. Maximum number of subjects were educated for 8 years. 68 (30.8%) were labourers and 31 (14.0%) were unemployed. About half (49.3%) of subjects had five to ten members in their family. Majority of subjects (92.3%) were from middle socio-economic group.

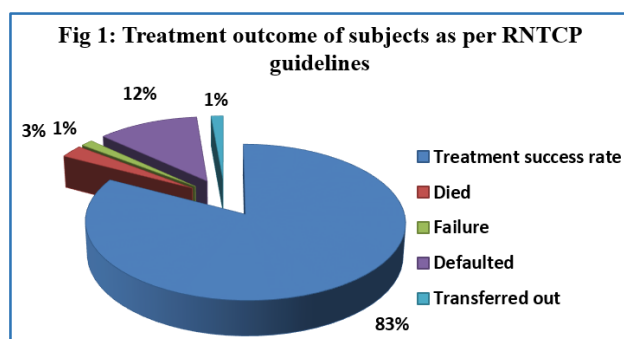
In the present study, 140 (63.4%) belonged to Category-I, 48 (21.7%) to Category-II, while 33 (14.9%) belonged to Category-III treatment. 166 (75.1%) subjects were classified as suffering from pulmonary tuberculosis, out of which 71.1% were sputum smear positive and 28.9% sputum negative, 55 (24.9%) were extra-pulmonary subjects. Majority of the subjects (77.8%) were new, 10.4% and 6.3% were relapse and treatment after default cases respectively. Cure rate was 76.3% among all sputum-positive subjects and 80.0% among new sputum-positive (NSP) subjects.

Type of TB Patient	Cured	Treatment Completed	Defaulted	Failure	Died	Transferred Out	Total
A. New cases							
Smear Positive:							
Pulmonary	68	01	13	01	01	01	85
Smear Negative:							
Pulmonary	00	32	04	00	01	00	37
Extrapulmonary	00	48	01	00	01	00	50
Subtotal	68	81	18	01	03	01	172
B. Re-treatment Cases							
Smear Positive:							
Relapse	14	03	03	02	00	01	23
Failure	00	01	00	00	00	00	01
TAD*	08	01	03	00	01	01	14
Others	00	07	02	00	00	00	09
Transfer in	00	00	00	00	02	00	02
Subtotal	22	12	08	02	03	02	49
Grand Total (A + B)	90	93	26	03	06	03	221

Table 2. Distribution of subjects according to Treatment Outcome (N = 221)

*TAD – Treatment after default

Table 2 illustrates the treatment outcome of 221 subjects under study. Treatment success rate was 82.8% (183 out of 221), cure rate was 80.0% (68 out of 85 new smear positive subjects), default rate was 11.8% (26 out of 221), death rate was 2.7% (6 out of 221), failure rate and transferred out rate was 1.4% each (3 out of 221).



DISCUSSION

TB primarily affects people in their most productive years of life with important socio-economic consequences for the household. The disease is even more common among the poorest and marginalised sections of the community. Almost 70% of TB patients are between the age of 15 and 54 years. In the present study, 86.0% subjects belonged to age group 15-54 years. The age wise distribution is in consonance with various studies.

Community-based epidemiological studies have established that males have a higher prevalence of TB infection and a higher rate of progression from infection to active disease than females.^[6] The gender wise distribution shows that 64.3% of subjects were male and 35.7% were female. TB takes a disproportionately larger toll among young females, with more than 50% of female cases occurring before 34 years of age.^[3] In the present study, 68.4% females were less than 35 years of age as compared to 55% of males in the same age group.

The religion wise distribution of subjects shows that majority (73.3%) of the subjects were Hindus which is in accordance with the findings of a study on effectiveness of DOTS on Tuberculosis patients by Masthi et al (2006)^[7] where 71.59% subjects were Hindus.

In the present study, it was seen that 58.8% of the subjects were married, 36.7% were unmarried, 3.2% were either a widower or widow and 1.3% were either divorced or separated which is almost similar to the findings of Sophia et al (2004)^[8] where 59.4% subjects were married. Jaggarajamma et al (2008)^[9] reported that 71% subjects were married and 29% were unmarried.

It was observed that 23.1% of the subjects were illiterate, 11.7% subjects had education up to primary level, 33.5% subjects were educated up to middle, 16.7% subjects up to matric and 10.0% subjects up to 10+2, while only 4.5% were graduates and 0.5% subjects were postgraduates. Maximum number of subjects were educated for 8 years.

However, Kaur et al (2008)^[10] reported that 36.9% subjects were illiterate, 15.9% were educated up to primary, 18.5% up to middle, 16.2% up to high school, 7.2% up to senior secondary and 4.2% were graduates, while Chadha and Bhagi (2000)^[11] and Sophia et al (2004)^[8] reported 39% and 29.2% illiterate subjects respectively.

In the present study, 69.2% subjects were staying in nuclear family which is in accordance with observation made by Masthi et al (2006)^[7] where 69.3% of patients were from nuclear families. Average household size in the present study is 4.96 which is similar (4.6) to that reported by Moharana et al (2009).^[12]

By the turn of 20th century, the concept of SES-health gradient got established i.e. relative risk of mortality or morbidity from a particular disease increases at a relatively constant rate with decreasing SES. In the present study, 53.4% of subjects were from lower middle socioeconomic group which is similar to findings of Gupta et al (2004) where 52% were from lower middle class.^[13]

Treatment success rate in the present study was 82.8%, cure rate was 80.0% among new sputum smear positive subjects, default rate was 11.8%, death rate was 2.7% and both failure and transferred out rates were 1.4% each. Cure rate among new smear positives was calculated to be 80.0% whereas; one of the objectives under RNTCP is to achieve a cure rate of at least 85% among new sputum smear positive cases. The cure rates documented by Jaggarajamma et al (2007)^[9] and Moharana et al (2009)^[12] are 79.0% and 78.2% which are almost similar to the findings of the present study.

In contrast, Kaur et al (2008)^[10] reported a cure rate of 97.9%.

Treatment success rate was 82.8% in the present study which is comparable with treatment success rate of 83.4% documented by Chennaveerappa et al (2011)^[14] in Hassan. Whereas Shanta et al (2002),^[15] Sophia et al (2004)^[8] and Jaggarajamma et al (2007)^[9] showed lower treatment success rates of 72.0%, 67.9% and 71.0% respectively.

In the present study, the default rate was 11.8% which is higher than 1.1% and 6.8% documented by Kaur et al (2008)^[10] and Moharana et al (2009)^[12] respectively. However, Sophia et al (2004)^[8] and Jaggarajamma et al (2007)^[9] observed a higher default rate of 24.7% and 20.0% respectively.

Death rate among study subjects was 2.7% which was 2.2% and 3.0% in studies conducted by Sophia et al (2004)^[8] and Jaggarajamma et al (2007) respectively.^[9] Failure rate was 1.4% in the present study which is similar (1.6%) to the findings of Chadha and Bhagi (2000).^[11]

CONCLUSION

The study evaluated the treatment outcome in adult tuberculosis patients on DOTS in Ludhiana city. Cure rate was 76.3% among all sputum-positive subjects and 80.0% among new sputum-positive (NSP) subjects. Treatment success rate of adult tuberculosis patients in Ludhiana city was 82.8%, which is low as per RNTCP norms. The default rate was 11.8% which is higher than national average.

Recommendations

Keeping in mind the default rate of the present study, initial counselling by health personnel explaining the treatment plan before starting the treatment, periodic motivation of patients and prompt defaulter retrieval action would be beneficial. Providing DOTS as per patient's convenience with periodic monitoring may reduce default rate. Further availability of some medicines for treating side-effects should be ensured, as side-effects following treatment is a major problem among patients. In-depth operational research studies are needed to increase compliance of the patients.

Acknowledgement

We are thankful to District TB Officer, Ludhiana and staff of DTC for helping us during the study. We are also grateful to all the patients for their support and cooperation.

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