

PRESENTATION STAGE IN SMEAR POSITIVE PATIENTS OF TUBERCULOSIS IN KARACHI, PAKISTAN: A GENDER BASED COMPARISON

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ABSTRACT

Background and Aim: Stage of disease at the time of presentation is an important aspect of community based intervention of Tuberculosis. This study was carried out to investigate the association between disease stage at presentation and gender of the patient at the time of diagnosis in smear positive patients of pulmonary tuberculosis.

Materials and Methods: A cross sectional study of the record of Tuberculosis Laboratory at Dow University of Health Sciences, Pakistan, was performed, comprising of culture confirmed 1201 true-positive patients. Patients were classified as early or late presenters on the basis of sputum smear bacterial load.

Results: The positivity rates among both the genders were comparable. Chi-square test showed no significant difference (X^2 0.8, $df=1$, $p=0.368$). Approximately two-thirds of patients were late presenters. Age-wise stratification showed statistically significant difference among different age groups in females (X^2 6.4, $df=2$, $p=0.04$).

Conclusion: Though affects every aspect of TB, we found that in our setting the stage of disease at presentation is not related to gender and both groups generally present at the same stage across different age groups. However, there is a high proportion of later presenters, and an early detection might considerably decrease spread of disease.

Key Words: Gender; Tuberculosis; Microscopy; Stage of Presentation

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INTRODUCTION

One of the regions bearing the highest burden of Tuberculosis (TB) is South-East Asia, which carries most of the global TB burden.¹ Despite being an infectious disease, a number of demographic and socioeconomic factors affect spread of TB, which includes poverty level, crowding and various genetic and immunologic factors.²

Among the genetic factors, gender is considered an important predictor of the disease dynamics as many gender based differences in TB epidemiology are being described.³⁻⁵ In the South Asian region, the case notification rates have been reported double in males as compared to females (2:1 Male to female ratio),

which matches the global figures, where the reported ratio of males to females (MFR) have been reported to be 1.96 ± 0.6 . Some studies have reported that this difference is so pronounced that male gender is at risk factor.⁶ Gender discrepancy are implicated to a number of genetic, biochemical, cultural and socioeconomic factors, including delay in diagnoses, ignorance of symptoms, decreased education and awareness among the female population^{7,8}. Different countries have reported different factors for this gender based difference, which include socio-cultural restrictions to the access of facilities, health related beliefs, treatment from quacks, stigmatization and self-medication. Some studies have suggested that physicians can also be responsible for some delay as they tend to ignore TB symptoms in women, while

other have found evidence that that biological factors are more important contributors to gender discrepancy and males are affected more due to differences in hormonal and physiological profiles.^{5,6} However, the possibility that difference in MFR might be due to health inequalities only cannot be overlooked.

The trend in Pakistan is a bit different and disease in females have been reported to be higher as compared to males. In Khyber-Pukhtunkhwa and Balochistan were higher in females, while males were more notified to have disease in Punjab and Sindh,⁹ while another study reported to be a higher ratio of diagnosis in females as compared to males in Paksitan.¹⁰ In our previous report, we had identified that the ratio of smear positivity was significantly higher in females population in the screened individuals.¹¹ Another of our studies, showed that the ratio of false negativity is significantly higher in females when sputum smear microscopy was confirmed against TB culture.¹²

It is not however, clear that whether this difference also results in delay in diagnosis and the stage of disease at the time of presentation. To investigate the difference of disease stage at the time of presentation between the two genders, microscopic grading of the submitted sputum was examined retrospectively to see if there are similar gender based differences in the submitted samples between males and females

MATERIALS AND METHODS

A cross sectional study of the record of Tuberculosis Laboratory, Ojha Institute of Chest Diseases(OICD) during January 2011 to December 2014 comprising of culture confirmed 1201 true-positive patients was performed to study the gender-wise stage at presentation at the time of diagnosis of pulmonary TB. Patients were diagnosed as early presenters (Scanty on the basis of presence of 1-9 bacilli in 100 fields-1+ on the basis of 10-99 bacilli in 100 fields) and late presenters (2+ on the basis of 1-10 bacilli per field, 3+when>10 bacilli per field) based on bacterial load detected on microscopy as per international guidelines.¹³ Only culture confirmed true-positive diagnostic patients were included and those coming for follow-ups or not-confirmed by culture were excluded from the study. Data were tabulated using Microsoft Excel¹⁴ and Statistical analysis was performed using Open Epi ® calculator.¹⁵ Institutional approval was taken for the study. All data were de-identified before tabulation.

RESULTS

A total of 1211 patients were detected smear positive during the four-year period. Among these 587(48.8%) were males while 614 (51.1%) were females. A Chi-square test showed no significant difference among males and females (X²0.81, d f= 1, p=0.37), though in

Table 1. Gender based comparison of smear results in patients screened for Tuberculosis

	Early Presenters	Late Presenters	Total	X ²	df	p-value
Males	32.5191 (%)	67.5396 (%)	587%	0.81	1	0.37
Females	30.1185 (%)	69.9429 (%)	614 %			
Total	376	825(%)	1201%			

Table 2. Comparison of Smear results of Female patients stratified for age

Age	Early Presenters	Late Presenters	Total	X ²	Df	p-value
<18	35.445 (%)	64.582 (%)	127 (%)	6.4	2	0.04
19 -45	26.7105 (%)	73.3287 (%)	392 (%)			
>45	39.127 (%)	60.942 (%)	69 (%)			
Total	177	411	588			

Table 3. Comparison of Smear results of Male patients stratified for age

Age	Early Presenters	Late Presenters	Total	χ^2	Df	p-value
<18	28.315 %	71.738 %	53 %	0.98	2	0.61
19-45	30.9119%	265 %	69.1 384%			
>45	34.845 (%)	65.284 %	129 %			
	179	387	566			

both the genders, approximately two-thirds of the patients were found to be late presenters (Table 1).

On Age-wise stratification among the two groups, excluding patients with missing age, chi-square test showed that there was statistically significant difference in different age groups in females, who were found smear positive at the time of presentation ($\chi^2=26.4$, d f = 2, p=0.04). It was observed that most of the diagnosed cases belonged to 19-45 age group (Table 2). This difference was not statistically significant in males ($\chi^2=20.97$, d f = 2, p=0.61), however the most populated group was still the late-presenting, young-middle aged males (Table 3).

DISCUSSION

Analysis of the diagnostic smear positive specimen from 1201 specimens showed that men and women were equally being diagnosed as tuberculosis patients in our setting. This complements to our previous reports, where we have observed that more males turn up for accessing TB services, however the ratio of false-negativity) as well as positive diagnosis is higher in females.^{11,12} The data are somewhat consistent with previous nationally published report, though it shows a slightly different scenario from the same report about Sindh, as males were reported to have a higher case notification as compared to females.⁹ Though this contrasts with the wider world where TB is considered to have a male predominance, and more males are diagnosed with TB than females.¹⁶ This difference is attributed to a number of cultural and biological factors including living habits, hormonal profiles, immunity and access to medical care.^{17,18} Similarity in both genders in our results can be explained by the fact that our laboratory, mainly receives diagnostic specimens from the urban settings, where women are comparatively more aware of health related issues and do seek medical advice when it is necessary.

However, our data show that more of the patients came at a delayed stage for diagnosis, which signifies that if awareness campaigns can be run to improve health literacy, the disease can be detected at an earlier stage and transmission can be blocked. It is therefore important that resources should be allocated for active case finding in the community.

It was also observed that majority of the diagnosed patients belonged to the middle age group, and were late presenters, which is another important finding as efforts to stop transmission at an early stage must be directed towards this particular population. Moreover, low grade positivity, should also be treated with caution¹⁹ as there is a possibility of missing a diagnosis and falsely labeling the patient as negative, especially when the smear results are scanty. Introduction of fluorescent microscopy at different high-burden centers in the country is a laudable effort and would likely help to deal with this problem.

CONCLUSION

Though affects every aspect of TB, we found that in our setting the stage of disease at presentation is not related to gender and both groups generally present at the same stage across different age groups. However, there is a high proportion of later presenters, and an early detection might considerably decrease spread of disease.

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