ORIGINAL ARTICLE

Gender Distribution of Smear Positive Tuberculosis Cases at a Tertiary Care Chest Diseases Centre in Karachi

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ABSTRACT

Objective: To determine the gender differences in smear positive subjects off Tuberculosis presenting to a tertiary care chest disease hospital from urban population of Sindh province.
Methods: Laboratory records of Provincial Reference Laboratory at Ojha Institute of Chest Diseases were retrospectively examined for the year 2013. Z-test for proportions was performed using Social Science Statistics© Calculator, while Odds ratio and Relative risk were calculated using online calculator available at Vassar Statistics©.
Results: A total of 3006 suspects were screened over the period of twelve months in 2013 including 1766 males (58.75%) and 1240 females (41.25%). Of these, 452 males (25.59%) and 381 females (30.72%) were tested positives. There was a statistically significant (p-value = 0.01174) difference in the proportion of test positives among males and females. Male suspects outnumbered females by 1.42:1, however amongst the confirmed TB cases, this ratio reduced to 1.18:1. Odds ratio (OR) for smear positivity amongst males was 0.77, (95% CI 0.66-0.91) with a significantly lower odds (p-value <0.01) among males compared with females.
Conclusions: The proportion of smear positivity in females exceeded that of males despite the fact that fewer females were screened for tuberculosis as compared to males. This may be suggestive of that we are only looking at the tip of the iceberg and a large number of undetected cases is present in females. This observation highlights the significance of prompt identification of active cases among the female population in Karachi. It is therefore suggested that efforts must be directed to active case finding in female population in the Karachi. It is important that efforts must be directed to active case finding in female population in the Karachi population.

Key words: Tuberculosis, Karachi, Smear positivity, Gender

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INTRODUCTION

Tuberculosis is a slowly progressive, debilitating disease that kills more than 1.5 million people world-wide. It is internationally reported that more males as compared to females are screened and diagnosed with tuberculosis in developing as well as developed world and a male-female ratio (MFR) of 1.96 + 0.6 has been reported around the globe. This gender discrepancy is so pronounced that male gender was reported as risk factor for tuberculosis by some studies.

A number of biological, social, cultural and economic factors are implicated for this gender bias, among which socio-cultural factors have been reported to play central role in the delays in diagnosis and treatment of tuberculosis in the female population. In different countries, a number of factors causing delay in diagnosis and treatment of female patients have been identified, which include cultural restrictions to the access of health care, health belief systems, treatment from non-professional health care providers, fear of stigmatization and self-medication. Some reports also show that occasionally doctors can also be responsible for the delay in diagnosis as they tend to ignore the symptoms in females, which contributes to late diagnosis and treatment in this population. It was also reported that female patients of child-bearing age are less likely to seek early medical attention, despite the evidence that the disease is reported to progress more rapidly in these patients. Some research indicates that biological factors may also act as contributors to gender discrepancy in

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tuberculosis due to differences in hormonal and physiological profiles between the two sexes. The possibility that differential MFR might not be due to health inequalities only cannot be overlooked. To study the different trends in diagnosis of tuberculosis, laboratory records of Provincial Tuberculosis Reference Laboratory at Ojha Institute of Chest diseases were retrospectively examined and analyzed for the year 2013.

MATERIALS & METHODS

Data for all incidental cases from the laboratory records of Provincial Tuberculosis Reference Laboratory at Ojha Institute of Chest Diseases, Dow University of Health Sciences, Karachi were retrospectively studied for the year 2013. Data were collected without patients' particulars and were de-identified. Institutional approval was obtained to analyze the data.

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008.

Data were analyzed using online statistical calculators. Z-test for proportions was performed using Social Science Statistics Calculator, while Odds ratio and Relative risk were calculated using calculator available on Vassar Statistics.

RESULTS

A total of 3006 suspects were screened over the period of twelve months in 2013 including 1766 males (58.75%) and 1240 females (41.25%), out of which 452 males (25.59%) and 381 females (30.72%) were tested positive (Table I).

Table 1: Gender based smear results in patients screened for Tuberculosis in 2013

	Males		Females	
	Frequency	Percent	Frequency	Percent
Positive	452	25.59	381	30.73
Negative	1314	74.41	859	69.27
Total	1766	100	1240	100

Male suspects outnumbered females by 1.42:1, however amongst the confirmed TB cases, the ratio was 1.18:1. Odds ratio (OR) for smear positivity amongst males and females was 0.7756, (95% CI 0.6601-0.9112). Risk ratio was calculated to be 0.833 (95% CI 0.-7422-0.9349). Fisher Exact test showed a p value of .0022

DISCUSSION

Analysis of one year records indicated that more males sought medical care as compared to the females, though smear positivity was significantly higher in female patients. This signifies that a large number of diseased female population is being overlooked and disease prevalence may be higher than it appears to be. The higher number of males being screened and diagnosed as TB patients may be considered an indication of higher prevalence in the male population but significantly higher ratio of smear positivity in female population shows that there is a possibility that more females are suffering from the disease than it appears to be, which is also in contrast to most of the reported findings from across the world where more males are diagnosed and treated for tuberculosis, which leads to a higher smear positivity and higher diagnostic ratio among male population.

Our results also show that odds of smear positivity in females are more as compared to males and females were at higher risk of being smear positive. These findings are in contrast to the observed international trends of male predominance in tuberculosis diagnosis and matches European epidemiological profile in early-middle era of the previous century. Studies published from Pakistan show an equal MFR in 2008, however a higher female case notification was observed in females younger than 45 years of age. Another analysis reports MFR in Sindh is on the higher side in the country as compared to other provinces. However, the comparison of patients screened and tested positive has not been reported in both of these studies. Our results match the epidemiological profile of some African countries such as Malawi, where although absolute incidence in male patients was reported to be high, females showed greater sputum positivity. These findings highlight the importance of investigation of the exact reasons of lesser number of females seeking medical help so that the issues can be addressed properly as delays in health-care seeking behavior in Pakistani females have already been documented. Allocation of resources towards active case finding in families affected with tuberculosis would help in detection of latent cases in the community. Efforts must also be directed towards health education and advocacy in the female population so that the time taken to seek medical help can be reduced and spread of the disease can be stopped. The disease can be easily transmitted from mother to children due to a natural intimate contact. Educating and training lady health workers specifically for tuberculosis can provide additional support in diagnosis and treatment of tuberculosis.

REFERENCES

1. Organization WH. Global tuberculosis report 2013. World Health Organization; 2013.
2. Neyrolles O, Quintana-Murci L. Sexual inequality in tuberculosis. PLoS medicine. 2009;6(12):e1000199.
3. Lienhardt C, Glaziou P, Uplekar M, La K. Global tuberculosis control: Lessons learnt and future prospects. Nature Reviews Microbiology. 2005;10(6):407-16.
4. Lienhardt C, Fielding K, Sillah JS, Bah B, Gustafson P, Warndorff D, et al. Investigation of the risk factors for tuberculosis: a case control study in three countries in West Africa. Int J Epidemiol. 2005;34(4):914-23.
5. Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. The lancet. 2013;380(9859):2224-60.
6. Boeree MJ, Harries AD, Godschalk P, Demast Q, Upindi B, Mwale A, et al. Gender differences in relation to sputum submission and smear-positive pulmonary tuberculosis in Malawi [Notes from the Field]. Int J Tuberc Lung Dis. 2000;4(9):882-4.
7. Austin JF, Dick JM, Zwarenstein M. Gender disparity amongst TB suspects and new TB patients according to data recorded at the South African Institute of Medical Research laboratory for the Western Cape Region of South Africa. Int J Tuberc Lung Dis. 2004;8(4):435-9.
8. Long NH, Johansson E, Lonnroth K, Eriksson B, Winkvist A, Diwan VK. Longer delays in tuberculosis diagnosis among women in Vietnam. Int J Tuberc Lung Dis. 1999;3(5):388-93.
9. Nhamoyebonde S, Leslie A. Biological Differences Between the Sexes and Susceptibility to Tuberculosis. J Infect Dis. 2014;209(suppl 3):S100-S6.
10. Borgdorff MW, Nagelkerke NJD, Dye C, Nunn P. Gender and tuberculosis: a comparison of prevalence surveys with notification data to explore sex differences in case detection. Int J Tuberc Lung Dis. 2000;4(2):123-32.
11. Stangroom J. Social Sciences Statistics. 2014 [updated 2014; cited 2014 31st July 2014]; Available from: http://www.socscistatistics.com.
12. Lowry R. Vassar Statistics. 2014 [updated 2014; cited 2014 31st July 2014]; Available from: http://vassarstats.net
13. Thorson A, Diwan VK. Gender inequalities in tuberculosis: Aspects of infection, notification rates, and compliance. Curr Opin Pulm Med. 2001;7(3):165-9.
14. Holmes CB, Hausler H, Nunn P. A review of sex differences in the epidemiology of tuberculosis. Int J Tuberc Lung Dis. 1998;2(2):96-104.
15. Codlin AJ, Khowaja S, Chen Z, Rahbar MH, Qadeer E, Ara I, et al. Gender differences in tuberculosis notification in Pakistan. The American journal of tropical medicine and hygiene. 2011;85(3):514-7.
16. Dogar OF, Shah SK, Chughtai AA, Qadeer E. Gender disparity in tuberculosis cases in eastern and western provinces of Pakistan. BMC infectious diseases. 2012;12(1):244.
17. Qureshi SA, Morkve O, Mustafa T. Patient and health system delays: health-care seeking behaviour among pulmonary tuberculosis patients in Pakistan. JPMA J Pak Med Assoc. 2008;58(6):318.