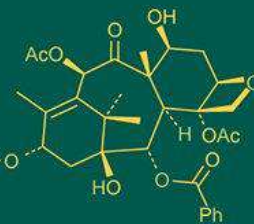
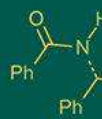
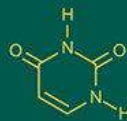


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A 3 year retrospective study on the pattern and prevalence of extra pulmonary tuberculosis in JOS, Plateau state: Nigeria

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Abstract

In 2017, the World Health Organization reported that the prevalence of EPTB was 15% globally from amongst the world global burden of tuberculosis. Furthermore, researches done and ongoing have and are showing three main problems, challenges with accurate diagnosis, the low cure rate and the high death rate. The aim of this study was to retrospectively evaluate the pattern and prevalence of pulmonary tuberculosis in Jos, Plateau state; Nigeria. This was done using a quantitative analytical pattern to study the incidences of 862 patients, from which 127 were diagnosed with Extrapulmonary Tuberculosis. While we had a prevalence of 14.7%, we got an average cure rate of 1.6% and an average death rate of 23.6%.

Keywords: EPTB, extrapulmonary tuberculosis, Nigeria, prevalence, JOS, plateau state

Introduction

About a third of the world's population is latently infected with *Mycobacterium tuberculosis*. This simply means that though they have been infected with this bacterium, they are not yet sick with TB and hence can only act as carriers, and not transmitters of the disease in the time being ^[1].

There is tuberculosis in every part of the world. In fact, as at 2015 the largest number of new cases occurred in Asia, with over 61% of newly diagnosed cases. This was followed by Africa, where there were over 26% of the newly diagnosed cases. Tuberculosis (TB) is the ninth leading cause of death worldwide and the leading cause from a single infectious agent, even ranking higher than HIV/AIDS ^[2].

In 2016, about 2.5 million people came down with TB in Africa, accounting for over 25% of new TB cases worldwide. An estimated 417,000 people died from the disease in Africa in 2016, with about 1.7 million globally in the same year ^[3].

In the year 2015, 87% of new TB cases occurred in the 30 high TB burden countries. With only Six countries accounting for 60% of the new TB cases: India, Indonesia, China, Nigeria, Pakistan, and South Africa. A similar statistic was seen in the year 2017, where 87% of the global burden of TB was seen from amongst the 30 high burden countries. Nigeria is not just amongst the 30 high burden countries, it is leading Africa in case burdens ^[2, 4].

About 407,000 people in Nigeria get infected with TB each year. This estimate covers only the people who are HIV negative. There is a whole different 63,000 HIV positive people that get TB each year. While an estimated 115,000 HIV negative people die from TB in Nigeria each year. Then an estimated 39,000 HIV positive people also die ^[5].

However, Since the year 2000, over 53 million lives have been saved through effective diagnosis and treatment. With Active, drug-sensitive TB disease is treated with a standard 6-month course of 4 antimicrobial drugs that are provided with information, supervision and support to the patient by a health worker or trained volunteer. Hence, the vast majority of TB cases can be cured when medicines are provided and taken properly ^[2].

Although the main anatomical pathology of TB is often primarily in the lungs, it can also affect other areas of the body, this is known as extrapulmonary TB (EPTB). Extrapulmonary simply attests to the fact that TB is a multisystemic disease. It can affect any organ or system with an exclusion of the hair and nails.

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Extra pulmonary TB is often poorly diagnosed in time and can thus lead to various complications. TB has not only been seen to lead to male and female infertility, some studies have even described sexually transmission of TB [6-8]. The prevalence of EPTB varies from region to region, country to country and continent to continent. In fact, while PTB is primarily often seen as a disease of the lower-class citizens, EPTB has been -in some studies- linked to an increase rate in immigration. Furthermore, in this same study an inference was made, stating that unlike PTB, EPTB was not on a decline. This was because the prevalence increased from 16.4% in 2002 to 22.4% in 2011 in Europe. [9]. Due to the atypical presentations of EPTB, there are challenges with its diagnosis. This was studied by Solovic and colleague. Although they did state that there were regional variations in the incidence and prevalence of EPTB. In Australia, the incidence rate of EPTB was found to be 24.3%, at about the same time the same was seen to be 13.3% in Southern-Taiwan [10-12].

Mazza-Stalder and colleagues on concluding their study made the conclusion that the prevalence was actually on an increase, similar to the deduction made by Sandgren and colleagues [9] [11]. These findings were supported by another study by Garcia-Rodriguez and co when they found a significant increase in prevalence of EPTB from 30.6% between 1991-1996 to 37.6% in 2003-2008. They concluded that though there is a decline in the general prevalence of TB, this decline was more amongst PTB, as EPTB was in fact on a rise. They proposed that this may be linked to the

decline in number of Bacillus Calmette-Guerin (BCG) vaccinated patients. They also linked this to the predominance of women in the population. Hence stating that the gender prevalence of EPTB is higher in the females. [13].

The aim of this study is to retrospectively evaluate the pattern and prevalence of pulmonary tuberculosis in Jos, Plateau state; Nigeria.

Methodology

It was a cross-sectional descriptive study that evaluate 862 patients over a period of 3 years (2016, 2017 and 2018). The study utilized a validated data tool to obtain the required information. Data was obtained from the DOT clinics of the Bingham University Teaching Hospital (BhUTH) and the Plateau Specialist Hospital (PSSH). Data was analyzed using a Microsoft excel and the MS excel statistical tools. Ethical clearance for this study was sought for and granted from the ethical committees of the Bingham University Teaching Hospital and that of the plateau Specialist Hospital.

Result

- Of the 826 cases of Tuberculosis reported to between 2016 and 2018, 127 of them were diagnosed with EPTB.
- There were various forms reported, TB adenitis was the most prevalent. Others were Disseminated TB, Abdominal TB, TB meningitis and TB Arthritis.

Table 1: Showing the distribution and pattern of EPTB that presented between 2016 and 2018

Parameters		Bhuth		Pssh		Total	
Distribution	Years	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Total number of cases reported	2016	122	100%	187	100%	309	100%
	2017	141	100%	140	100%	281	100%
	2018	106	100%	166	100%	272	100%
Total	Total	369	100%	493	100%	862	100%
Extra Pulmonary Tuberculosis Cases Reported	2016	22	18.0%	25	13.4%	47	14.9%
	Male	11	50%	8	32%	19	40.4%
	Female	11	50%	17	68%	28	59.6%
	2017	22	15.6%	18	12.9%	40	14.2%
	Male	7	31.8%	12	66.7%	19	47.5%
	Female	15	68.2%	6	33.3%	21	52.5%
	2018	12	11.3%	29	17.5%	41	15.1%
	Male	9	75%	13	44.8%	22	53.7%
	Female	3	25%	16	55.2%	19	46.3%
	Total	55	14.9%	72	14.6%	127	14.7%
Patients with extra PTB cured	2016	1	4.5%	0	0.0%	1	2.1%
	2017	0	0.0%	0	0.0%	0	0.0%
	2018	0	0.0%	1	3.4%	1	2.4%
Total	Total	1	1.8%	1	1.4%	2	1.6%
Total number of deaths from TB	2016	19	15.6%	47	25.1%	66	21.4%
	2017	26	18.4%	17	12.1%	43	15.3%
	2018	17	16.0%	24	14.5%	41	15.1%
Total	Total	62	16.8%	88	17.8%	150	30.4%
Extra pulmommnary TB patients who died	2016	4	18.2%	8	32.0%	12	25.5%
	2017	5	22.7%	2	11.1%	7	17.5%
	2018	6	50.0%	5	17.2%	11	26.8%
Total	Total	15	30.0%	15	20.8%	30	23.6%
Extra pulmommnary TB deaths in TB death pool	2016	4	21.1%	8	17.0%	12	18.2%
	2017	5	19.2%	2	11.8%	7	16.3%
	2018	6	35.3%	5	20.8%	11	26.8%
Total	Total	15	24.2%	15	17.0%	30	20.0%

The table shows the EPTB distribution illustrates that averagely the prevalence of EPTB is 14.7%. There is a slow but evident increase in the prevalence of EPTB over the

years. Furthermore, the probability of getting cured is as low as 2.1%. This is accompanied by a more prevalent mortality probability of 20% of all TB deaths.

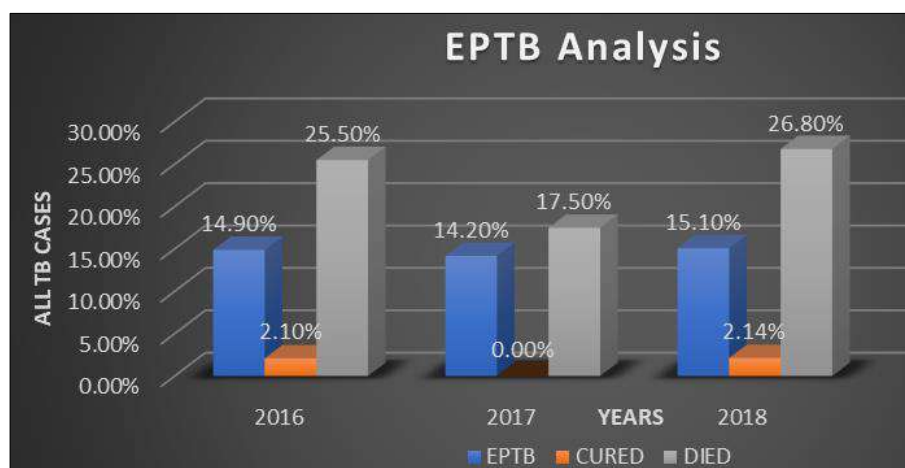


Fig 1: Bar chart showing the graphical representation of the table above. Highlighting the Extra Pulmonary TB cases reported, the patients who were cured and those who died from Extra Pulmonary TB.

Discussion

The aim of this study was to retrospectively evaluate the pattern and prevalence of pulmonary tuberculosis in Jos, Plateau state; Nigeria. This was done using a quantitative analytical pattern to study the incidences of 862 patients, from which 127 were diagnosed with Extrapulmonary Tuberculosis.

From the study, it is clear that the prevalence of EPTB is on a rise. A deduction of the average annual prevalence was calculated to be 14.7%. Although the yearly prevalence between 2016 and 2018 ranged from 14.2%-15.1%. This was different from studies done in Australia and Europe who had higher yearly prevalence's; however, it was in keeping with a study done in Southern Taiwan. The findings in this study were also in keeping with the WHO report of 2017, that found the prevalence of EPTB globally to be 15% [14]. Nevertheless, there is a variation in prevalence of EPTB globally, as it is a whole pathology on its own with predisposing factors that vary in different regions and parts of the world [9-12]. As the ability to make an accurate and timely diagnosis is a challenge in most parts of the world, as accurate diagnosis of EPTB is still in fact a global challenge [6].

As regards the prevalence by gender, women had a higher prevalence than men with EPTB. This is in keeping with findings similar to that done by Mazza and colleagues and also another 15 years retrospective study at Accra, Ghana by Ohene *et al.* in 2019. [11, 15]. This was due to the fact that while PTB had a higher occurrence amongst men, EPTB generally has a higher occurrence amongst women. This was also offered as an explanation as to why the prevalence of EPTB was seen to be on a rise, in contrast to the general global burden of the TB disease. It was because the world has an ever-rising global numerical dominance of females [11]. Furthermore, it was discovered that there was a very low cure rate (1.6%) for people being treated for EPTB. This may be explained by the fact that most of those who come down with EPTB are often HIV positive and hence have a poorer outcome; there is a delay in diagnosis and presentation; The patients with EPTB have a higher chance of treatment failure in comparison to PTB; or the drugs available for treatment are not so effective. The findings in

this study were similar to a study done by Ohene *et al.* in Accra, Ghana where they found out that the prevalence of cure amongst EPTB patients was 0.9%, which constituted 6 patients out of 728. This same study also discovered that older age groups and HIV positivity was associated with higher mortalities amongst EPTB patients [15].

Sadly, the death rate from EPTB was way more pronounced than the cure rate according to findings in this study. The death rates ranged from 17.5 to 26.8%, with an average death rate of 23.6%. This does not vary greatly from a similar study in Ghana, where their overall death rate was reported to be 28.7% [15].

The limitations of this study however were, a small sample load of EPTB positive patients, not giving differential details as to the regional and anatomical sites associated with TB and also not making a differential HIV prevalence to help deduce the susceptibility of HIV patients to EPTB.

Conclusion

This study proves that there is an increase in the prevalence of EPTB in Jos, Plateau state; Nigeria. On an average, the percentage of EPTB amongst reported TB cases is 14.7%. However, the prognosis for these patients is not promising with a 1.6% cure rate. Furthermore, the study goes to show that while the cure rates are within lower decimals, the death rates are high (23.6%).

Abbreviations

DOT: Directly Observed Treatment

TB: Tuberculosis

PTB: Pulmonary Tuberculosis

WHO: World Health Organization

Conflict of interest

The Author declares no conflict of interest in this study.

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