

SPUTUM SMEAR POSITIVITY AMONG PATIENTS PRESENTING TO THE DOTS CLINIC WITH CHRONIC COUGH

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ABSTRACT

Background: Cough is one of the cardinal features of Pulmonary Tuberculosis (PTB). However, even in communities with high prevalence of TB, lung diseases other than TB appear to account for this symptom. **Objective:** To estimate the prevalence of sputum smear positivity among patients with TB who presented with complaints of chronic cough to the Directly Observed Therapy Short Course (DOTS) clinic at the University of Maiduguri Teaching Hospital, North Eastern Nigeria. **Methodology:** A cross sectional study was conducted at the University of Maiduguri Teaching Hospital (UMTH) Borno state, Northeastern Nigeria between September 2014 and January 2017. All patients (new or previously treated) who presented to the DOTS clinic of the UMTH with complaints of chronic cough and had screening for pulmonary TB using sputum smear microscopy were reviewed. Data were entered into a computer database and analyzed with SPSS version 20.0 statistical software. **Results:** The minimum and the maximum ages were 1 year and 85 years, respectively, and the mean age was 36.0 (SD=14.0) years. The mean age did not differ among the male and female patients (i.e. 37.3 ± 14.4 vs 34.1 ± 13.2 , $p=0.78$). The overall prevalence of sputum smear positivity for TB was 26.5%. Although majority of patients who were sputum smear positive for TB fell within the age groups 30-39 and 20-29 thus accounting for 42.6% and 28.7% respectively, however, there was no significant association between age of those with chronic cough and sputum smear positivity TB ($p=0.80$). Among those who were sputum smear positive, 24.3% were new cases and 2.2% were previously treated. **Conclusions:** This study showed a high prevalence of sputum smear positivity among suspected TB patients with complaints of chronic cough. This could be explained by the fact that the DOTS strategy has improved the case detection of PTB in this community. All patients with chronic cough should be evaluated for PTB.

Keywords: Directly observed therapy short course, Prevalence, Sputum smear, Tuberculosis.

INTRODUCTION

Globally, tuberculosis (TB) is one of the leading causes of morbidity and mortality. Around 10.4 million new TB cases were diagnosed out of which about 1.8 million died from the disease in 2015.¹ In line with the Millennium Development Goals (MDG) framework of 2015 global targets, significant progress has been achieved.² However, there has not been significant reduction in mortality and prevalence of TB in the world health organization (WHO) African region. Over 90% of deaths due to TB occurred in the underdeveloped countries of the world.^{1,2} Early TB diagnosis and

treatment saved an estimated 49 million lives between 2000 and 2015.¹ Although the use of Directly Observed Treatment Short Course (DOTS) strategy introduced by the WHO was quite successful in TB treatment, the rate of case detection is still low, and poses a serious challenge in TB control programs particularly in areas with high TB burden.³ Nigeria is one of the six countries that account for 60% of the total TB burden in the world.¹ The national case detection and treatment rate is at 40% and 83%; falling short of the national target of 70% and 85% respectively.⁴

Cough is one of the cardinal features of pulmonary TB (PTB). Even in high prevalent TB areas, other lung conditions may be responsible for chronic cough.⁵ However, active TB should always be considered in any person presenting with complaints of chronic cough due to its contagious nature and potential for high morbidity and mortality.

As part of its efforts to control TB, WHO has designed a practical approach to lung health (PAL) as one of the components of global (DOTS) program. According to the WHO Cough is said to be chronic when it is of 2weeks' duration⁶. To increase detection rate, the strategy recommends that patients with chronic cough who live in areas with high TB prevalence be screened for TB.⁶⁻⁷

The Nigerian government has integrated the diagnosis and treatment of TB in various health institutions across the country. The DOTS strategy is now an integral part of the TB control programme, and its coverage has been extensive. However, detection of cases of new smear positive is far below the WHO target.⁸ Newer strategies like Stop TB 2005 and End TB strategies 2016 have also been adopted in renewed efforts to ensure reduction in incidence, mortality and catastrophic consequences from TB.

In this study, we estimated the prevalence of sputum smear positive TB among those who presented with chronic cough to the DOTS clinic at University of Maiduguri Teaching Hospital (UMTH) Maiduguri.

MATERIALS AND METHOD

A cross sectional study conducted at the UMTH Borno state, Northeastern Nigeria. Data was collected over a period of 28 months, between September 2014 and January 2017.

All patients who presented to the DOTS clinic of the UMTH with complaints of chronic cough were asked to provide three sputum samples for screening for pulmonary TB using smear microscopy in line with the National guidelines. Records of all patients were reviewed.

Data on socio-demographic characteristics (age, gender, marital status, religion, occupation and educational level) and sputum smear results were obtained from the TB register. Pulmonary tuberculosis was diagnosed through standard a procedure, where all patients with cough for two or more weeks are required to submit two sputum samples in the form of spot-morning Ziehl-Neelsen's staining technique was used to determine the presence of acid fast bacilli. Data were entered and analyzed using SPSS version 20.0.

RESULTS

Out of a total of 514 patients who presented with complaints of chronic cough and had sputum smear examination for suspected PTB, 309 (60.1%) were males and 205 (39.9%) females. The minimum and the maximum ages were 1 year and 85 years, respectively, and the overall mean age of the patients was 36.0 (SD=14.0) years. The mean age did not differ among the male and female patients, with a mean age of 37.3 ± 14.4 for males and 34.1 ± 13.2 for females, p=0.78. Majority of the patients were in the age range of 30-39 accounting for about 31.5% while 2.9% were below the age of 9 years.

A total of 136 patients were smear positive with an overall prevalence of smear positive PTB of 26.5%. Although majority of patients who tested positive for TB fall within the age groups 30-39 and 20-29 and accounted for 58 (42.6%) and 39 (28.7%) respectively, no significant association was found between ages of those with chronic cough and sputum smear positive TB (p=0.80). Table 1. The prevalence of smear positivity among new cases was 24.3% and 2.2% among previously treated patients (defaulted treatment: 0.6% and failed treatment: 1.6%). Table 2. Among those patients with positive sputum smear for TB, 49 were Human Immunodeficiency Virus (HIV) positive.

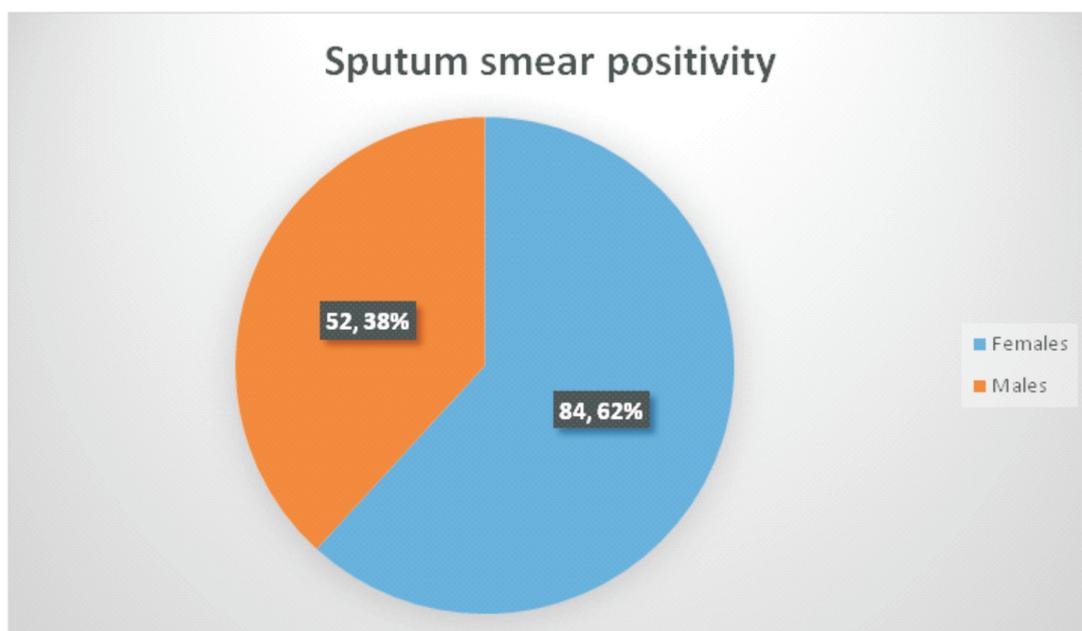
Table 1: Age/TB status Distribution the study population

Age	Frequency of Sputum smear positivity	Percentages (%)
<9	4	2.9
10-19	0	0.0
20-29	39	28.7
30-39	58	42.6
40-49	25	18.4
50-59	3	2.2
60-69	3	2.2
70-79	2	1.5
80-89	2	1.5
Total	136	100.0

Table 2: Distribution of TB status among sputum smear positive cases

TB status	Frequency	Percentage (%)
New cases	125	24.3
Defaulted treatment	3	0.6
Failed treatment	8	1.6
Total	136	26.5

Although majority of the patients positive for TB were males, there was no statistically significant association between gender and TB status ($p=0.97$). Figure 1

**Figure 1:** Pie chart showing sputum smear positivity distribution among the genders

DISCUSSION

This study has demonstrated that the overall prevalence of sputum smear positivity among patients who presented with complaints of chronic cough at the study site was 26.5%. Male patients and persons between the ages of 20 and 39 years had the highest prevalence of sputum smear positivity in our study. Studies have shown that age groups 20-39 years have the highest prevalence of HIV infection among the study population and this could perhaps explain the highest prevalence of sputum smear positivity for TB among this age group in the study, since HIV infection is one of the major risk factors for TB in sub-Saharan Africa. In addition, these age groups are prone to many infectious diseases especially those transmitted through closed contact. Another plausible explanation could be due to increased outdoor activities, poor personal hygiene and overcrowding commonly associated with the age group. This finding is comparable to those reported by Nwachukwu et al⁹ and WHO¹ Reference reported a higher prevalence in those between the ages 20 and 40. However, the study by Okonko was not in agreement with this study, and it found a higher prevalence in those aged 40 and above.¹⁰ The prevalence of sputum smear positive TB is much higher than the one reported in earlier studies among the study population by Zailani et al (12.78%).¹¹ The variation in prevalence rate with previous studies could perhaps be due to improvement in the diagnosis of TB due to the DOTS strategy which creates public awareness of the symptoms and signs of Pulmonary TB especially chronic cough and, enhanced detection techniques. The fact that the facility is currently one of the main ART programme sites in the region might have contributed to the increase in TB screening offered to all patients with complains of chronic cough. In another earlier work Yusuph and colleagues¹² reported a higher prevalence of 63.6% in the same region. The significantly higher prevalence rate here was perhaps because the study was not restricted to those with chronic cough alone. However, the prevalence in this study was comparable to the prevalence in another study that used a more sensitive technique.¹³ The higher prevalence in this study compared with other regions of Africa¹⁴⁻¹⁵ may be explained by the fact

that the study was carried out in the hospital that serves as a referral site for other secondary care hospitals with no DOTS services. Furthermore, the influx of internally displaced persons (IDPs) from some parts of the region into the metropolis might have further influenced the high prevalence recorded in this study.

The higher prevalence of sputum smear positivity among male patients compared to females in the study is in keeping with those reported by Alfred and Silas in Uyo, Akwa Ibom Nigeria,¹⁶ Obioma in Port Harcourt¹⁷ and Kehinde in Ibadan Nigeria.¹⁸ This may be due to differences in health seeking behavior between the two genders as well as indiscriminate use of drugs, exposure to patient with TB, and inhalation of substances harmful to the lungs that are more common among males than females in the study area.

The number of sputum smears positive TB in those who were previously treated was low. This might signify a functional DOTS strategy in this community. A good number of HIV positive individuals were also sputum smear positive for TB, a situation akin to what is obtainable in many high burden HIV areas.^{1,19}

CONCLUSION

This study has shown that the prevalence of sputum smear positivity among patients with complaints of chronic cough in the area is high.; higher among males and those aged 20-39. The high prevalence could have attributed to the fact that the DOTS strategy has improved the detection of PTB in this area, and all patients with chronic cough should be evaluated to rule out active PTB. The low number of previously treated cases among the sputum smears positive patient's points to the efficiency of the DOTS programme in this community. The study also highlighted the association between HIV and PTB.

RECOMMENDATIONS

We recommend that all patients with cough lasting 2 or more weeks be evaluated for PTB and especially in those who are HIV positive. The study also recommends the strengthening of DOTS programme in high TB burden areas for effective TB control.

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