**Short Communication**

**Prevalence of pulmonary tuberculosis among patient attending some selected hospitals at Maiduguri Metropolis, Borno State, Nigeria**

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Accepted 16 December 2014

**ABSTRACT**

Tuberculosis has been declared a global emergency by the World Health Organization (WHO) and is the most important communicable disease worldwide. Therefore, this study was aimed to determine prevalence of Pulmonary Tuberculosis among patients attending some selected hospitals, Maiduguri Metropolis, Nigeria. Out of three thousand two hundred and seventy two (3272) patients whom attended some selected hospitals (University of Maiduguri Teaching Hospital (UMTH) and Chest Disease Screened Centre (CDSC)) at Maiduguri Metropolis were screened for pulmonary tuberculosis, 2676 (81.8%) were positive. Therefore, more pragmatic effort has to be put in place to alleviate poverty and social exclusion in the study area.

**Keywords:** Pulmonary, Tuberculosis, UMTH, CDSC and Prevalence

**INTRODUCTION**

Tuberculosis has been declared a global emergency by the World Health Organization (WHO) and is one of the most important communicable diseases worldwide. Approximately one third of the world population is infected and about three million die each year from this disease (WHO, 2002). It remains the principal cause of death in the developing countries (Suri and Gupta, 1999) probably due to poverty, lack of education, low detection rate, non-availability of experienced staff and insufficient coverage of the community by immunization programme. The incidence of tuberculosis is again on the rise in developed countries, due to the influx of immigrants from third world countries, HIV infection and increasing use of Immuno-suppressive therapy. Pulmonary tuberculosis is a disease condition caused by a bacterium species called Mycobacterium tuberculosis. This bacterial pathogen (M. tuberculosis) was discovered and identified by Robert Koch in 1882 (Parish and Stoker, 1999). Cox (2004) described it as a small rod-like bacillus that can withstand weak disinfectants and survive in a dry state and can grow only within the cells of a host organism. These attributes of Mycobacterium tuberculosis made Robert Koch to describe and establish that pulmonary tuberculosis is an infectious disease. When viewed using the microscope, M. tuberculosis would appear red in colour presenting rod-like shape, usually bacilli in chains. The most common form of disease, caused by Mycobacterium tuberculosis, is pulmonary tuberculosis. Within the lungs, the bacterium is taken up and if not contained by the immune system, is able to grow uncontrollably, resulting in the subsequent development of tuberculosis disease. The bacterium is propelled into the environment when a person with pulmonary disease coughs speaks or sings and aerosolized droplets can
then be inhaled by those who are in close contact with the infectious case (Menzies and Khan, 2007). Efforts to decrease the rates of tuberculosis must focus on controlling transmission as a means to reduce the overall burden of the disease. It has been observed that not all patients who have pulmonary tuberculosis transmit the disease, and thus in understanding tuberculosis transmission, research must include an examination of specific transmission events to highlight the factors that influence and result in transmission with or without the generation of secondary cases.

In 2005, the country with the highest estimated incidence of pulmonary tuberculosis is Swaziland with 1262 case per 100,000 people. The highest number of infection occurs in India with over 1.8 million cases (WHO, 2007). In developed countries, pulmonary tuberculosis is less common and mainly an urban disease. In the United Kingdom, pulmonary tuberculosis incidence ranges from 40 per 100,000 in London to less than 5 per 100,000 in the Rural South West of England with a National average of 13 per 100,000 (Nahid et al, 2006). The highest rates in Western Europe are in Portugal (42 per 100,000) and Spain (20 per 100,000), 113 per 100,000 in China and 64 per 100,000 in Brazil. In the United States, the overall pulmonary tuberculosis case rate was 4.9 per 100,000 persons in 2004 (CDC, 2005). The age at which a person becomes infected with pulmonary tuberculosis is the main factor that determines the outcome. The incidence of pulmonary tuberculosis varies with age. In Africa, pulmonary tuberculosis primarily affects adolescents and young adults especially men (WHO, 2006). Among men of between the ages of 25 and 30 who are infected, fewer than 11% present symptoms of this disease, whereas those between the ages of 30 and 35 who are infected, has about 50% presenting symptoms of pulmonary tuberculosis. For those between the ages of 35 and 40 years who are infected, symptoms are presented in 80-90% of them. However, in countries where pulmonary tuberculosis has gone from high to low incidence such as United States, pulmonary tuberculosis is mainly a disease of the older people (CDC, 2005). Therefore, this study was aimed to determine prevalence of Pulmonary Tuberculosis among patients attending some selected hospitals in Maiduguri metropolis, Nigeria.

MATERIALS AND METHODS

Study area

This study was simultaneously conducted in two hospitals, University of Maiduguri Teaching Hospital (UMTH) and Chest Disease Screened Centre (CDSC) both within Maiduguri metropolis, Borno State, December 2010 to January 2012. A total of three thousand two hundred and seventy two (3, 272) patients whom attended the hospitals within the period of the study were considered. The definition of bacteriologically confirmed pulmonary tuberculosis is based on two consecutive, spontaneously produced sputum specimens positive for AFB, using a Ziehl-Neelsen technique.

Collection of samples

The study population consists of all patients who present symptoms of the TB, but with no history of prior treatment against TB visited the two hospitals between January 2010 and December 2012 were considered for the determination of prevalence rate of the tuberculosis.

Laboratory procedures

The screw-cap containers were given to the patients to cough into. Collection of samples was done in a secluded and open air area. All collections were done in the morning and immediately screened. Smears were stained by using the Ziehl- Nielsen technique with carbol fuchsin and methylene blue. The smears were scored by 1 reader according to the guidelines of the International Union Against Tuberculosis and Lung Disease (Enarson et al., 2000). A smear result was considered positive if we observed >1 acid-fast bacillus per 100 oil-immersion fields. This provision included scanty smears because these are considered indicative of true positivity.

Statistical analysis

The data obtained in the study was subjected to statistical analysis using Chi-square and independent t-test were used to determine the difference between the variables with the level of significance set at p< 0.05 using statistical package (R version 2.13.1).

RESULTS

A total of three thousand two hundred and seventy two (3272) patients whom attended some selected hospitals (UMTH and CDSC) at Maiduguri Metropolis were screened for pulmonary tuberculosis between January 2010 and December 2012. Higher prevalence of 86.8% was recorded in 2012, followed by 2011 (82.8%) and 2010 (74.0%), although no statistically significant difference was observed as P>0.05 (Table 1).

The distribution of pulmonary tuberculosis based on years showed that higher prevalence was recorded among patients attending CDSC 87.7% than UMTH with 63.6% with highly statistical significant difference (t = 3.3281, df = 5, p-value = 0.02082). Also higher prevalence was obtained in 2012 in both of the hospitals.
Table 1. Distribution of Pulmonary Tuberculosis among patients attending some selected Hospitals in Maiduguri Metropolis

<table>
<thead>
<tr>
<th>YEARS</th>
<th>TOTAL</th>
<th>POSITIVE</th>
<th>POSITIVE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>922</td>
<td>684</td>
<td>74.0</td>
</tr>
<tr>
<td>2011</td>
<td>1225</td>
<td>1015</td>
<td>82.8</td>
</tr>
<tr>
<td>2012</td>
<td>1125</td>
<td>977</td>
<td>86.8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3272</td>
<td>2676</td>
<td>81.8</td>
</tr>
</tbody>
</table>

(X-squared = 56.0096, df = 2, p-value = 6.881e-13)

Table 2. Distribution of Tuberculosis among patients attending UMTH and CDSC at Maiduguri Metropolis based on years

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Samples</th>
<th>Positive Samples (%)</th>
<th>CDC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UMTH</td>
<td>CDC</td>
<td>UMTH (%)</td>
</tr>
<tr>
<td>2010</td>
<td>321</td>
<td>601</td>
<td>197</td>
</tr>
<tr>
<td>2011</td>
<td>258</td>
<td>967</td>
<td>161</td>
</tr>
<tr>
<td>2012</td>
<td>226</td>
<td>899</td>
<td>154</td>
</tr>
<tr>
<td>Total</td>
<td>805</td>
<td>2467</td>
<td>512</td>
</tr>
</tbody>
</table>

(t = 3.3281, df = 5, p-value = 0.02082)

Table 3. Distribution of Tuberculosis among patients attending UMTH and CDSC at Maiduguri Metropolis based on age

<table>
<thead>
<tr>
<th>Age</th>
<th>Total Samples</th>
<th>Positive Samples (%)</th>
<th>CDC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UMTH</td>
<td>CDC</td>
<td>UMTH (%)</td>
</tr>
<tr>
<td>0 - 20</td>
<td>270</td>
<td>793</td>
<td>180</td>
</tr>
<tr>
<td>21 - 40</td>
<td>255</td>
<td>843</td>
<td>155</td>
</tr>
<tr>
<td>&gt;40</td>
<td>280</td>
<td>831</td>
<td>177</td>
</tr>
<tr>
<td>Total</td>
<td>805</td>
<td>2467</td>
<td>512</td>
</tr>
</tbody>
</table>

(t = 3.6158, df = 5, p-value = 0.01529)

The prevalence of pulmonary tuberculosis based on age showed that patients with 0 – 20 years having a greater prevalence rate of 66.7% in UMTH, followed by >40 years (63.2%) and 21 – 40 years (60.8%). Similarly, high prevalence rate of 88.7% was found among age group >40 years at CDSC, followed by 0 – 20 years (87.4%) and 21–40 years (87.1%), with highly statistical significant difference between the two hospitals (t = 3.6158, df = 5, p-value = 0.01529) (Table 3).

DISCUSSION

Tuberculosis has re-emerged as a devastating disease during the last decade with resulting high morbidity and mortality. The resurgence of pulmonary tuberculosis disease as a serious health problem in many parts of the world, and knowing that this disease is more infectious and easily contacted than the Human Immunodeficiency Virus (Ekrakene and Igeleke, 2010) is a public health concern. Out of three thousand two hundred and seventy two (3272) patients who attended some selected hospitals (UMTH and CDSC) at Maiduguri Metropolis and screened for pulmonary tuberculosis, 2676 (81.8%) were positive. The highest, 86.8% was recorded in 2012 followed by 2011 (82.8%) and 2010 (74.0%), This indicates a rising trend, although no statistically significant difference was observed as P>0.05 (Table 1). The prevalence of tuberculosis seems to decrease in recent years all over the world, (World Health Organization, 2009) which is contrary to result of this study. (2010- 2012). Pulmonary Tuberculosis can affect any age group but is more common in adolescence. The ages of the patients in this study ranged from very young to very old, but majority were > 40 years. The results revealed a high prevalence of pulmonary tuberculosis in all the age groups with 88.7% in age group >40 years, 87.4% in age group 0-20 years, and 87.1% in age group 21-40 years at UMTH while prevalence of 66.7% among the age 0-20 years, 63.2% in age >40 years and 60.8% in age 21-40 years was observed at CDSC. In both hospitals, age group 20-40 years had a relatively lower prevalence compared to other age groups. This finding disagrees with the work of Ritesh et al, (2006) who reported that, there was an increased frequency of pulmonary tuberculosis amongst 125 men with a mean age of 34 years.

CONCLUSION

In this study out of three thousand two hundred and seventy two (3272) patients who attended some selected hospitals (UMTH and CDSC) at Maiduguri Metropolis and screened for pulmonary tuberculosis, 2676
(81.8%) were positive. This study indicates a very high prevalence rate therefore, more pragmatic effort has to be put in place to alleviate poverty and social exclusion in the study area, as well as ensure that other upstream factors (political willingness, politico-economic stability, food security, social infrastructures and energy) are provided.

REFERENCES


