

Occurrence of Tuberculosis in Patients Attending a Tertiary Care Hospital in Khanpur, Sonapat, Haryana

Sumit Kumar¹, Surinder Kumar², Pallavi Kumari³, Pallavi Sayal⁴, Seema Garg⁵, Raminder Sandhu⁵

¹Associate Professor, Department of Microbiology, BPS Government Medical College for Women, Sonapat, Haryana, India, ²Professor & Head, Department of Microbiology BPS Government Medical College for Women, Sonapat, Haryana, India, ³Associate Professor, Department of Physiology, Teerthanker Mahaveer Medical College & Research Center, Moradabad, Uttar Pradesh, India, ⁴Tutor, Department of Microbiology BPS Government Medical College for Women, Sonapat, Haryana, India, ⁵Assistant Professor, Department of Microbiology BPS Government Medical College for Women, Sonapat, Haryana, India

Abstract

Background: Tuberculosis (TB) is a major public health problem in India, estimated 2.3 million new cases annually makes it the highest TB burdened country. In 2010, India has estimated one-quarter (26%) of all TB cases worldwide. India has more TB cases annually than any other country globally, with estimated disease prevalence 256/100,000 population, the incidence of 185/100,000 and death of 26/100,000. The prevalence of TB is an important epidemiological index to measure the burden in a community.

Materials and Methods: A study was conducted on patients attending BPS, Government Medical College (GMC) (women), Khanpur, Sonapat, Hospital. Clinically TB suspected cases were investigated in the Department of Microbiology by staining the sputum samples by Ziehl–Neelsen staining and smears were examined by direct microscopy.

Results: The patients attended to BPS, GMC (women), Khanpur, Sonapat hospital during January 2015 to December 2015 were screened, and 4267 patients were suspected for TB. Out of 4267 patients, 528 (12.37%) were smear positive. Out of 528 positive cases, 402 (76.14%) were male and 126 (23.86%) were female. A maximum number of cases 101 (19.13%) were positive in 41-50 years group.

Conclusions: This study provides important information on TB status in Sonapat, Haryana. It can serve as baseline data for future evaluation, the impact of disease control measures and epidemiological trends. However, TB is a major public health problem, and there is need to maintain and further strengthen TB control measures on a sustained and long-term basis. Epidemiological information on TB has always been vital for planning control strategies and has now gained further importance for monitoring the impact of interventions against the disease.

Key words: Burden, Epidemiological, Occurrence, Tuberculosis

INTRODUCTION

Tuberculosis (TB) is still a major public health problem in India, with an estimated 2.3 million new cases annually that making it the highest TB burden country in the world. In 2010, India alone accounted for an estimated one-quarter (26%) of all TB cases worldwide.¹

India has more TB cases annually than any other country in the world, with an estimated disease prevalence of 256/100,000 population, incidence of 185/100,000 and deaths of 26/100,000.² TB is responsible for as many as 29 deaths per year per 100,000 people. In a country with over a billion people, this translates to as many as 290,000 deaths in a year. With a reported prevalence of 283 cases per 100,000 population, India is among the 22 high TB burden countries in the world.⁴

Currently under Revised National TB Control Programme (RNTCP), any person presenting with a cough of more than 2 weeks is screened for pulmonary TB (PTB) by two sputum smear examinations, one spot and one overnight

Access this article online



www.ijss-sn.com

Month of Submission : 05-2016
Month of Peer Review : 06-2016
Month of Acceptance : 07-2016
Month of Publishing : 07-2016

Corresponding Author: Dr. Sumit Kumar, Department of Microbiology, BPS Government Medical College for Women, Khanpur Kalan, Sonapat - 131 305, Haryana, India. Phone: +91-8396069442. E-mail: drsumitkumar.india@gmail.com

sample. The samples are collected and examined at designated microscopic centers. The treatment of TB patients is based on the internationally recommended directly observed treatment short course strategy.²

Different studies across the country have estimated a prevalence of smear-positive PTB between 60 and 760/100,000 population, culture positive TB between 170 and 980, and culture and/or smear-positive prevalence between 180 and 1270/100,000 people.⁴

The prevalence of TB disease is an important epidemiological index to measure the burden in a community and if it is measured periodically, will enable trends in disease prevalence to be observed over time. Epidemiological information on TB is also vital for the planning of control strategies and service delivery systems.¹

In view of low health service coverage, a developing diagnostic network, and a weak disease notification system, it is not only difficult to determine the magnitude of TB from case notification alone but it is also impossible to monitor the effectiveness of control measures.⁴

Global targets for TB control now include a 95% reduction in TB deaths and <10 cases per 100,000 population by 2035. Such targets will be achieved by strategies to diagnose and treat people with active TB earlier in their disease course.⁴⁻¹⁰

This study was conducted in BPS Medical College, Khanpur, Sonapat to know the occurrence of TB.

MATERIALS AND METHODS

The study was conducted in the Department of Microbiology during January 2015 to December 2015 on patients attending BPS, Government Medical College (GMC) for women, Khanpur Kalan, Sonapat, Hospital. A history of the patient was taken. Individuals were questioned for chest symptoms relating to TB, namely: Persistent cough for 2 weeks or more, chest pain for 1 month or more, fever for 1 month or more, and hemoptysis anytime in last 6 months. History of TB treatment, alcohol consumption, tobacco smoking were collected. Persons with any of these symptoms (deemed as “chest symptomatics”), and also those with a previous history of anti-TB treatment, were considered eligible for sputum collection. Two sputum samples - one spot and one overnight - were collected from each eligible individual in a sterilized container.

Sputum smears were prepared directly from each sputum specimen, and also from concentrated samples. Two direct

smears were made from each specimen on new labeled slides under aseptic conditions in a bio-safety cabinet. Smears were stained using Ziehl–Neelsen stain and examined with oil-immersion microscopy for the presence of acid-fast bacilli (AFB). About 10% of randomly selected sputum smears were cross-examined by one of the investigators (SS), and quality assurance protocols were followed as per RNTCP guidelines. A TB case was defined as an individual in whom any of the two sputum specimens was positive for AFB by Ziehl–Neelsen microscopy. All bacteriologically positive cases were referred to the concerned health authorities for anti-TB treatment under the RNTCP using its standardized treatment regimens.

RESULTS

The patients attended to BPS, GMC for Women, Khanpur Kalan, Sonapat Hospital during January 2015 to December 2015 were screened for TB. A history of the patient was taken. Individuals were questioned for chest symptoms relating to TB, namely: Persistent cough for 2 weeks or more, chest pain for 1 month or more, fever for 1 month or more, and hemoptysis anytime in last 6 months. History of TB treatment was taken. 4267 patients were suspected for TB. Sputum samples of suspected patients were collected. Two sputum samples - one spot and one overnight - were collected from each eligible individual in sterilized container. Two direct smears were made from each specimen on new labeled slides under aseptic conditions in a bio-safety cabinet. Smears were stained using Ziehl–Neelsen stain and examined with oil-immersion microscopy for the presence of AFB.

Out of 4267 patients suspected for TB 528 (12.37%) cases were smear-positive. Out of 528 smear, positive cases 402 (76.14%) were males and 126 (23.86%) were females. In this study, a maximum number of cases 101 (19.13%) were positive in 41-50 years group.

DISCUSSION

TB is still a major public health problem in India. This study was conducted in BPS, Medical College, Khanpur, Sonapat, to know the occurrence of TB. The patients attended to BPS, GMC(women) Khanpur, Sonapat Hospital during January 2015 to December 2015 were screened for TB.

In this study, 4267 patients were suspected for TB. Out of 4267 patients, 528 (12.37%) were smear positive.

In a study done by Sharma *et al.*, in 2015, a total of 81 (4.4%) sputum samples were found smear positive while 82 (4.4%) were culture positive. 63 (3.4%) subjects were both smear and culture positive.⁴ In a study done by

Table 1: Occurrence of tuberculosis according to age and gender

Age	Male (%)	Female (%)	Total (%)
11-20	21 (3.97)	22 (4.16)	43 (8.14)
21-30	66 (12.50)	34 (6.44)	100 (18.94)
31-40	65 (12.31)	11 (2.08)	76 (14.39)
41-50	86 (16.28)	15 (2.84)	101 (19.13)
51-60	69 (13.06)	17 (3.21)	86 (16.28)
61-70	71 (13.44)	17 (3.21)	88 (16.66)
71-80	15 (2.84)	8 (1.51)	23 (4.35)
81-90	9 (1.70)	2 (0.38)	11 (2.08)
Total	402 (76.14)	126 (23.86)	528 (100)

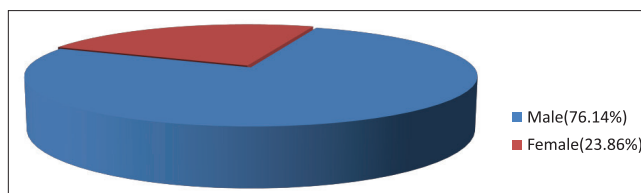
Rao *et al.*, in 2012, PTB was found to be 255.3/100,000 population.¹ In a study done by Yadav *et al.*, in 2010, TB prevalence was 146/100,000.¹ In a study done by Rao *et al.*, in 2010, TB prevalence was 1518/100,000.¹ In a study done by Bhat *et al.*, in 2009, TB prevalence was 387/100,000.⁶ In a study done by Chakraborty 2004, the prevalence of total PTB cases was 20.0/1000.¹² In a study done by Chakma *et al.*, in 1996, TB prevalence was 12.7/100,000 population of Morena district of Madhya Pradesh.¹

TB occurrence rates could not be similar between areas in India. This is due to the regional diversities in terms of ethnic, economic, cultural complexities and variables, pervading the vast land masses and the population size of near continental dimensions.¹²

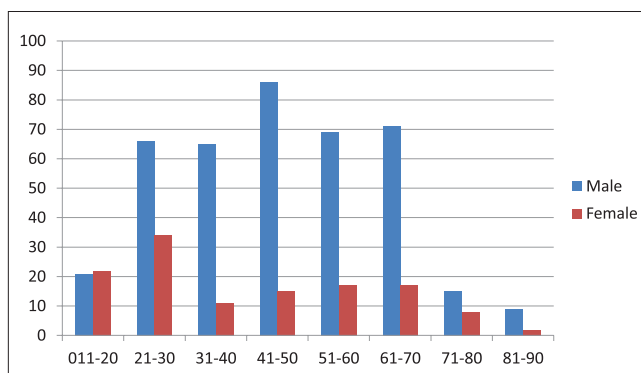
In this study out of 528 positive cases, 402 (76.14%) were male and 126 (23.86%) were female. In a study done by Aggarwal *et al.*, in 2015, TB was more among men (34.5/100,000) as compared to women (14.2/100,000).⁵ In a study done by Bhat *et al.*, in 2012, males contributed 76.9% of the total bacteriologically positive PTB cases.¹ In a study done by Chadha *et al.*, in 2012, male to female ratio in these surveys has been found to vary between 2:1 and 5:1. It was 6:1 during the present survey.³ In a study done by Gopi *et al.*, in 2010, the prevalence of PTB in males (2156/100,000) was more than double that among females (933/100,000).⁹ In a study done by Bhat *et al.*, in 2009, the prevalence of bacillary TB was more than double among males (554/100,000) than females (233/100,000).⁶

In general, the disease occurrence rates are about similar in both sexes, till the puberty in females. This is followed by a continuing widening of the gap between the sexes in favor of the females, the differences acutely accentuated past the 35-40 years age mark.¹²

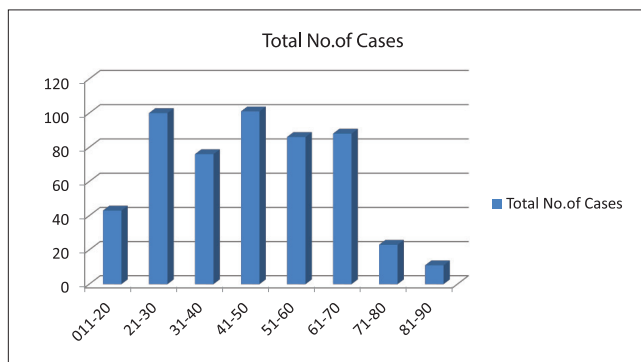
In this study, a maximum number of cases 101 (19.13%) were positive in 41-50 years group. In a study done by Dhanaraj *et al.*, in 2015, while the maximum prevalence of bacteriologically positive PTB 1241/100,000 was found in the age group of 55-64 years.² In a study done by Bhat



Graph 1: Tuberculosis according to gender



Graph 2: Tuberculosis in relation to gender and age



Graph 3: Tuberculosis in relation to age

et al., in 2012, the highest proportion of positive PTB cases (25.8%) was seen in the 35-44 years age group.¹ In a study done by Rao *et al.*, in 2010, the prevalence increased with age, being 546/100,000 in the 15-24 years age group, increasing to 3086/100,000 in the 55+ years age group.⁹ In a study done by Bhat *et al.*, 2009, the prevalence increased with age being 174/100,000 in the 15-24 years age group to 990/100,000 in the 55+ years age group.⁶

It was observed that, of the prevalent cases in the community, the age-wise proportion of cases were substantially higher 35-44 years onward, to be at the peak for the age group 55-64 years (28.40%).¹² The occurrence of TB rise with age, in both sexes (Table 1 and Graphs 1-3).^{12,13}

CONCLUSIONS

This study provides important information on TB status in Khanpur Kalan, Sonapat, Haryana. The study indicates

high occurrence of TB in males they were affected more in 76.14% cases and female were affected in 23.86% cases. Maximum affected age group was between 41 and 50 years. The study results provide vital information on the TB disease situation among the population and can serve as baseline data for future evaluation of the impact of disease control measures and epidemiological trends. The findings suggest that the TB situation among the Khanpur, Sonipat, population is not that different from the situation among the population in the country.

However, TB remains a major public health problem among the population, and there is a need to maintain and further strengthen TB control measures on a sustained and long-term basis. Epidemiological information on TB has always been vital for planning control strategies and has now gained further importance for monitoring the impact of interventions against the disease.

REFERENCES

1. Rao VG, Bhat J, Yadav R, Gopalan GP, Nagamiah S, Bhondeley MK, *et al.* Prevalence of pulmonary tuberculosis - A baseline survey in central India. *PLoS One* 2012;7:e43225.
2. Dhanaraj B, Papanna MK, Adinarayanan S, Vedachalam C, Sundaram V, Shanmugam S, *et al.* Prevalence and risk factors for adult pulmonary tuberculosis in a metropolitan city of South India. *PLoS One* 2015;10:e0124260.
3. Chadha VK, Kumar P, Anjinappa SM, Singh S, Narasimhaiah S, Joshi MV, *et al.* Prevalence of pulmonary tuberculosis among adults in a rural sub-district of South India. *PLoS One* 2012;7:e42625.
4. Sharma SK, Goel A, Gupta SK, Mohan K, Sreenivas V, Rai SK, *et al.* Prevalence of tuberculosis in Faridabad district, Haryana State, India. *Indian J Med Res* 2015;141:228-35.
5. Aggarwal AN, Gupta D, Agarwal R, Sethi S, Thakur JS, Anjinappa SM, *et al.* Prevalence of pulmonary tuberculosis among adults in a north Indian district. *PLoS One* 2015;10:e0117363.
6. Bhat J, Rao VG, Gopi PG, Yadav R, Selvakumar N, Tiwari B, *et al.* Prevalence of pulmonary tuberculosis amongst the tribal population of Madhya Pradesh, central India. *Int J Epidemiol* 2009;38:1026-32.
7. van der Werf MJ, Enarson DA, Borgdorff MW. How to identify tuberculosis cases in a prevalence survey. *Int J Tuberc Lung Dis* 2008;12:1255-60.
8. Jain SK, Ordonez A, Kinikar A, Gupte N, Thakar M, Mave V, *et al.* Pediatric tuberculosis in young children in India: A prospective study. *Biomed Res Int* 2013;2013:783698.
9. Rao VG, Gopi PG, Bhat J. Pulmonary tuberculosis: A public health problem amongst the Saharia, a primitive tribe of Madhya Pradesh, Central India. *Int J Infect Dis* 2010;14:e713-6.
10. Azman AS, Golub JE, Dowdy DW. How much is tuberculosis screening worth? Estimating the value of active case finding for tuberculosis in South Africa, China, and India. *BMC Med* 2014;12:216.
11. Thomas BE, Adinarayanan S, Manogaran C, Swaminathan S. Pulmonary tuberculosis among tribals in India: A systematic review and meta-analysis. *Indian J Med Res* 2015;141:614-23.
12. Chakraborty AK. Epidemiology of tuberculosis: Current status in India. *Indian J Med Res* 2004;120:248-76.

How to cite this article: Kumar S, Kumar S, Kumar P, Sayal P, Garg S, Sandhu R. Occurrence of Tuberculosis in Patients Attending a Tertiary Care Hospital in Khanpur, Sonapat, Haryana. A Retrospective Study. *Int J Sci Stud* 2016;4(4):129-132.

Source of Support: Nil, **Conflict of Interest:** None declared.