Evaluation of Prevalence of Tuberculosis in Five (5) Dots Centres in Abia State, Nigeria

[1] Comfort Okorie, [2] Julia Ibebuike and [2] Chinelo C. N. Vincent

[1]Department of Nursing Science, Abia State Ministry of Health, Abia State, Nigeria
[2]Department of Nursing Science, Imo State University, Owerri, Imo State, Nigeria

Corresponding Authors Email:
agwaracomsy@gmail.com

Abstract

This study evaluated the prevalence of tuberculosis (TB) in Five (5) DOTS Centres in Abia State, Nigeria. The study adopted a retrospective study design. The target population for the study comprised of 975 tuberculosis patients who registered for tuberculosis treatment (both out and in patients) and were registered in the National Tuberculosis and Leprosy Control Programme (NTBLCP) register at the five DOT facilities of Abia State from 1st January, 2017 to 31st December, 2021. A total sample size of 975 patients was used for the study, obtained using the census sampling technique. Instruments for data collection was the NTBLCP register as well as patients' case files within the period under review. The instruments for data collection (Proforma) were validated by three experts in Measurement and Evaluation of AlvanIkoku University of Education Owerri, Public Health Department of Abia State Ministry of Health and the Research Supervisor. The reliability of the instrument remained what it supposed to be since it is a proforma (document) that could not be tampered, used globally. Data collected were analyzed using the descriptive analytical tools of percentage frequencies while the mean statistics and regression (ANOVA) was used to test the hypothesis. Findings of the study revealed that there was generally a higher percentage of tuberculosis prevalence among the males than the females in the DOTS Centres of Abia State, that TB prevalence was recorded highest among the age group of between 21-40 years old, smear positive PTB recorded highest prevalence (67.6%) while newly treated PTB recorded high prevalence of 972(99.7%). Recommendations were proffered among which are: public enlightenment on TB should be intensified in order to meet the SDG goals, contact tracing should also be carried out on households with TB cases, patients with confirmed cases of TB should be encouraged to complete treatment as well as addressing socio-economic issues such as poor sanitation, overcrowding and poverty and incorporation of ART in DOTS Centre.

Keywords: Evaluation, Prevalence, Tuberculosis, Patients, DOTS,

Introduction

Tuberculosis (TB) is an infectious respiratory illness caused by an intracellular bacterium known as Mycobacterium tuberculosis.[1-5] According to the Federal Ministry of Health[6] a presumptive case of Tuberculosis is any person whether child or adult with clinical manifestations suggestive of TB (Pulmonary or extra pulmonary, or those with chest x-ray findings suggestive of active TB). About one-third of the world's populations are infected with the bacilli, while majority are left in an asymptomatic state of the disease called latency. Only a few individuals (10%) of those latently infected develop active TB, the majority (90%) will remain asymptomatic. Untreated smear-positive pulmonary tuberculosis (PTB) patients are the major source of infection; when the patient coughs, sneezes or spits out tiny droplets which contain tubercules that are transmitted through inhalation of these droplet nuclei.[7-13]

Typically, PTB affects the lungs but other sites can also be infected as well extra pulmonary TB (EPTB) (Federal Ministry of Health.[6] Symptoms of TB infection include cough (lasting for 3 weeks or more without sputum production, chest pain, haemoptysis (coughing up blood), fever, fatigue, weight loss that cannot be explained and loss of appetite, while the symptoms of EPTB depends on the part of the body being affected but may include blood in urine (TB of kidney), hoarseness (TB of larynx), confusion or headaches (TB of meninges) and back pain (TB of spine).[7]

Globally, TB is a major public health issue especially in developing countries.[14] WHO1[5] reported that a total of 1.5 million people died from TB (including 214 000 people with HIV), it is also the 13th leading cause of death and the second leading infectious killer disease after COVID-19 and HIV/AIDS. They also estimated that 10 million people fell ill with tuberculosis (TB) worldwide comprising of 5.6 million men, 3.3 million women and 1.1 million children. This shows TB is present in all countries and age groups.[15]

Sub Saharan Africa has the highest burden of tuberculosis and the slowest decline in the number of tuberculosis incident cases.[16] Studies have shown that about 95% of TB cases occur among the resources limited communities of the developing countries of the world. West Africa, with a population of about 376 million people, is not left out as poverty and lack of development keep promoting the spread of TB. In the year 2016, globally, WHO African region accounted for 25% of the estimated number of TB incident cases. Also, in 2015, the number of estimated TB cases reported in Liberia, Guinea, and Sierra Leone, which are the post-Ebola countries was estimated to be 29809. Liberia and Sierra Leone TB incidence rate was estimated to be 308 and 304 cases per 100000 population; respectively.[17]

Nevertheless, one critical reason for increased prevalence and persistent infection among the vulnerable or susceptible groups have been said to be drug resistance fall out to two main first line drugs, which are rifampicin and isoniazid and weak health systems that are unable to support efficient scale-up of TB services.[18-23] The objective is to determine the prevalence of tuberculosis in five DOTS facilities in Abia State.

Methods and Materials

This is a retrospective study of TB Treatment in Federal Medical Centre, Amachara General hospital, Infectious Disease Hospital, Aba health office and TBL Referral Centre Uzuakoli, all in Abia State.

Source population

The source population consisted of all TB patient records registered in the five TB facilities between January 1st, 2017, and December 31st 2021.

Study Area

The study was conducted in Abia State. Civil servants make up the majority of the local population while only few engages in trading and farming activities, Subjects were drawn from four state owned and one federal owned hospital located in five Local Government Areas of the State namely; Amachara General Hospital Umuahia South LGA, Federal Medical Centre (FMC) Umuahia, Umuahia North LGA, TB and leprosy Referral Centre Uzuakoli, Bende LGA, Infectious Disease Hospital (IDH), Aba North LGA, and Health Office Aba South LGA. The DOTS centers function in accordance with Nigeria's National TB and Leprosy Program. Sputum samples from patients who tested positive for Xpert MTB/RIF and/or acid-fast bacilli were regarded as PTB patients who had positive smears. Smear-negative PTB were diagnosed using clinical characteristics and results from chest radiography suggestive of tuberculosis.

Study Population

The records of 975 TB patients from five DOTS facilities within the state were obtained and examined by the researchers from 1st January 2017 to 31st December 2021.

Inclusion and Exclusion Criteria

The records of all cases of pulmonary and extrapulmonary TB patients with known HIV statuses, whose weights are equal to or above 18kilogram (kg) registered at the facilities were included. Moreover, all improperly documented TB cases, transferred out and MDR-TB cases, patients with unknown HIV statuses and patients that weigh less than 18kg were excluded from the study.

Sample Size and Sampling Technique

The sample size for the study comprised 975 tuberculosis patients registered and treated from January 2017 to December 2021 in the selected DOTS facilities were included in the study.

Method of Data Collection

Data were gathered through the evaluation of NTBLCP central register, treatment cards, and case notes. A standard proforma was created to correspond with the NTBLCP register specifically for the DOTS institutions for data collection. The data collected from the different TB facilities included gender, age, HIV status, type of TB, weight, bacteriology result and year of registration,

Variables

Tuberculosis prevalence was the dependent variable while age, gender, weight, HIV status, bacteriology result, type of TB and year of registration were the independent variables.

Ethical Clearance

The study was approved by the department of nursing sciences, Imo state university. Ethical approval was gotten from public health department of Abia State Ministry of Health and Ethics and research Committee of Federal Medical Centre Umuahia before data collection.

Results

Included in the study were all 975 documented TB cases which gave a 100% response rate. The patients mean age was 36.3 ± 20.5 years. Females recorded a prevalence rate 47.5% while the males dominate with a prevalence percentage of 52.5% respectively. 30.1% of the patients were between the ages of 21- 40 years and 29.2% were between the ages of 41 – 60 years and decline with age. However, Health office Aba which is the most populated DOTS Centre had a preponderance of 41% and Referral Centre Uzuakoli recorded 24.6%. The year 2017 and 2018 witnessed a peak prevalence rate of 20.8% and 21.4% respectively while it remained fairly constant from 2019 to 2021(Table 1).

Table 1: **Socio-demographic data of TB Patients from five DOTS Centres in Abia State**

Variables	Category	Frequency	Percentage (%)
Sex	Males	512	52.5
	Females	463	47.5
Age Group in years	0 – 20	269	27.6
	21 – 40	293	30.1
	41 – 60	285	29.2
	> 60	128	13.1
DOTS Centres	Amachara	157	16.1
	FMC	103	10.6
	Health Office	400	41
	IDH	75	7.7
	Referral Centre Uzuakoli	240	24.6

Year of Registration	2017	203	20.8
	2018	209	21.4
	2019	187	19.2
	2020	190	19.5
	2021	186	19.1

Based on the site of tuberculosis infection, data distribution reveals that most patients (99.7%) had pulmonary tuberculosis while only 3 cases (0.3%) of extra PTB was recorded. Over 50% of PTB (96.1) were newly treated cases and 1.6% of patients were recorded as treatment after loss to follow-up. Among all treated PTB cases, 67.6% were smear positive against 32.4% of patients who were smear negative PTB. The percentage of patients who were TB/HIV co-infected during the research period yielded a seroprevalence rate of 21.9% Table 2).

Table 2: **Clinical traits of TB patients from DOTS Centres in Abia State**

Variables	Category	Frequency	Percentage (%)
Type of TB by Site	Extra PTB	3	0.3
	PTB	972	99.7
Types of Patient	New	937	96.1
	Relapse	13	1.3
	Treatment after failure	9	1
	Treatment after loss to follow-up	16	1.6
Types of Bacteriology	Sputum smear positive	659	67.6
	Sputum smear negative	316	32.4
HIV status	Positive patients	214	21.9
	Negative patients	761	78.1

Table 3: **Analysis of Difference in the Treatment Outcome of Male and Female TB Patients in the DOT Centres**

Sources of variation	N	X	SD	df	T	Sig. (2 tailed)	Decision
Male	5	96.60	62.74	8	.043	.950	Not Sig.
Female	5	98.40	69.38				

* $\alpha = 0.05$, df = 8

Table 3 reveals mean analysis on prevalence TB between male and female patients in the DOT Centres of Abia State. Result reveals that there is no significant difference in the prevalence of male and female TB patients in the DOT Centres of Abia State.

Discussion

This study examined the prevalence of TB in various DOTS Centres within a five-year period. Findings revealed that Tuberculosis affected all age group but was more predominant (52.5%) in the male folks and young productive age (21- 40) in the economy. This is similar to the findings

of Alao *et al*. [24] The young people's vibrant and active responsibilities could be accountable for the increased prevalence of TB within this age bracket. Another reason is the poor feeding habits peculiar with this age group which predisposes them to infection. The preponderance of men may be related to low socioeconomic characteristics, such as crowded housing and harmful lifestyle choices like smoking, and open socialization which are more common in men.

There are also high cases of smear positive PTB 67.6% recorded in the study and few cases of treatment after loss to follow-up. This account for the high prevalence rate in the study locations as smear positive PTB has a high infectivity rate especially the untreated cases as pointed out by Azuonwu and Wokem.[7] The co-infection of HIV and TB also contributes to the spread of the TB epidemic. The findings from the study are lower as compared to the study of Ogbudebe *et al.*[25] who recorded 84.3% cases of smear positive PTB in urban slums in Aba. And higher than the previous study in South Africa[26] which reported 57.8% of bacteriological confirmed cases of TB. The difference in prevalence levels of TB cases may be explained by variations in patients' awareness levels, which could result in passive detection among those exhibiting disease signs and symptoms and the study locations which centered more on urban areas where TB concentration was low except health office Aba DOTS Centre which was situated in a densely populated urban area.

Conclusion

The study was conducted in five DOTS Centres located in five LGAs of Abia State Nigeria. The DOTS Centres are Amachara general hospital, FMC Umuahia, IDH Aba, Health office Aba, and Refferal Cenre Uzuakoli. The research findings indicated a high prevalence of TB especially among the males and young adults between the age ranges 21 – 40 years documented the highest prevalence. Rationale for this high prevalence was said to be due to poor standard of living, poor sanitation, overcrowding and high rate of defaulters with positive sputum smear which have a high infectivity rate.

Consequently, in order to meet the SDG goals, it is highly recommended that public enlightenment on TB should be intensified. Contact tracing should also be carried out on households with TB cases. Patients with confirmed case of TB should be encouraged to complete treatment. Addressing socio-economic issues such as poor sanitation, overcrowding and poverty and incorporation of ART in DOTS Centres will help to win the fight against TB.

References

1. Getie A, Alemnew B. Tuberculosis treatment outcomes and associated factors among patients treated at Woldia General Hospital in Northeast Ethiopia: An institutional based cross-sectional study. *DoveMedical Press*, 2020; (13): 3423-3429. https://doi.org/10.2147//DR.S275568
2. Obeagu EI. Tuberculosis diagnostic and treatment delays among patients in Uganda. Health Science Reports. 2023;6(11): e1700.
3. Obeagu EI, Onuoha EC. Tuberculosis among HIV Patients: A review of Prevalence and Associated Factors. Int. J. Adv. Res. Biol. Sci. 2023;10(9):128-34.

Citation: Okorie C, Ibebuike J, Vincent CCN. Evaluation of Prevalence of Tuberculosis in Five (5) Dots Centres in Abia State, Nigeria. Elite Journal of Public Health, 2024; 2 (4): 22-30

4. Obeagu EI, Obeagu GU. Human Immunodeficiency Virus and tuberculosis infection: A review of prevalence of associated factors. Int. J. Adv. Multidiscip. Res. 2023;10(10):56-62.

5. Obeagu EI, Okoroiwu IL, Nwanjo HU, Nwosu DC. Evaluation of haematological parameters of tuberculosis patients in Umuahia. Eur. J. Pharm. Med. Res. 2019;6(7):693-9.

6. Federal Ministry of Health. *National tuberculosis, leprosy and buruli ulcer management and control guidelines.* Workers Manual Department of Public Health, 2017; 7th Edition Nigeria.

7. Azuonwu O, Wokem GN. Investigation of prevalence of tuberculosis infection outcome in two government owned hospitals in Port-Harcourt, Niger Delta. *Journal of Tuberculosis and Therapeutics,* 2018*; 3(1), 114.* https://www.omicsonline.org/open-access/investigation-of-prevalence-of-tuberculosis-infection-outcome.

8. Swalehe HM, Obeagu EI. Tuberculosis: Current Diagnosis and Management. Elite Journal of Public Health. 2024;2(1):23-33.

9. Obeagu EI, Okoroiwu IL, Nwanjo HU, Nwosu DC. Evaluation of interferon-gamma, interleukin 6 and interleukin 10 in tuberculosis patients in Umuahia. Ann Clin Lab Res. 2019;7(2):307.

10. Obeagu E, Felix CE, MTB O, Chikodili UM, Nchekwubedi CS, Chinedum OK. Studies on some cytokines, CD4, iron status, hepcidin and some haematological parameters in pulmonary tuberculosis patients based on duration of treatment in Southeast, Nigeria. African Journal of Biological Sciences. 2021;3(1):146-156.

11. Oloro OH, Oke TO, Obeagu EI. Evaluation of coagulation profile patients with pulmonary tuberculosis and human immunodeficiency virus in Owo, Ondo state, Nigeria. Madonna University journal of Medicine and Health Sciences ISSN: 2814-3035. 2022;2(3):110-119.

12. Obeagu EI, Obeagu GU. Understanding Immune Cell Trafficking in Tuberculosis-HIV Coinfection: The Role of L-selectin Pathways. Elite Journal of Immunology. 2024;2(2):43-59.

13. Madekwe CC, Madekwe CC, Obeagu EI. Inequality of monitoring in human immunodeficiency virus, tuberculosis and malaria: a review. Madonna University journal of Medicine and Health Sciences. 2022;2(3):6-15.

14. Tola A, Minshore KM, Ayele Y, Mekuria AN. Tuberculosis treatment outcomes and associated factors among TB patients attending public hospitals in Harar Town, Eastern Ethiopia: A five year retrospective Study. *Tuberculosis Research and Treatment*, 2016; 1503219. https://doi.org/10.1155/2019/1503219

15. World Health Organization. Global tuberculosis report, 2020; https://www.reliefweb.in/report/world/global-tuberculosis-report-2020?gelid.

16. World Health Organization. Tuberculosis key facts. 2018; https://www.who.int/news-room/fact-sheets/detail/tuberculosis

17. Adebisi, Y. A., Agumage, D., Sylvanus, Y. D., Nawaila, I. J., Ekwere, W. A., Nasiru, O. E. E., Ekpenyong, A. M., Lucero, R. T. & Prisno, D. E. (2019). Burden of tuberculosis and challenges facing its eradication in West Africa. *International Journal of Infection,* 6(3), e92250 https://doi.org/10.5812/iji.92250.

18. Ogbuabor DC, Onwujekwe OE. Governance of tuberculosis control programme in Nigeria. *Infectious Diseases of Poverty Journal, 2019; 8 (45), 1-46*. https://www.idpjournal.biomedcentral.com/articles/10.1186/s40249-019-0556-2

19. Okoroiwu IL, Obeagu EI, Anaebo QB, Walter O. Evaluation of activated partial thromboplastin time and prothrombin time in HIV and TB patients in Owerri metropolis. J Pharm Res Int. 2022; 21:29-34.

20. Obeagu EI, Bot YS, Obeagu GU, Hassan AO. Factors contributing to treatment default by tuberculosis patients at art clinic: African perspective. Int J Curr Res Chem Pharm Sci. 2023;10(2):22-26.

21. Obeagu EI, Esimai BN, Obeagu GU, Ochiabuto OM, Chukwurah EF, Ekelozie IS, Ochei KC. Evaluation of Some Cytokines, CD4, Hepcidin, Iron Profile and Some Haematological Parameters of Pulmonary Tuberculosis Patients Coinfected with HIV in Southeast of Nigeria. Journal of Pharmaceutical Research International. 2020;32(13):118-130.

22. Obeagu EI, Obeagu GU. The Role of L-selectin in Tuberculosis and HIV Coinfection: Implications for Disease Diagnosis and Management. Elite Journal of Public Health. 2024;2(1):35-51.

23. Odo M, Obeagu EI, Ochei KC, Nkombe E, Olusola-Falae B, Effa E, Affirima B. Intensified TB Case finding in PMTCT settings in Nigeria should be reconsidered. Int. J. Adv. Res. Biol. Sci. 2016;3(2):85-92.

24. Alao MA, Maroushek SR, Chan YH, Asinobi AO, Shisher TM, Gbadero DA. Treatment outcomes of Nigerian patients with Tuberculosis; A retrospective 25-year review in a regional medical centre. *PLOS ONE,* 2020*;* 15(10), e0239225. https://doi.org/10.1371/journal.pone.0239225.

25. Ogbudebe CL, Izuogu S, Aabu CE. Magnitude and treatment outcomes of pulmonary tuberculosis patients in a poor urban slum of Abia State, Nigeria. *International Journal of Mycobacteriology, 2016;* 5(2), 205-210. https://doi.org/10.10.1016/j.ijmyco.2016.03.003.

26. Department of Health. The first national TB prevalence survey, South Africa, 2018: Short Report. Retrieved from https://www.nicd.ac.za/wp-content/uploads/2021/02/TB-Prevalence-survey-report_A4_SA_TPS-Short_Feb-2021.pdf on 31st March, 2024.