Eastern Heartland Journal of Medicine

KNOWLEDGE OF TRANSMISSION OF TUBERCULOSIS AND FATE OF UNIVERSITY AND POLYTECHNIC UNDERGRADUTES MANAGED FOR TUBERCULOSIS IN A TREATMENT FACILITY IN SOUTH EASTERN NIGERIA: OUR EXPERIENCE.

Dr. Godwin C Mbata*, Dr. Eugenia O Ofondu*, Dr. Francis O Nwako*, Dr. Chibueze OU Eke*, Ijeoma Ninian Mbata**

*Dept. of Medicine, Federal Medical Center Owerri.

Dept. of Nursing Sciences, Imo State University Teaching Hospital.

Corresponding author: Dr. G C Mbata. Phone: 234- 803 356 9235. E- mail: mbatag@yahoo.com,

Running title: The fate of Undergraduates managed for TB in Imo State.

Word Count: 3037

ABSTRACT

Aim: To evaluate the knowledge of tuberculosis transmission and effect of TB on University and Polytechnic undergraduates managed for tuberculosis (TB) in a treatment centre in Imo Sate, Nigeria.

Setting: Federal Medical Centre Owerri; Eastern Nigeria.

Methods: This was a descriptive cross sectional study done from August 2011-July 2013. Fifty-eight eligible undergraduates across Imo state who were on DOTS at the FMC Owerri were enrolled. Questions were asked on how TB infection can be transmitted from a patient to someone who doesn't have TB and factors that facilitate TB transmission. Discussions were held on individual basis between the patients, the care givers and parents/guardian on the various effects of TB on patient's career and psychosocial life; including patients' financial difficulties and progression in academic activities. Information collected were documented and analyzed.

Results: Of the 415 patients treated for TB during the study, fifty-eight (14%) were undergraduates across the state; 28 males and 30 females with M: F ratio of 1:1.07. Five (8.6%) had TB/HIV co-infection. Awareness on mode of transmission of tuberculosis was found to be 47 (81%) among the undergradutes treated for tuberculosis. It was found that the patients had better awareness on mode of transmission of HIV 56(96%) than of TB transmission 47(81%). Twenty-eight (48.3%) were living ≥ 3 in a room while ten (17.2%) had their career completely stopped. Psychosocial disorders were common in the subjects. Significant proportion of the subjects' parent/guardian had their income reduced.

Conclusion: Tuberculosis poses an enormous burden on the students in tertiary institutions in Imo state with a significant number of them stopping their career or having it unnecessarily prolonged. A holistic care of patients in this category should be ensured to ensure their career is not affected by this illness. We also add that more awareness needs to be created on the mode of transmission of TB to enable us check further spread.

Keywords: *Tuberculosis, Awareness, effect, tertiary institution, South-East Nigeria.*

INTRODUCTION

Tuberculosis remains a global health problem and causes more morbidity and mortality greater than any other infectious disease[1, 2, 3]. The 2010 World Health Organization (WHO) Global TB control report showed a profile of 212 countries and territories; with Nigeria assuming 4th position on this list of countries with most number of reported cases[1]. Over the years there has been remarkable improvement in case detection, data collection and management of TB. The 2014 Global tuberculosis report includes data compiled from 202 countries and territories showing estimated cases of 9.0 million TB with 1.5 million deaths from the disease [4]. Nigeria has shown remarkable improvement in case detection and data collection with the country ranking 13th position in 2013 compared to 4th position in 2010 among the countries with high TB burden [4]. Of the estimated 9 million people who developed TB in 2013 more than half (56%) were in South-East Asia and the West Pacific Regions. A Further one quarter was in the African region, which also has the highest rates of cases and death relative to the population [4]. About 60% of TB cases and deaths occur among men, but the burden of disease among women is also high. In 2013, an estimated 510,000 women died as a result of TB, more than one third of whom were HIV-positive. There were 80,000 deaths from TB among HIV-negative children in the same year[4]. However, given that most deaths from TB are preventable, the death toll is unacceptably high and efforts to combat it must be accelerated. Tuberculosis is the leading infectious killer of people with HIV/AIDS. World-wide a third of people with HIV also suffer from TB[1]. Current data showed Global TB cases in 2017 to be 10 million with estimated death of 1.3 million people. Recent WHO TB data showed that Nigeria ranked 6th among the list of 30 countries with highest TB burden with a total number 104,904 cases [5]. TB treatment coverage in Nigeria is 24% with TB case fatality ratio average of 0.38. The national TB budget is about 409 million USSD with 8% domestic funding, 16% international funding, leaving a gap of 76% unfunded [5]. The socio- economic effects of TB are enormous; since TB affects the economically more productive

age group of individuals[6]. Isah et al, in a work on TB patients in Ilorin, Nigeria, found that mild to moderate depression occur in about 27.7% of patients with TB and advocated that reduction of symptoms and improvement in financial status will improve the mood of patients with Tb[7].The disease has considerable impact on patients' house-holds: children's health, education and nutrition, particularly if the patient is the wage earner[6]. In some parts of the world, the stigma attached to TB leads to isolation, abandonment and divorce of women[8,9]. This will in turn affect the training and up-bringing of children. Thus, tuberculosis has the potential to impede development of both individual and society[10]. TB will rob world's poorest countries of an estimated 1-3 trillion dollars over the next 10years[1]. In some countries, loss of productivity attributable to TB approaches 7% of GDP[1].

This study evaluated the numerous problems which the post secondary student with TB encounters. This is important since the youth and otherwise the most productive age group is affected. At the onset of the illness, the student may not know the exact nature of the illness. Time and resources are wasted during the period the student goes around shopping for the correct diagnosis[5]. The duration of treatment is long; lasting for months. The psychology of swallowing pills is an enormous burden for the patient. Over-crowding is a well known factor in the spread of TB. Many higher institutions in the state have problem of accommodation with the result that many of their students are packed in one room[11]. Stigmatization has been recognized as a major barrier to care seeking in DOTS clinics and TB control in Nigeria [12]. A student with TB may not want to disclose his illness to his room-mates because of stigmatization and subsequent social isolation or possibility of being asked to quit the room. Eventually the room-mates may know that he has the disease and may isolate him. Once this happens, the student may go into depression resulting in poor performance and may eventually drop out from school.

Rationale of Study: This study was designed to assess the knowledge of TB transmission among students who were infected with TB and were on treatment. It takes a look at the influence of the disease on the over-all performance of the student and possible social effects on the patients and their guardian/sponsors. These social factors, if clearly identified can be addressed in order to give holistic care to the patient. This will improve patient's performance, prevent drop out from school, help to control the spread of infection and thus reduce the burden of TB in our environment.

STUDY OBJECTIVE

The aim of the study was to assess the knowledge of TB transmission among university and polytechnic students treated for TB and the social effects of TB on the students and their families.

METHOD

A structured questionnaire which had two parts was deigned to cover the clinical and demographic data of the subjects and also information obtained from sponsors/guardian. The questionnaire was pretested using six students with diagnosis of TB. The questionnaire was administered by the House Officers who served in the unit during the study period. The study is a cross-sectional descriptive study. Patients were recruited consecutively from students of tertiary institutions who were diagnosed with TB and are receiving treatment by directly observed therapy short-course (DOTS) at FMC Owerri, Imo State. Duration of treatment was for six months consisting of 2 months intensive and four months continuation phase using the four drugs – Rifampicin, Isoniazid, Ethambutol and Pyrazinamide at standard doses; and 4 months continuation phase using Rifampicin and Isoniazid. The study took place from August 2011–July 2013. Ethical approval was obtained from Ethics Committee of the FMC, Owerri.

Setting

The place of study included the Medical outpatient and the DOTS clinic of the Federal Medical Centre Owerri, in Imo state. The hospital is a tertiary health institution with 631 bed spaces including 44 bed spaces for TB patients; 22 for drug sensitive and 22 for drug resistant TB. Imo state has six tertiary institutions and patients are referred from the Medical Centres of these institutions and private hospitals to our DOTS facility. These institutions are located within and around Owerri municipal which is the capital of Imo State. Imo State has a population of about 4 million people. Federal Medical Centre Owerri serves a population of about 1.5 million people and its DOTS facility treats over 400 patients with tuberculosis annually.

Inclusion and Exclusion Criteria

All consenting adults ≥ 15 years of age who are in tertiary institutions and have been diagnosed with TB were included. Exclusion criteria were patients not in tertiary institution and unwillingness to participate.

Data Collection

A structured questionnaire was designed to cover demographic data and review symptoms of TB and document information obtained from parent/guardian. A consent form was signed by the subject once he gave consent to enroll. The questionnaire was tested initially on six patients who met the inclusion criteria and was found to yield the desired result. Sputum test for AFB, Chest x-ray, full blood count and erythrocyte sedimentation rate were conducted for all the patients. Appropriate specimens were taken from extra-pulmonary sites and sent for staining, cytology or for culture.

Additional investigations were done for patients with co-morbidities (co-existing illnesses). The patients were interviewed and information documented on awareness of mode of transmission. The social factors affecting the patients were reviewed with the aid of the first part of the questionnaire. The type of accommodation of the patients was evaluated and documentation on patients living conditions made. Patient's acceptance by his friends during the illness was also documented. While some patients told us that some of their friends have reduced their number of visits, a few said that some have completely stopped visiting them. Patients' sponsors or guardian were invited for discussion on individual basis during the time of the study. Information obtained was entered in the second part of the questionnaire. Issues of sponsors/guardians' incomes were clarified during the sessions. When we encounter difficulty getting the sponsor/guardian a visit was scheduled at a convenient place which was home, work place or any other business environment. The subjects' care givers were also interviewed and the degree of support assessed. At the end of treatment the outcome was documented.

Data Analysis

Data was analyzed using SPSS version 17.0. Descriptive statistics of demographic and clinical variables were calculated and presented as percentages; sample means, standard deviation, range, and chi square. In all, critical p value of < 0.05 was regarded as significant and conclusions were drawn based on this level of significance. Confidence interval was set at 95%.

RESULTS

A total of 415 patients with TB were treated during the study period. Sixty four were students from tertiary institution across the state. Fifty-eight finally completed the study. Two patents died while four were transferred out to other DOTS Centres (Table 1). Of the 58 subjects who completed the study, 28 (48.3%) were males and 30 (51.7%) were females; with M: F ratio of 1:1.07. The mean age was 25years.The maximum age was 44years while minimum age was 16 years. Five (8.6%) of the patients had TB/HIV co-infection while 53(91.4%) were HIV negative.

The study revealed that awareness on mode of transmission TB in undergraduates treated for disease during the period was 47(81%). It was found that 56(96%) had better awareness on mode of HIV transmission compared to knowledge of TB transmission 47(81%), and this is statistically significant (p value = 0.008). See Table 2.

Fig 1 showed the type of subjects accommodation; with 12(20.75%) of the subjects living alone in a room. Eighteen (31%) were living two-three in a room, while 28(48.3%) were living more than three persons in a room.

Table 3 showed the effect of TB on patents' career and other aspects of social life.

CAREER: The table showed that 10 (17.2%) of the subjects stopped school, 8(13.8%) lost greater than one semester and the career of 40 (69%) of the subjects were unaffected.

PEER GROUP: The table showed that 6.9% of the subjects were completely withdrawn from their friends. Twelve (20.7%) had the number of their friends reduced and more than 42(72%) retained their usual number of friends. (patients' perspective).

PARENTS/ GUARDIANS SUPPORT: The table showed that 44(75.4%) of the subjects enjoyed their parents/guardian support. There was no change in attitude of the parents/guardian in 11(18.9%); while in 3(5.2%) they were not supportive.

FINANCIAL SUPPORT: The table further showed in 6(10.3%), their financial support reduced while in 16(27.6%) their financial support increased. In 36(62%) of the subjects their financial support remained unaffected.

Table 4 showed that most of the subjects' parents/guardian had their monthly income greater than one hundred and eighty dollars per month. It further showed that 17(29.3%) of the parents/guardian had their income reduced during the period their subjects were sick; but this reduction is not statistically significant (p value = 0.997).

TABLE 1: DEMOGRAPHIC DATA

Age Range	Male (%)	Female (%)	HIV Status	
			Positive (%)	Negative (%)
15-19	3 (60.0)	2 (40.0)	1(25.0)	4 (75.0)
20 – 24	10 (62.5)	6 (37.5)	1 (6.3)	15 (93.7)
25 – 29	6 (31.6)	13 (68.4)	2 (10.5)	17 (89.5)
30-34	4 (50.0)	4 (50.0)	0 (0.0)	8 (100.0)
35-39	2 (40.0)	3 (60.0)	0 (0.0)	5 (100.0)
>40	3 (60.0)	2 (40.0)	1 (25.0)	4 (75.0)
TOTAL	28 (48.3)	30 (51.7)	5 (8.6)	53 (91.4)

Average Age -25 years, Range = 28 years (16 – 44years).

TABLE 2: AWARENESS ON MODE OF TRANSMISSION OF HIV vs TB

KNOWS MODE OF TRANSMISSION No (%)		YES	NO
HIV	58(100)	56 (96.6)	2(3.4)
TB	58 (100)	47(81.0)	11(19.0)

χ^2 = 7.02. P value = 0.008 (Significant)

TABLE 3: EFFECT OF TUBERCULOSIS ON STUDENTS' ACADEMIC PROGRESSION

Career	Stopped school	Lost one or > semester	Did not affect school
No.(%)	10(17.2)	8(13.8)	40(69.0)
Peer group	Complete withdrawal from friends	Reduced no. of friends	Did not affect no. of friends
	4(6.9)	12(20.7)	42(72.4)
Parents	Not supportive	supportive	No Change in attitude
No.(%)	3(5.2)	44(75.9)	11(18.9)
Financial support	Reduced	Increased	Did not affect it
No. (%)	6(10.3)	16(27.6)	36(62.1)

TABLE 4: EFFECT OF TB ON PARENT/GUARDIAN ESTIMATED MONTHLY INCOME.

Monthly Income ($)	No (%)	Reduced Income	Income not Affected
<50	6 (10.3)	2 (3.4)	4 (6.9)
50-89	6 (10.3)	1 (1.7)	5 (8.6)
90-119	8 (13.8)	3 (5.2)	5 (8.6)
120-179	12 (20.8)	4 (6.9)	8(13.8)
=180	26 (44.8)	7 (12.1)	19(32.8)
TOTAL	58 (100)	17(29.3)	41(70.7)

χ^2 = 0.158; p value =0.997 (not significant).

DISCUSSION

Tuberculosis is common in our environment and affects children and adults of all ages, but is more common in the productive age group; the educated and the uneducated. The socioeconomic effects cut across all age groups but its greatest effect is on the economically productive adults [6]. These adults/adolescents who are in the tertiary institution are part of this age group on whom the future development of the country depend. TB therefore has the potential to impede the development of the individual and the society [9]. TB affects both males and females equally, with slight male preponderance. The data here supports an already established finding. The reason for more females recorded in present study may be due to more females in the tertiary schools in the south eastern states of Nigeria. The most affected age groups were those between 25 to 29 years with 32.8% of them in the population studied.

The study also showed that HIV/AIDS was found in only 5(8.6%) of the total population studied. It is estimated that about one third of the patients with TB will also have HIV infection [1]. The reason for this lower proportion of co infection could not be readily explained but may be due to wider publicity given to HIV infection on the mode of transmission and prevention. In our study, we found that awareness on the mode of transmission of HIV infection was 96.6% while that of TB was 81%. This figure may even be lower in the uneducated

and in people with lower educational standards and calls for a renewed strategy and commitment for increased awareness on the mode of spread and prevention of TB and other common communicable diseases.

A good number of our subjects were living more than three in a room while few were living alone. This is not peculiar to the tertiary institution in Imo state alone but reflects the pattern across the country with most undergraduates living in overcrowded environment which is not conducive for sustained good health and learning. This finding supports the observation made by Fatunde et al[11] that there has been steady growth in students population in the tertiary institutions, most of which has been expanding their teaching, administrative and research infrastructures. But no effort has been made to provide more accommodation for students and staff. Sometimes the rooms are small and poorly ventilated and we know the role of overcrowding on the spread of TB. This goes a long way to challenge the campaign against the 'stop End programe' which is being preached across the world. A number of our subjects had their career affected or completely truncated by the disease. More than 17% of the subjects stopped their educational career as a result of the disease while greater than 13% lost one semester or more.

There is need for urgent intervention because the trend will endanger the future of some of our youths if allowed to continue unchecked. This is imperative at this time our nation is trying to reposition the educational system and is advocating for mass literacy of its citizens.

Discussions and findings among the patients showed that about 6.9% of our patients were completely withdrawn from their friends while many more of them had the number of their friends reduced as a result of the illness. This withdrawal attitude and reduction in number of friends is due to stigmatization and social isolation of the affected students and this forms a barrier to care seeking in DOTS facilities and militates against TB control; an observation made by a study in Southern Nigeria [12].

Quite a good number of our subjects had good support from their parents/guardian. This could be explained by our society and culture which advocates support and care for the sick to enable them recover fast and continue to assume their social responsibility. In the same manner the financial support of some of our patients improved during the period of their illness. However, the study noted reduction in the financial support of few of our subjects and attributed it to the reduction in income of their parents/guardian. Most of the parents/guardian attributed the financial loss to time wasted in finding the correct diagnosis, self medications and in the hands of quacks and untrained personnel; an observation which had already been made by a study group in India [9].

Conclusion and Recommendations: Tuberculosis poses an enormous burden on the students in tertiary institutions in Imo state with a significant number of them stopping their education or having it unnecessarily prolonged. A holistic care of patients in this category should be ensured to ensure their education is not affected by this illness. We also add that more awareness needs to be created on the mode of transmission of TB to enable us check further spread.

Our recommendations are: That more education should be geared towards a better knowledge of transmission and prevention of TB and other infectious diseases in our schools.

That better accommodation should be provided for the students in the tertiary institutions in the state and in the country at large to reduce overcrowding and control spread of TB infection.

That financial assistance should be given to this group of students to ensure that their career is not truncated due to the illness.

FUNDING: NONE

ETHICAL APPROVAL: Obtained from the Ethical Committee of the Federal Medical Centre Owerri, Imo State.

AUTHOR'S CONTRIBUTION: The five authors were involved in the design of the study protocol.

AKNOWLEDGEMENT: We wish to acknowledge the house officers who served in the unit during the study period who helped us in administering the questionnaires and follow-up of patients.

GCM, EOO, FON, COUE and INM drafted and wrote the manuscript

All authors read and approved the final manuscript.

GCM is the guarantor of the paper.

CONFLICT OF INTEREST: No conflict of interest.

REFERENCES

1. World Health Organization (WHO) Global TB Control Report. November 2010.
2. 2011 Global Alliance for TB Drug Development.
3. National Tuberculosis and Leprosy Control Programme (NTBLCP). 2010; Worker's Manual Revised 5th Edition.
4. World Health Organization (WHO) Global TB Control Report. 2014
5. World Health Organization (WHO) Global TB Control Report. 2018.
6. Geetharamani S Muniyandi M, Rajaswari R et al. Socio–economic impact of Tuberculosis on children. Indian Journal of Tuberculosis. 2001; (48) 91-94.
7. Isah B A, Yussuf A D, Kuranga S I. Depression co-morbidity among patients with TB in a University Teaching Hospital clinic in Nigeria. Mental Health in Family Medicine 2009; 6(3):133-138.
8. Stevens M. Tuberculosis- women's health issue. Nursing update. 2009; 30-34.
9. TB advocacy, A Practical Guide 1999, WHO Global TB Programe.
10. Connolly M, Nunn p. World Health Starts Quest. 1996: p 5.
11. Fatunde T. Nigeria: Private hostels rip off university students. University World News 2010; 53.
12. Okeibunor J C, Onyeneho N G, Chukwu J N, Post E. Barrier to Care Seeking in DOTS Clinics and TB Control in Southern Nigeria. A Qualitative and Analysis. International Quarterly of Commnity Health Education Issue. 2006-2007; 27 (1) : 23-27.