



**STUDIES ON THE INFECTION OF TUBERCULOSIS AND HUMAN
IMMUNODEFICIENCY VIRUS (HIV) AMONGST PATIENTS ATTENDING
MGBUNDUKU CHEST CLINIC IN DIOBU PORT HARCOURT, RIVERS STATE.**

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ABSTRACT

The research was conducted to examine the rate of co-infection of Tuberculosis (TB) and Human Immunodeficiency Virus (HIV) amongst patients attending Mgbunduka Chest Clinic in Diobu, Port Harcourt, Rivers State. A total of 800 sputum and blood samples were collected from patients in the clinic. Sputum was examined by microscope which is the gold standard while HIV test was carried out using Determine test Assay technique and stat-pak Assay technique. The positive cases for Tuberculosis were 160 (20%) made of 85(10.63%) males and 75 (9.3%) females. The positive cases for HIV were 254 (31.75%) of which 138(13.88%) were males and 143 (17.8%) were females. The number of Co-infected cases were 37(4.63%) of which 16(2.0%) were males and 21(2.63%) were females. The age interval examined were between 5-74. The least infected age group were between 65-74years. Out of total of 35(4.3%), 1(0/13%), 8(12) and 0 were infected for Tuberculosis HIV and Co-infection cases. The most populated group of 25-34 with a total of 299 (37.38%) subjects of which were 55 (6.87%), 94 (11.75%) and 20 (2.50%) were infected for Tuberculosis HIV and co-infection subjects. Statistically, there was significant rate of co-infection cases ($P < 0.05$) and no significant relationship between TB and HIV cases ($P > 0.05$) in both sex and age interval. This study has shown that a more serious attention should be given to TB/HIV co-infection rates through increase awareness, counseling and treatment.

KEYWORDS: Co-infection, Human Immunodeficiency Virus, Tuberculosis, Lymphadenopathy, Heterosexual.

INTRODUCTION

Tuberculosis is a respiratory disease of the lower respiratory tract which is caused by inhaling cough particles or droplets containing tubercle bacilli. It is caused by *Mycobacterium tuberculosis* which is an aerobic non-spore forming and rod shaped bacillus (Koch, 1991). They do not stain readily and when stained resist decolorization by acid or alcohol and hence the name acid-fast bacilli (Jawetz *et al.*, 2000). Tuberculosis had been subdued over the years but had recently shockingly re-emerged resulting in the death of millions. Tuberculosis poses a worldwide problem resulting in 3 million deaths annually.

Africa also has its share resulting in about 19.5% of deaths annually (Glynn *et al.*, 2004). Between 1985-1992 tuberculosis cases increased by 20%. As at this time Nigeria had a peak of 362, 819 being fourth behind India with 1, 788,043 cases, China with 1,334,066 cases and Indonesia with 627,044 cases (Raviglione, 1996). In Nigeria almost all states have reported cases of

Tuberculosis some of which include Imo, Kano, Edo and Rivers State. Rivers State has records from its Local Government areas of Tuberculosis cases increasing annually by more than 100% for 5 consecutive years (Nwidi *et al.*, 2007).

Tuberculosis has a serious challenge by long duration in treatment about (6-9 months) which has led to many declining commitment to treatment (Jawetz *et al.*, 2004).

Tuberculosis combines perfectly with HIV infected persons. Human Immune Deficiency Virus (HIV) type I and 2 are derived from Primate lentiviruses, which are etiologic agents of AIDS. The infection was first described in 1981 and HIV was isolated by the end of 1983, since then AIDS has become a worldwide epidemic expanding in scope and horizon. It has affected different populations and geographical regions. HIV attacks and suppresses the amount of CD4 T-Cells in the body. CD4 T-Cells are responsible for conferring cell-mediated immunity to individuals; the continuous

supersession of CD4 T-cell count by the virus exposes one to infectious hazard of which tuberculosis is foremost.

The Co-infection of Tuberculosis and HIV are responsible for Tuberculosis resurgence. The World Health Organization reported that Tuberculosis is the number one opportunistic infection causing 40% of all AIDS related deaths and that people living with HIV have a 50% probability of developing Tuberculosis annually. (Cheesbrough, 2000).

In HIV related Tuberculosis with Immune suppression, it is common to find spreading pulmonary lesions without gross cavitation, non-pulmonary forms of the disease such as multi-organ involvement and non-symmetrical lymphadenopathy. Symptoms include chronic cough with production of mucopurulent or purulent sputum which may contain blood, weight loss, fever, night sweats, fatigue, chest pains and anemia (Cheesbrough, 2000).

The co-infection has created breaches within individuals by bringing about stigmatization of infected persons and it has ultimately increased death rate. However most developing countries such as Nigeria still have serious challenges in coping with this ugly infection duo. This is why Africa is estimated to require N1.5 trillion between 2006 – 2007 to boost the fight against HIV related Tuberculosis (Nwido *et al.*, 2008). HIV is present in semen, vaginal/Cervical secretions and blood and these are the main vehicles by which the virus is transmitted. The virus may also be present in saliva, tears, Urine, breast milk, CSF and infected discharges. It is transmitted by Heterosexual/Homosexual sexual intercourse, mother to child, infected blood transfusion or blood products, use of contaminated needles and syringes whereas tuberculosis also occurs when a susceptible person inhales droplet nuclei containing tubercle bacilli which become established in the alveoli of the lungs and spread throughout the body (Center for Disease Control, 1995). Mantoux Tubercule skin test is preferred method of skin testing of TB in which intradermal injection of purified protein derivative (PPD) of killed Tubercule bacilli is done on the forearm. The site is examined within 48 to 72 hours after injection by a trained health worker for indurations and its diameter measured.

All persons with tuberculosis infection or Tuberculosis disease should be offered counseling and HIV antibody test. A high index suspicion for Tuberculosis in persons with undiagnosed pulmonary disease is noted especially in HIV persons (Ball and Barnes, 1994).

This study was carried out to ascertain the various ratios of Tuberculosis, HIV and co-infection cases to know the extent of its impact in port Harcourt and also to ascertain the age group that are mostly infected with the co-infection.

MATERIALS AND METHODS

Study Area

The research was carried out in the heart of Port Harcourt. Port Harcourt is a multilingual city with a population of over 5 million. It is a commercial city with different ethnic groups which include, Civil Servants, Farmers, Fishermen, Traders, Oil and Gas workers and expatriates from other states and countries.

Study Site

The study was carried out in Mgbunduku Chest Clinic/Health Centre which is located in Diobu area of Port Harcourt.

Collection of samples

A total of 800 samples of sputum and blood was collected from patients attending the clinic.

Sputum was collected after the patient make a deep cough into a specialized sputum container as advised.

Vein-blood puncture was also used by inserting a standard syringe into the vein of the subject. The desired quantity was then withdrawn and separated for analysis.

Analysis

Microscopic examination of sputum

The purulent or blood stained area of the sputum was smeared on a grease free slide and allowed to air dry. The smear was held with a forceps and passed 2-3 times for 2-3 second on a flame to fix.

The slide that contains the smear was placed on a staining rack and carbon fuchsin stain was added to cover the entire surface of the slide.

The slide was then heated until steam rinsed but not allowed to boil. The smear was kept hot for 5 minutes. It was rinsed with water 3% hydrochloride acid solution was used to decolorized the smear and then rinsed with water methylene blue was added as a counter stain and rinsed in water. The back of the slide was cleaned and they slide kept to air dry.

A drop of oil immersion oil was placed on the smear and examined using x100 objective lens. A pink coloured tubercle bacilli indicates a positive result.

Detection of HIV using determine assay technique

About 50 microlitre of serum or plasma was pipetted into the sample pad at the point marked by arrow symbol and allowed to stand for it minutes before it was read red bars in both control window and patient window indicate a positive result while a red bar 15 the control window alone indicate negative result.

Detection of HIV using stat-pak Assay techniques.

A drop of the serum was put into the test hole on the cassette. 3 drops of running buffer was then added to the sample and the result read after 10 minutes in a well-lit area of the laboratory. The positive result is indicated by 2 precipitated lines as control is indicated by one precipitated line.

RESULT

They were 800 subjects for this study, out of which 160 (20%) were positive for Tuberculosis, 254 (31.7%) for HIV and 37 (4.63%) were for positive for co-infection with Tuberculosis and HIV also the number of males infected with Tuberculosis, HIV and TB/HIV were 85(10.63%) and 16(2.0%) respectively. The female infected with tuberculosis, HIV, TB/HIV were

75(9.37%), 143 (17.87%) and 21(2.63%) respectively. All these are as shown in figure 1.

In the age distribution the least prevalence rate was noticed in age bracket 65-74years in TB, HIV and TB/HIV showing 1(0.13%) 8 (1%) and 0 respectively, while the age bracket of 25-34 years in TB, HIV and TB/HIV showing 55(6.87%), 94(11.75%) and 20(2.50%) respectively as shown in table 1.

Table 1: Age distribution of Tuberculosis, HIV and co-infection (TB/HIV)

Age groups (years)	TB (%)	HIV (%)	TB/HIV (%)	Negative (%)	Total (%)
5-14	9.0 (1.13)	8 (1.0)	--	21.0 (2.62)	38 (475)
15-24	40 (5.0)	25 (3.13)	3.0 (0.37)	67 (8.37)	135 (16.87)
25-34	55 (6.9)	94 (11.95)	20 (2.5)	130 (16.26)	299 (37.38)
35-44	190 (2.4)	60 (7.5)	8 (1.0)	46 (5.75)	133 (16.63)
45-54	19 (2.4)	39 (4.87)	4 (0.5)	31 (3.88)	93 (11.62)
55-64	17 (2.1)	20 (2.5)	2 0.25	28 (3.51)	67 (63)
64-74	1 (0.1)	8 (1.0)	--	26 (3.24)	35 (4.37)
Total	160 (20)	254 (31.75)	37 (4.62)	349 (43.63)	800 (100)

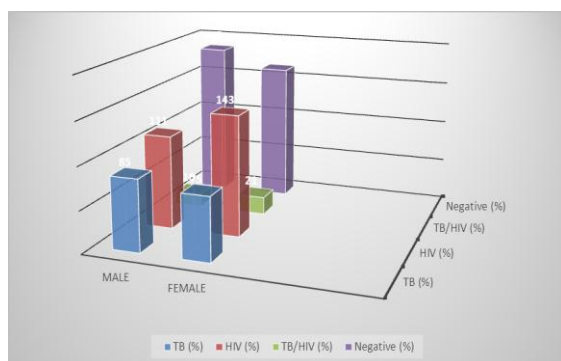


Figure 1: Number of male and female patients with Tuberculosis, HIV and Co-Infection

DISCUSSION

This study was aimed at evaluating and providing information concerning the resurgence of Tuberculosis among persons living with HIV in Nigerian Population, especially in Port Harcourt. In course of the study out 800 subjects screened, a total of 160 (20%) were positive for TB, 254(31.75%) for HIV and 37(4.63%) were co-infected. This finding however agrees with that of Yusurph (2005) in Nguru North Eastern Nigeria.

The study shows fairly high incidence of tuberculosis in males (10.03%) than in females (9.37%). This is as a result of the adventurous lives of males since they are usually involved in making contacts and communication with individuals. Also males are involved in close contact activities such as truck pushing, driving and conducting buses, watching, playing/discussing sports on newspaper stands, controlling traffic than females. (Elegbe, 1986).

The number of co-infection is higher in females than males because of sexual relation with many males of which the contributory factors in females are as result of their body anatomy and physiology, economic

circumstance which leads most females into prostitution and unprepared sex; early marriages and genital manipulation due to circumcisions.

The age bracket of 25-35 years has the highest prevalent rate but generally most subjects with notable cases of infection were between 15-54 years. The reasons amongst this age bracket could be as a result of this group being sexually active as they could easily experiment with sex without protection. The females in this group are also of child bearing age and could be infected as result of the instruments used during child delivery. The age bracket of 65 – 74 are usually not highly infected because they are no longer active in sex. To avoid these infections some level of awareness, consciousness and self discipline should be maintained in our daily lives.

CONCLUSION

This study has shown that if collaborative efforts are not taken, Tuberculosis and HIV could become the major source of mass mortality in persons living in Port Harcourt. This also shows that active youths are in severe danger and the society could be crippling and if not adequately controlled. There will be gross economic decay in the city as various sectors of the economy such as Agriculture Bawdry, Oil and Gas, Transport, Education would be infected.

There is also a serious indication that despite the fact that there has been some awareness to the public about the resurgence of Tuberculosis in HIV infected persons. Many especially the aged ones and the parents are still ignorant about the disease leading to a few funning out for diagnostic test. Easily detections can therefore aid in the prevention and minimize the spread of TB and HIV 15 health care selling. The isolation and treatment of disease in persons with infections TB is essential. Government should also try to encourage advocacy and

setting up of health facilities to argument the efforts of private individuals.

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