Original Article

PATTERN OF CLINICAL PRESENTATION OF ADULT PRESUMPTIVE PULMONARY TUBERCULOSIS PATIENTS IN NNAMDI AZIKIWE UNIVERSITY TEACHING HOSPITAL, NNEWI, ANAMBRA STATE, NIGERIA.

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ABSTRACT

Tuberculosis (TB) is a public health issue in Nigeria. The TB bacilli primarily attack the lungs, giving rise to clinical manifestations like cough lasting for ≥ 2 weeks, sputum that may be blood stained, chest pain, fever, weight loss, among others. This study assessed the pattern of clinical presentations of adult presumptive pulmonary tuberculosis (PTB) patients in NAUTH Nnewi,

Anambra State, Nigeria. A descriptive cross-sectional study was carried out among 180 adults presumptive PTB patients aged ≥ 18 years who presented to TB centre, NAUTH Nnewi, between June and September 2024. A semi-structured, interviewer-administered questionnaire was used to obtain socio-demographic and clinical data, while sputum samples were examined using Gene X pert assay. Data was analysed using SPSS version 25. Majority of the respondents (52.8%) were males. The mean age was 40.46 ± 15.72 years. Majority of the respondents had cough > 2 weeks (82.2%), followed by unexplained fever > 1 week (61.7%), recent unexplained weight loss (60.6%), excessive night sweats (46.7%), other symptoms (chest- pain, shortness of breath, etc) (31.1%), and sputum mixed with blood (22.2%). The respondents had TB clinical manifestations like cough > 2 weeks, unexplained fever > 1 week, recent unexplained weight loss, excessive night sweats, other symptoms like chest-pain, shortness of breath, etc, and sputum mixed with blood. Through active case finding for presumptive PTB patients, the healthcare providers at the facility and community levels should identify early those with signs and symptoms of TB for immediate referral for diagnosis and prompt treatment.

INTRODUCTION

Tuberculosis is a communicable disease caused mainly by bacterium, *Mycobacterium tuberculosis*, and rarely by *Mycobacterium bovis or Mycobacterium africanum*.[1] It constitutes a global public health problem, but the disease burden is more in the low and middle-income countries. (LMICs.[1,2] In 2023, about 10.8 million people fell ill with TB globally, with an estimated 1.25 million deaths.[3] In the same year, there were more than 360,000 reported cases of TB in Nigeria.[4] TB death rate (per 100,000 people) in Nigeria was reported at 28 % in 2023.[5] Incidentally,

Anambra state, in south east Nigeria, has been found to be one of the high TB burden states.[6] In addition to the increasing morbidity and mortality caused by TB, the disease burden in Nigeria impacts negatively on the country's growth and development.[7] Infection transmission is majorly by airborne droplets from sputum of infected persons with active TB.[8] TB bacilli are spread while coughing, spitting, sneezing, talking, or even singing.[8] The TB bacilli mainly attack the lungs (>80% of cases), leading to chronic inflammation and progressive lung damage.[8] This is known as pulmonary tuberculosis. In less than 20% of cases, the bacilli can attack other parts of the body like the lymph nodes, spine, brain, kidneys, abdomen, etc, leading to impaired organ function and even death, if left untreated. This is known as extra-pulmonary tuberculosis (EPTB).[8]

The commonest symptoms of PTB include persistent cough lasting for ≥ 2 weeks, sputum that may be blood stained, chest pain, shortness of breath, other constitutional symptoms like body weakness, fever, weight loss, drenching night sweats, loss of appetite, among others.[8] The symptoms of EPTB depend on the organ or site that is affected; for instance, pain or swelling on the back may be caused by TB of the spine;

haematuria may be caused by TB of the kidney; while lymphatic TB may cause swollen and non-tender lymph nodes, usually at the base of the neck, which may drain pus.[8] Usually, constitutional symptoms are present irrespective of the site of the disease. [8] Both sexes and all age groups are at risk but the disease is commoner in men and affects mostly the adults in economically productive groups.[9]

A person who presents with symptoms or signs of TB is known as presumptive TB (formerly known as a TB suspect).[8,10] Presumptive TB patients may not seek health care or may even delay in seeking health care from health facilities, and constitute a pool of missing cases of TB, who are potential risks of prolonged disease transmission in the communities. [8,10–12] Symptoms of TB may be mild for several months in those with active TB thereby leading to delays in seeking care with consequent disease transmission to others. In some cases, some people that have TB may be asymptomatic and may never present to the health facility.[13]

Diagnosis of TB begins with the identification of a presumptive TB, with a high suspicion of TB based on sound clinical judgment.[8] This could be effectively done through active TB case finding (ACF)

for presumptive TB patients, which entails systematic searching for the patients with symptoms or signs of TB outside the health facilities, symptomatic screening of the presumptive for TB, collecting their sputum samples for TB diagnosis, and referring those found to have TB for treatment.[8,14] Non-governmental partners for TB control, Community Health Workers (CHWs), private providers, private patent medical vendors (PPMVs), and the community pharmacists are involved in active case finding of presumptive PTB patients.

Early detection and treatment of TB are important in meeting the Sustainable Development Goal (SDG) and 'End TB' strategy targets set for 2035.[15] To end TB epidemic in Nigeria in line with 'End TB' strategy, the healthcare providers should be trained to be able to identify early those with signs and symptoms that are suggestive of TB and their immediate referral for diagnosis and treatment. This will enable patient cure, reduction in disease transmission, as well as prevention of development of resistant strains of the disease.

With the current Human Immunodeficiency Virus (HIV) trend, rising TB and Multidrug resistant- tuberculosis(MDR-TB) burden in the country, coupled with the issue of missing TB cases in Anambra State and the country at large, there is need for improved TB case detection, which requires engagement of all Health care providers (HCPs) in identifying people with TB, rapid scale-up of diagnostic capacity among others.[16] However, it is worthy to note that in spite of the fact that the commonest presenting symptom of TB is cough ≥ 2 weeks which may be accompanied by fever, weight loss, night sweats and other respiratory symptoms, absence of cough or fever does not rule out the diagnosis of TB in individuals with immuno-suppression (e.gs malnourished individuals, People Living with Human Immunodeficiency Virus, cancer patients, etc).[8]

Several studies have been carried out on TB in Nigeria, but there are few recent studies on the pattern of clinical presentation of adult presumptive PTB patients in Anambra State, Nigeria. Therefore, the findings from this research will provide valuable information to relevant agencies involved in TB prevention, management, and control and enable early diagnosis and disease treatment, thereby reducing morbidity and mortality. Also, the findings will help the policy makers and implementers to plan and design proper intervention strategies for TB control in the State and the country at large. This study aimed to assess the pattern of clinical presentation of

adult presumptive PTB patients in NAUTH Nnewi Anambra State, Nigeria.

MATERIALS AND METHODS

Study area

This study was carried out at NAUTH, Nnewi Anambra State, Nigeria. The hospital is located at old Oba Onitsha road in Nnewi–Ichi, in Nnewi North Local Government Area (LGA). It is a tertiary healthcare institution that serves as a site for the diagnosis and treatment of TB in Anambra State. The hospital serves as a referral centre for all presumptive TB cases seen in the hospital, or other private clinics in the state and its environs. As at 4th July, 2024, most of the clinical activities of the hospital have been moved to the permanent site, but the TB/Directly Observed Therapy Short-course (DOTS) activities of the hospital still take place at the temporary site. NAUTH Nnewi has a separate Gene Xpert MTB/RIF assay section with one Gene Xpert MTB/RIF assay machine that has 4 sample analysis potential at a time. The facility is currently the only TB/ DOTS facility in Nnewi North LGA that has Gene Xpert machine for the detection of TB and rifampicin resistant TB among presumptive TB cases. The use of Gene Xpert MTB/RIF as a primary diagnostic tool for TB diagnosis and detection of rifampicin resistance was introduced at NAUTH Nnewi in 2019. The facility is integrated with the National Tuberculosis and Leprosy Control Program (NTLBCP) and provides free anti-TB treatment and services to the public. The activities in the unit include screening of patients with suspected TB, as well as diagnosis of TB and drug-resistant TB (DR-TB) by using sputum and other biological samples for Gene Xpert MTB/RIF assay. The hospital has six annexes/outstations which are involved in TB management in their various capacities, with NAUTH Nnewi as the hub.

Study Design

This was a facility-based descriptive cross-sectional study of adult presumptive PTB patients presenting to or referred to NAUTH Nnewi within the study period.

Study Population

Adult (≥18 years) presumptive PTB patients presenting to TB/DOTS clinic of the selected health institution or referred from peripheral hospitals were randomly selected and enrolled at the time of the study.

Included in the study were

1) All presumptive PTB patient ≥18 years (adults) who consented to participate in the study.

2) All adult presumptive PTB patients presenting to TB/DOTS clinic or referred from peripheral hospitals within the study period.

3) All adult presumptive PTB patients presenting to TB/DOTS clinic who were bacteriologically confirmed to have PTB but are yet to start anti-TB drugs within the study period.

Excluded in the study were

1) All presumptive PTB patients below 18 years of age.

2) Adult presumptive PTB patients suspected to have extra-pulmonary TB.

3) Adult presumptive PTB patients who were too ill to participate in the study.

Sample Size Determination

The minimum sample size was calculated using the Fisher's formula for cross-sectional studies,[17] as shown below:

$$n = \frac{z^2 pq}{d^2}$$

Where :

n = the minimum sample size

z = the standard normal deviate at 95% confidence interval =1.96

p = the proportion of adult presumptive TB patients who had cough =86% [18] = 0.86

q=1.0-p =1.0-0.86= 0.14

d=degree of accuracy set at 0.05

Calculating n,

$$n = \frac{(1.96)^2 \times 0.86 \times 0.14}{(0.05)^2}$$

$$= \frac{3.8416 \times 0.86 \times 0.14}{0.0025}$$

=185.01 =185(approx)

Applying the formula for sample size when population <10,000,[17]

$$nf = \frac{n}{1+ (n)/(N)}$$

Where:

nf = the desired sample size when the population is less than 10,000

n= the desired sample size when the population is more than 10,000

N=the estimate of the population size

nf = 185/1+185/1000

= 185/1.185 =156

The calculated sample size was 156, but in order to compensate for non-response and errors due to sample collection, additional 10% of the minimum sample size was considered. Anticipating a non-response rate

(f) of 10%, therefore the adjusted sample size (n_s) selected was $n_s = n/1-f$

Given, $f = 10\% = 0.1$,

Then $n_s = \dfrac{156}{0.9} = 173.33 = 173$ approximately.

This implied minimum sample size of 173 participants for this study. However, 180 participants were recruited in this study.

Sampling technique

Simple random sampling technique was used to select the study participants who were recruited prospectively in a consecutive manner until the required sample size of 180 was obtained.

Demographic and clinical data collection

Semi-structured questionnaires were used to collect socio-demographic and clinical data from the respondents after prior informed consent. The questionnaires were administered to the respondents using face-to-face interviews conducted by the trained research assistants. The principal researcher maintained a site register where all the recruited participants were recorded after allocating them a unique study number. The participants were further evaluated for TB and drug resistant TB by using Gene X pert MTB/RIF assay to examine their sputum samples. Also, all the study participants were screened for HIV sero-positivity by standard protocols according to the national algorithm, using their blood samples.

Statistical Analysis

All completed data collection forms were examined for completeness, uniformity of responses, and clarity and then coded. Data were analysed using International Business Machines-Statistical Package for Social Sciences (IBM-SPSS) version 25. Frequencies and proportions were computed as descriptive measures for the variables. The results of the study were presented by using tables and charts to depict the socio-demographic and clinical variables.

Duration of Study

This study took place from June 1, 2024 to September 30, 2024.

Ethical Considerations

Ethical approval was obtained from the Nnamdi Azikiwe University Teaching Hospital Ethics Committee (NAUTHEC) with Reference number: NAUTH/CS/66/VER.3/77/2024/023.

Permission to conduct the study was obtained from the Head of TB/DOTS unit, NAUTH Nnewi. Patients' privacy and confidentiality were preserved as all personal information that could link a patient to the study were removed. Informed

consent was obtained from the study participants prior to the study. Participation **RESULTS**

A total of 180 adult presumptive PTB patients were examined using questionnaires between 1st June, 2024 and 30th September,

in the study was completely voluntary and at no cost to the consenting clients.

2024. All the questionnaires were retrieved, giving a response rate of 100%.

Table 1: Socio-demographic characteristics of the respondents

Variable	Frequency (n=180)	Percentage (%)
Age category(in years)		
18-24	38	21.1
25-34	35	19.4
35-44	32	17.8
45-54	41	22.8
55-64	20	11.1
≥ 65	14	7.8
Mean age ± SD	**40.46 ± 15.72**	
Minimum 18	**Maximum 82**	
Gender		
Male	95	52.8
Female	85	47.2
Tribe		
Ibo	167	92.8
Hausa	5	2.8
Yoruba	4	2.2
*[1]Others	4	2.2
Religion		
Christianity	168	93.3
Islam	3	1.7
Traditional	8	4.4
*[2]Others	1	0.6
Marital status		
Single	59	32.8
Married	86	47.8
Divorced	8	4.4
Separated	16	8.9
Widowed	11	6.1

Table 1 Continued: Socio-demographic characteristics of the respondents

Variable	Frequency (n=180)	Percentage (%)
Occupation		
Unemployed	34	18.9
Trading	64	35.6
Health Care Worker	12	6.7
Artisan	19	10.6
Teaching	8	4.4
*[3]Others	43	23.9
Highest level of education		
No formal education	3	1.7
Primary	39	21.7
Secondary	78	43.3
Tertiary	60	33.3
Average monthly income		
< 10,000	56	31.1
10,000-19,000	44	24.4
20,000-29,000	34	18.9
≥ 30,000	46	25.6
Type of residence		
Rural	53	29.4
Urban	127	70.6
HIV status		
Positive	57	31.7
Negative	123	68.3

*[1]Others = Ibibio, Tiv.

*[2]Others = Buddhism, Hinduism.

*[3]Others = Pastors, Drivers, Students

Table 1 summarizes the socio-demographic characteristics of the respondents. Their ages ranged from 18 to 82 years. The mean age of the respondents was 40.46 ± 15.72 years.

Majority of the respondents (22.8%) were in the 45-54 years age group. More than half of the respondents (52%) were males. Greater proportion of the respondents (43.3%) attained secondary level of education. Majority of the respondents were Ibos (92.8%) and Christians (93.3%). Greater proportion of the respondents were married (47.8%), traders (35.6%), and were earning <10,000 per month on the average (31.1%). Majority of the respondents (70.6%) were urban residents, while 31.7% of them had positive HIV status.
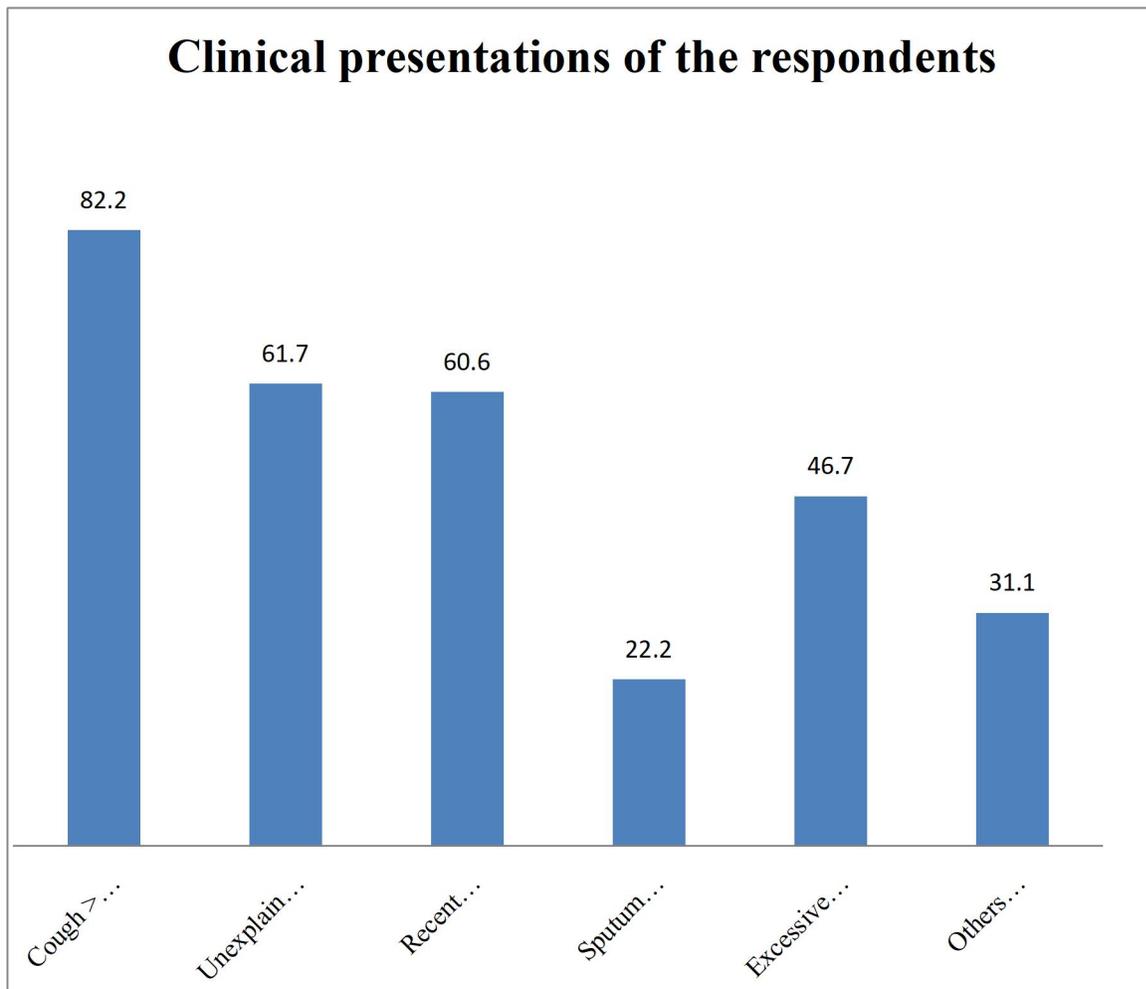

Figure 1: Clinical presentations of the respondents

Figure 1 shows the pattern of clinical presentations by the respondents. Majority of the respondents had cough >2 weeks (82.2%), followed by unexplained fever > 1 week (61.7%), recent unexplained weight loss (60.6%), excessive night sweats > 1week (46.7%), other symptoms (chest- pain,

shortness of breath, etc) (31.1%), and sputum mixed with blood (22.2%).

DISCUSSION

This study was carried out to assess the pattern of clinical presentation of adult presumptive PTB patients in NAUTH Nnewi Anambra State, Nigeria. The age range of the respondents was 18 to 82 years, which is almost similar to what was found in a study that was conducted in Ethiopia where the age range of the respondents was 18 to 91 years.[19]. The mean age of the respondents is 40.46 ± 15.72 years, which is higher than what was found in a similar study that was done by Andarge et al.,[20] where the mean age of the respondents was found to be 38.5 ±14.5 years. The disparity in the mean age could be likely due to the variations in the sample size and age composition in the different studies. Majority of the respondents in the present study are in the age range of 45-54 years, showing that they are adults in their most productive years. A similar study that was carried out in Nigeria also showed that majority of the respondents were in their economically productive years.[21]

In this study, majority of the respondents had cough >2 weeks (82.2%), followed by unexplained fever > 1 week (61.7%), recent unexplained weight loss (60.6%), excessive night sweats > 1week (46.7%), other symptoms (chest- pain, shortness of breath, etc) (31.1%), and sputum mixed with blood (22.2%). The three most   symptoms (cough > 2 weeks, fever, and weight loss) presented by the respondents in the present study, is similar to what was found in studies that were done in India[22] and Nepal[23], though with varied proportions. Contrary to the finding in the present study, fever was the commonest presentation in 79.42% of patients, followed by cough (78.46%), anorexia (51.67%),   and weight loss (49.76%) in a descriptive cross-sectional study that was conducted in Nepal.[24] The clinical manifestations of the presumptive PTB patients in a study that was carried out in Ethiopia were cough that was productive of sputum in 97.2% of the respondents, night-sweats (93.4%), chest pain (71.4%), fever (63.1%), loss of appetite (70.9%), fatigue (97.6%), and excessive weight loss (66%)[25], contrary to the pattern of the presentation in the present study. Other patterns of clinical presentation have reported in other studies.[26–29]

Cough ≥ 2 weeks with sputum which may sometimes be blood stained, remains the

most common symptom of active lung TB [8]. However, a person that has TB/HIV co-infection is considered to be a presumptive TB case if he/she has cough of any duration which may be accompanied by other symptoms like fever, weight loss, night sweats, chest pain, body weakness, among others.[8] In order to improve TB case detection, there is need for a high index of suspicion for TB by the individuals in various communities, as well as the healthcare providers in the various facilities and communities.

This study has assessed the Gene Xpert outcomes of adult presumptive PTB patients in NAUTH Nnewi, Anambra State, Nigeria. However, the presumptive TB patients below 18 years of age, and the presumptive patients with extra pulmonary TB were not assessed. Further research in these areas needs to be done. Also, carrying out a community based study, is a potential area for future studies. A major limitation of this study is the fact that the research was carried out in only one health institution which can affect the extent of making the generalization about the study. It would have been better if a number of health institutions were incorporated for a better representation of the study subjects.

CONCLUSION

The clinical pattern of presentation by the respondents in the present study shows that majority of the respondents had cough >2 weeks (82.2%), followed by unexplained fever > 1 week (61.7%), recent unexplained weight loss (60.6%), excessive night sweats > 1week (46.7%), other symptoms (chest- pain, shortness of breath, etc) (31.1%), and sputum mixed with blood (22.2%). Through active case finding for presumptive PTB patients, the healthcare providers at the facility and community levels should identify early those with signs and symptoms of TB for immediate referral for diagnosis and prompt treatment. This will enable patient cure, reduction in disease transmission, as well as prevention of development of resistant strains of the disease.

CONFLICT OF INTEREST: Authors declared no conflict of interests in this study.

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