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Tuberculosis and gender parity in a TB Referral Centre, South –South Nigeria

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Research Article

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ABSTRACT

Background: Epidemiological information shows that there are differences between men and women in prevalence of TB infection, rate of progression from infection to disease, HIV and TB co-infection rate, and mortality due to pulmonary tuberculosis.
Study of gender differences in prevalence and treatment outcome of patients will assist in targeting those at higher risk and ensure successful TB control planning.
Aim: This study is aimed at determining gender differences in the prevalence of clinical disease, HIV and TB co-infection rate and treatment outcome amongst TB patients that attended this referral hospital between January 2003 to December 2012.
Methodology: A retrospective survey was carried out on the records of all Acid Fast Bacilli (AFB) smear positive Pulmonary Tuberculosis patients who attended this hospital during the period under review. Epidemiological information was collected retrospectively from the tuberculosis laboratory and treatment registers to explore gender disparity in the prevalence of clinical disease, HIV and TB co-infection rate and treatment outcome among the TB patients.
Results: A total number of 1612 HIV negative male TB patients attended the DOTS centre of this hospital as against 1013 females during the study period. Male had a higher prevalence ,the male: female ratio was 1.59. There were a total number of 156 HIV - TB co-infected female subjects constituting 9.7% of the female TB patients while 106 males were HIV-TB co-infected constituting 4.7% of the male patients. The difference was statistically significantly (P<0.00).
Conclusion: Our findings bring into sharp focus the gender disparity in the TB prevalence and HIV-TB co-infection among the study subjects. TB control programme should routinely review and monitor programme reports and take appropriate measures to improve the current TB control policies and programme.

Keywords: Pulmonary Tuberculosis, Prevalence, Gender Disparity.

INTRODUCTION

Tuberculosis (TB) is one of the leading infectious diseases worldwide especially in low and middle income countries. In 2011, there were an estimated 8.7 million new cases of TB and 1.4 million deaths attributable to the disease amongst which almost one million deaths occurred in HIV-negative individuals and 430 000 in people who were HIV-positive.

TB is one of the top killers of women, with 300 000 deaths among HIV-negative women and 200 000 deaths among HIV-positive women in 2011. Epidemiological evidence shows that there are differences between men and women in prevalence of TB infection, rate of progression from infection to disease, incidence of clinical disease, and mortality due to tuberculosis (Holmes et al.,1998). However there are conflicting reports of the differences and the implications are not well understood. Some reports suggest men are more at risk of developing TB than women while others reports otherwise.

Case-notification rates from countries with a high prevalence of tuberculosis suggest that tuberculosis may be less frequent among females. Globally, the ratio of male to female tuberculosis cases is 1·5–2·1. Higher tuberculosis notification rates in men may partly reflect epidemiological differences, exposure to risk of infection and progression from infection to disease (Howson et al.,1996) .

An understanding of the factors that impact on case detection and cure rates including the influence of gender may provide useful information on the determinants of differences in prevalence and treatment outcome of patients will assist in targeting those at higher risk and ensure successful TB control planning.

Directly Observed Therapy Short Course (DOTS) was introduced in the Tuberculosis and Leprosy Referral Hospital, Igbogene-Yenagoa, South–South Nigeria in 2003 and it serves an estimated population of 1,704,515 ((Bayelsa State population estimates, 2010).

We undertook a review of all patients with TB and treatment outcomes in a ten year period between January 2003 and December 2012 to determine the relation between gender and prevalence of clinical disease, HIV and TB co-infection rates and treatment outcomes

METHODOLOGY

Patients and Methods

Study Design

A retrospective survey of patients with pulmonary tuberculosis in the Tuberculosis and Leprosy Referral Hospital's (DOTS) Centre Igbogene, Nigeria over a 10-year period (January 2003 and December2012).

Setting:

The tuberculosis and leprosy DOTS centre, Igbogene, serves as a referral hospital to tuberculosis patients resident in Bayelsa, Rivers and Delta states of Nigeria. Most of the served communities are surrounded by water and inaccessible by road.

Study Participants

All sputum smear-positive TB patients who were treated between January 2003 and December 2012 at the TB and Leprosy Referral Hospital Igbogene, Bayelsa State. Patients under 5 years were excluded as very few smear-positive cases are found at these ages.

Data Collection

A standard questionnaire was used to obtain clinical details from TB laboratory and treatments registers. Details collected included information on demographic data, date of commencement of treatment, category of patients, category of treatment, pretreatment smear result, treatment outcome and HIV status.

Data Analysis

Data were analyzed with Statistical Package for Social Sciences version 15.0 (SPSS) software. Frequency tables, ratio, proportions and rates were used to review data.

The chi-square test was used to determine the statistical significance of association between categorical variables.

The population of Bayelsa state is about 1,704,515 with a male population of 887,450 constituting 52.1% as against 817,065 of females making up 47.9% of the population, with a male to female ratio of 1.09 (2010 Bayelsa State population estimates).

In order to allow comparison by age and sex the patients were re-grouped into the following age groups: 5-14, 15– 24, 25–34, 35–44, 45–54, 55–64, 65 years and above. The resulting rate ratios were used as a measure for age-specific gender-related differences.

RESULTS

Out of a total of 2625 HIV negative TB patient, 1612 (61.4%) were males while 1013 (38.6%) were females with a male to female ratio of 1.59.

Males had higher prevalence of HIV negative TB patients in each year of study than females. A total number of 1612 HIV negative male TB patients attended the DOTS centre of this hospital as against 1013 females during the study period. The average Male Female ratio during the period under study was 1.59 (Table 1)

Table 1: Yearly distribution of HIV negative TB patients based on gender

Year	No. of Males (%)	No. of Females (%)	M/F Ratio	Total
2003	121(52.6)	109(47.4)	1.11	230
2004	167(60.1)	111(39.9)	1.50	278
2005	174(58.6)	123(41.4)	1.41	297
2006	258(68.6)	118(31.4)	2.19	376
2007	115(60.8)	74(39.2)	1.55	189
2008	104(66.2)	53(33.8)	1.96	157
2009	102(55..4)	82(44.6)	1.24	184
2010	160(59.7)	108(40.3)	1.48	268
2011	214(63.3)	124(36.7)	1.72	338
2012	197(64)	111(36)	1.77	308
Total	1612(61.4)	1013(38.6)	1.59	2625

DISCUSSION

In this study, we found that there is a gender disparity in the prevalence of TB amongst the patients that attended this hospital during the study period. The difference between the men and women prevalence appears to be larger in the agegroup55-64 years and lower in the age groups 15-24 and 25-34 years.

A striking feature of TB, which is apparent in prevalence surveys from most parts of the world (Cassels et al.,1982; Paolisso et al.,1995 ; Bruchfeld et al. 2002) is that TB is commoner in men than women. Studies show that sex differences in prevalence begin to appear between ages 10 to 16 and remain higher for males than females. Thus, gender is an important aspect of TB epidemiology.

Our finding is similar to the studies of Bruchfeld et al. (2002), Mota et al. (2006), Akpaka et al. (2006) and Okonko et al. (2012) who reported that TB infection was more in males than females. Obiora et al. (2004) also reported higher infection rate for TB among males in Benin and Irrua, Nigeria. Nnorom et al. (1996) reported higher infection rate for TB among males in urban and rural communities in Nigeria.

The reason for this difference in prevalence between the sexes is not known from our study.

It seems probable that a combination of different factors such as biological differences in disease and disease presentation, together with gender related factors like access to health care may play a role. There are biological and immunological evidence which suggest that men may have more infectious TB (smear-positive pulmonary TB) than women ((Diwan et al,, 1999).

A theory that is often presented as an explanation to the sex differences is that men in general have a wider social network that leads to a greater exposure to the agent, Mycobacteria which causes TB. A population study (Thorson et al., 2000) among people with a cough for more than 3 weeks reported that although women did not start seeking health care later than men, they often sought health care from less qualified providers, took more health care actions, and had longer delay to hospital than men. In a study on TB patients by Matsushita et al., 1996, in Japan, they observed that the stage and the extent of lung lesions are less advanced among female than among male TB patients. So the prevalence of cough and sputum expectoration among female TB patients was significantly less common than among male patients.

In many low-income countries, women often have a lower social position and poorer access to economic resources, education, and information than men. These gender differences influence both health risks among women and care-seeking behavior (Paolisso et al.,1995).

However, the gender disparity in TB prevalence is lower in the female reproductive age groups (Table 2). Pregnancy has been thought to increase the risk of reactivation of latent infections (Brabin ,1985). In order to explain the reasons for the gender differences in the TB prevalence, further studies are needed to have a better understanding of TB epidemiology in our setting.

Table 2: Sex and Age distribution of the patients

Age group in years	No. of Males	No. of Females	M/F Ratio	Total in 10 years
5-14	67	44	1.52	111 (4.2)
15-24	280	259	1.08	539 (20.5)
25-34	590	410	1.44	1000 (38.1)
35-44	266	167	1.59	433 (16.5)
45-54	191	124	1.54	315 (12)
55-64	97	60	1.62	157 (6.0)
≥65	36	24	1.5	70 (2.7)
Total	1612	1013	1.59	2625 (100)

There is no significance gender difference in the DOTS treatment outcome of the patients during the study period (Table 3).

Table 3: Gender differences in TB treatment outcome of the subjects

Variables	No. of Males (%)	No. of Females (%)	Pearson's Chi-square	Odds Ratio	P-value
Treatment Success	1086(73)	688 (71.5)	0.085	1.025	0.771
Treatment Failure Default	38(1.6)	22 (1.9)	0.096	1.088	0.757
Died	446 (23.6)	276 (24.5)	0.055	1.021	0.81
Transferred Out	40 (1.7)	24 (2.1)	0.033	1.049	0.86
Total	2(0.1)	3(0.1)	0.993	2.415	0.319
	1612(100)	1013(100)	-	-	-

Our study showed a difference in TB and HIV co-infection rate between male and female subjects. More females, 156 compared to 106 of males were co-infected with TB and HIV. The TB and HIV co-infection rate among the females was 9.7% contrasted to 4.7% of the male subjects and the difference was statistically significant (P<0.000) (Table 4).

Table 4: Gender differences in HIV and TB co-infection among the subjects

HIV Status	Male (%)	Female (%)	Pearson's Chi-square	Odds Ratio	P-value
Positive	106(4.7)	156(9.7)	43.4	2.342	0.000(s)
Negative	1612(95.3)	1013(90.3)			
Total	1718(100)	1169(100)			

This observation is in line with the findings of a study by a group of researchers in Lagos Nigeria (Onubogu et al.,2010). This is in contrast with the studies of Taura et al. (2008) in Kano State Nigeria and Nwachukwu et al. (2009) in Abia State, Nigeria. The differences in the infection rate in females and males could be as a result of biological factors such as higher susceptibility to infection due to low immunity in women.

In our study there was no statistically significant difference in the TB treatment outcome between the two groups.

LIMITATIONS

Our study is has some limitations. The analysis was restricted to smear-positive tuberculosis cases and did not assess possible gender inequities in access to care for smear negative or extra-pulmonary TB. In addition, being a retrospective study, some details may have been omitted in the records which may potentially bias the study.

CONCLUSION

In conclusion, our study shows that there are gender differences in the TB prevalence and HIV-TB co infection rates among the study subjects however the treatment outcomes are similar for men and women.

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