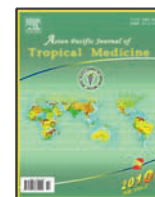


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HIV/AIDS related mortality among adult medical patients in a tertiary health institution in South–South, Nigeria

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ABSTRACT

Objective: To determine the causes of death among human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) patients as a step to planning strategies to improve mortality from this condition. **Methods:** This study retrospectively analyzed the mortality pattern of adult HIV/AIDS patients in the University of Calabar Teaching Hospital from January 2005 to December 2007. The data were obtained from sexually transmitted infection/acquired immunodeficiency syndrome (STI/AIDS) clinic register, admissions and discharge/death registers as well as the patients' case records and the hospitals monthly mortality reviews. Information obtained included age, sex, diagnosis and cause(s) of death. The causes of death considered were the direct causes of death, since the originating antecedent cause of death is the same in all the patients, in this case, HIV/AIDS. Data was analysed using Epi Info 2002. **Results:** The total number of mortalities during the study period was 350, 100 were HIV positive representing 28.6% of all deaths. While advanced HIV/AIDS disease was the leading cause of death in our study representing 27.0%, tuberculosis was the single leading cause of deaths in HIV/AIDS patients constituting about 24.0% of deaths. This was followed by sepsis and septicaemia (13.0%), meningitis and encephalitis, and anaemia accounting for 11.0%, while respiratory diseases constituted 5.0% of the mortality burden. The highest number of deaths occurred in those aged between 21–50 years (82.0%). **Conclusions:** The study has shown that HIV/AIDS is a major cause of morbidity and mortality in our hospital. The causes of death reflect the varied spectrum of infection and other forms of organ involvement that affect HIV/AIDS patients. The present dismal situation of adult patients living with HIV/AIDS calls for enhanced strategies to decrease the mortality trend observed in Nigeria and sub-Saharan Africa.

1. Introduction

It is almost 30 years since the initial recognition of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) in the United States of America[1]. This disease has since exploded into the largest pandemic of our time. The disease has caused a lot of human suffering and has affected all cultures, demographic indices, economies and politics across the globe. The pandemic has continued to spread and consolidate its hold on the

world population especially in sub-Saharan Africa, leading to poverty with associated poor nutrition and increased mortality[2].

Africa continues to groan under the burden of HIV/AIDS with 70% of adults and 80% of children living with the disease[3]. About 75% of those who have died from the disease since the epidemic began have been from Africa[3]. The AIDS situation in sub-Saharan Africa is worse as more people die from the disease than from wars with adult prevalence of 8%[4]. The adult prevalence in Nigeria, the most populous sub-Saharan African country, was 4.4% by the end of 2005[5].

While viral load and degree of immunosuppression is known to affect the pattern of presentation, AIDS presentation and mortality vary from region to region[3,6].

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The introduction of Highly Active Antiretroviral Therapy (HAART) in Nigeria has led to a substantial decrease in mortality among HIV/AIDS infected people with access to HAART^[6]. However, the effect on the general health-seeking public in developing countries like Nigeria is still limited as HAART is yet to become widely available because of cost and lack of clinical infrastructure^[7]. Based on the 2005 HIV Sero-prevalence Sentinel Survey only 50 000 of the estimated 412 450 adult people living with AIDS (PLWHA) requiring antiretroviral therapy in Nigeria have access to antiretroviral drugs^[5].

There have been several studies in Nigeria in which the dominant contributory role of HIV/AIDS to adult mortality has been highlighted. However, few of these studies have attempted to specifically address the specific causes of mortality in Nigerians adults with HIV/AIDS. This study therefore is to determine the causes of death among HIV/AIDS patients as a step to planning strategies to reduce mortality from this condition.

2. Materials and methods

This study was a three-year retrospective study of the mortality pattern of adult AIDS patients in the University of Calabar Teaching Hospital from January 2005 to December 2007. The data were obtained from sexually transmitted infection/acquired immunodeficiency syndrome (STI/AIDS) clinic register, admissions and discharge/death registers as well as the patients' case records and the hospitals monthly mortality reviews. Ethical approval was received from the Hospital's Ethical Committee.

The University of Calabar Teaching Hospital is a tertiary health institution in the South-South geopolitical zone of Nigeria and has a free adult Antiretroviral (ARV) drugs programme under the President's Emergency Plan for AIDS Relief (PEPFAR) supported by the Institute of Human Virology Nigeria (IHVN). It therefore serves as a major referral health center for HIV/AIDS patients in south-south Nigeria. The medical wards of the Teaching Hospital receive patients from the STI/AIDS (PEPFAR) clinic and the medical outpatient clinic (MOPC). Patients are also received into the hospital, and subsequently the medical wards from self referrals, referrals from private and government hospitals and also primary health care centres within the catchment area of the Teaching Hospital.

The patients considered were those with a diagnosis of HIV/AIDS. The diagnosis was made when there was evidence of AIDS defining opportunistic infection or malignancy, positive enzyme-linked immunosorbent assay (ELISA) antibody test and confirmation by Western blot (or double-positive ELISA when Western blot was not available), and existence of two or more major and one minor AIDS defining criteria in the absence of known cause of immunosuppression^[8]. Information obtained included age, sex, diagnosis and cause(s) of death. The causes of death considered were the direct causes of death, since the originating antecedent cause of death (defined as the "disease or injury that initiated the train of morbid events

leading directly to death or the circumstance or the accident or violence that produce the fatal injury"^[9]) is the same in all the patients, in this case, HIV/AIDS.

The cause of death was determined purely on clinical grounds as there is cultural resistance to autopsy by patients' relative making it difficult to clarify primary and contributory causes of death.

Data was analysed using Epi Info 2002.

3. Results

The total number of admissions during the study period was 2 485, with a total of 350 deaths out of which 100 were HIV related representing 28.6% of all deaths. There were 39 males and 61 females with a male : female ratio of 1 : 1.6. Their ages ranged between 20–70 years with a mean age of 35.4 years.

Table 1

Age and sex distribution of HIV/AIDS related deaths in UCTH, Calabar.

Age (yrs)	Male	Female	Total/Percentage
11–20	2	1	3
21–30	12	25	37
31–40	14	17	31
41–50	4	10	14
51–60	2	3	5
61–70	0	2	2
Not Stated	5	3	8
Total	39	61	100

The highest number of deaths occurred in those aged between 21–50 years (82.0%). This was made up of 30 males and 52 females. The ages of eight patients were not stated (Table 1).

Advanced HIV/AIDS disease was the leading cause of death in our study representing 27.0%, and tuberculosis was the single leading cause of deaths in HIV/AIDS patients constituting about 24.0% of deaths. This was followed by sepsis and septicaemia (13.0%), meningitis and encephalitis, and anaemia accounting for 11.0% each, while respiratory diseases constituted 5.0% of the mortality burden. Hepatitis (2.0%), gastrointestinal diseases (3.0%), renal failure (3%) and intracranial space occupying lesions (1.0%) made up the remaining 9.0% of the HIV/AIDS mortality burden.

4. Discussion

The fact that HIV/AIDS continues to adversely affect mortality rates in sub-Saharan Africa, including Nigeria, has been established in several studies^[3,6,10,11]. Our study showed HIV/AIDS alone was found to be the commonest

cause of mortality accounting for 28.6% of overall mortality. Other similar studies found 13.6% in Kano in North Western Nigeria^[9] and 49% in Blantyre Malawi^[11]. This continues to be the picture seen in most parts of sub-Saharan Africa where the supply of much needed HAART is often inadequate and inaccessible to those in need especially those living in remote areas of the country^[6]. It has also been documented that HIV-infected persons in Africa typically show more rapid progression than infected persons from other regions of the world^[12–14]. In the developed countries, it has been found that the availability of potent HAART has significantly improved survival^[12]. There is therefore the urgent need to improve on the availability, accessibility and sustainability of HAART supply and treatment.

Majority of deaths occurred among those aged from 21–50 years. These accounted for 82.0% of all AIDS related mortalities. This finding is similar to those found in Kano, Kano state of Nigeria where most of the mortalities were in those aged 21–50 years, while in that study, the peak incidence of 38.2% of AIDS mortality was recorded in the 31–40 year age group^[6]. This age bracket constitutes the economically productive segment of the society. Therefore, increasing mortality has adverse implications on the national productivity and development^[15,16].

Mortality rate was generally higher in female (61.0%) overall compared to males (39.0%). It was also found that women died at younger age than men. This is similar to finding in Kano, Nigeria^[6]. This finding may be due to the fact that women are more prone to HIV/AIDS infection by their very biological makeup and also due to socio-cultural factors which make for greater risk of infection among the females.

In our study, while advanced AIDS cause most of the mortalities, tuberculosis is the single commonest underlying cause of death, accounting for 24.0% of deaths. This finding is less than that found in Kano (33.4%)^[5] and that found in Lagos (34%)^[3] of all HIV/AIDS related deaths. This may be due to lower rate of presentation to hospital and the absence of autopsy diagnosis due to cultural resistance, therefore making definitive diagnosis difficult.

About 27.0% of deaths in the study was due to advanced AIDS which is the end of the spectrum, during which time tuberculosis is known to be a major opportunistic disease that can drastically alter the course of the disease^[17]. The situation is worse in Africa as it has been noted that even in the presence of HAART and anti tuberculosis medications, the rate of treatment failure is much higher and fear of HIV diagnosis may delay utilization of health services^[6]. It is necessary that effort in the treatment and control of tuberculosis in HIV/AIDS patients should be intensified.

Anaemia accounted for 11.0% of the mortalities. This compares with findings in Lagos which found that 19% of mortalities were due to anaemia^[3]. This findings are because anaemia is a known independent risk factor for death among HIV/AIDS patients and as much as 59% of those who suffer from anaemia are likely to die even if other opportunistic infections are treated appropriately^[17]. Another study among HIV-positive women in Tanzania also agreed that anaemia in this group of patients was independently

associated with death irrespective of CD4 cell count with the risk of death found to be increased by 30% for every 1g/dL decrease on haemoglobin^[18]. The aetiology of anaemia in HIV patients is known to be multifactorial with mechanisms like malnutrition, decreased haematopoietic cell production, decreased capacity of the haematopoietic stroma to respond to increased demand and impaired erythropoietin response feedback due to excess inflammatory cytokines^[19]. Also conventional treatments for anaemia do not seem to reverse the grave prognosis of anaemia among HIV patients^[17]. It is also known that in less developed countries, particularly in sub-Saharan Africa, confounding factors like poor nutrition and worm infestation worsen the anaemia^[17,19].

Central nervous system infections accounted for 11.0% of deaths. These were mostly from meningitis or encephalitis. This is similar to findings in Lagos which found a mortality of 10% due to meningitis/encephalitis^[3] and slightly higher than the findings in Kano of 7.3%^[6]. These infections arise from direct or indirect effects of the virus, opportunistic infectious agents, and complications of treatment or neoplasms. Early treatment, probably prophylactic antibiotics, targeted at HIV/AIDS patients based on certain criteria with risk categorization in mind may be useful in reducing this burden.

Septicaemia and sepsis accounted for 13.0% of the mortalities in this study. This is lower than findings in Kano which was 23.7%^[6], while in Lagos it was 22%^[3]. Septicaemia is one of the most serious AIDS-related complications in clinical practice which is associated with high mortality even in developed countries^[20,21]. The wide difference in AIDS mortality from septicaemia in our study compared to elsewhere in Nigeria may be due to our comparatively lower number of cases.

Unfortunately, the diagnosis of causes of death in all cases was based on clinical and laboratory data because autopsy was not performed in any of the cases. This was due mainly to cultural and religious resistance to autopsy and the need to curtail further medical expenses in preparation for the burial of the deceased which is also quite expensive in this part of Nigeria. This scenario was also found in studies in other centres in the country^[6,15,22–24]. This makes the clinical diagnosis inconclusive. Several other patients are lost to traditional healers, churches, spiritual healing homes therefore making these figures even less representative of the true picture of mortalities in the communities^[6,25,26].

A worrisome finding in this study was poor entry of patient's biodata especially age in 8% of subjects. This can affect mortality distribution among the ages which would consequently affect audit outcomes and intervention measures.

This study has shown that HIV/AIDS is a major cause of morbidity and mortality in our hospital. The causes of death reflect the varied spectrum of infection and other forms of organ involvement that affect HIV/AIDS patients. The present dismal situation of adult patients living with HIV/AIDS calls for enhanced strategies to decrease the mortality trend observed in Nigeria and sub-Saharan Africa. This requires sustainable efforts by the federal, state and local governments as well as Non-government-

organizations (NGOs) to prevent further infections through effective interventions. By improving the quality of available care through provision of curative treatment of commonly associated conditions, prophylaxis of opportunistic infections, antiretroviral drugs and improved access, it is hoped that infected individuals can live longer. With the introduction of affordable HAART in several centres, assistance from foreign donors and government, it is hoped that mortality picture for this group of individuals will improve.

Conflict of interest statement

We declare that we have no conflict of interest.

References

- [1]Centres for Disease Control and Prevention. Kaposi's sarcoma and Pneumocystis pneumonia among homosexual men—New York City and California. *MMWR* 1981; **30**: 305.
- [2]Ezeokana JO, Nnedum OAU, Madu SN. Pervasiveness of poverty among people living with HIV/AIDS in South Eastern Nigeria. *J Hum Ecol* 2009; **25**(3): 147–59.
- [3]Ekong EE, Akinlade O, Uwah A, Grant–Isibor I, Igbu T. *Trend and spectrum of mortality among HIV patients in the era of HAART—the Nigerian experience*. International Conference on AIDS. 2002 July 7–12;14:abstract no MoPeC3328.
- [4]Thomas JO. Acquired immunodeficiency syndrome–associated cancers in sub–Saharan Africa. *Semin Oncol* 2001; **28**: 198–206.
- [5]Federal Ministry of Health, Abuja. Department of Public Health, National AIDS/STDs Control Programme (NASCP). *2005 National Sero–prevalence sentinel survey*. Process and Findings.
- [6]Sani MU, Mohammed AZ, Adamu B, Yusuf MS, Samaila AA, Borodo MM. AIDS mortality in a tertiary health institution: A four–year review. *J Nat Med Ass* 2006; **98**(6): 862–6.
- [7]UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance. *UNAIDS 2004 report on global HIV/AIDS epidemic*. Joint United Nations Programme on HIV/AIDS. Geneva: UNAIDS; 2004.
- [8]Espinoza L, Hall HI, Hardnett F, Selik RM, Ling Q, Lee LM. Characteristics of persons with heterosexually acquired HIV infection, United States 1999–2004. *American J Public Health* 2007; **97**(1): 144–9.
- [9]World Health Organization. *Manual of international statistical classification of diseases (ICD 10), injuries and causes of death: revision 1992*. Geneva: World Health Organization; 1992.
- [10]Bane A, Yohannes AG, Fekade D. Morbidity and mortality of adult patients with HIV/AIDS at Tikur Anbessa Teaching Hospital, Addis Ababa, Ethiopia. *Ethiop Med J* 2003; **41**(2): 131–40.
- [11]Harries AD, Mvula B. The changing pattern of mortality in an African medical ward. *Trop Geogr Med* 1995; **47**(4): 171–4.
- [12]Boerma JT, Nunn AJ, Whitworth JG. Mortality impact of AIDS epidemic: evidence from community studies in less developed countries. *AIDS* 1998; **12**(Suppl): S3–14.
- [13]Leroy V, Msellati P, Lepage P, Batungwanayo J, Hitimana D, Taelman H, et al. Four years of natural history of HIV–1 infection in African women: a prospective cohort study in Kigali (Rwanda), 1988–1993. *J Acquir Immune Defic Syndr* 1995; **9**: 415–21.
- [14]Morgan D, Maude GH, Malamba SS, Okongo MJ, Wagner H, Mulder DW, et al. HIV–1 disease progression and AIDS–defining disorders in rural Uganda. *Lancet* 1997; **350**: 245–50.
- [15]Seagroatt V, Goldacre MJ. Hospital mortality league tables: Influences of place of death. *BMJ* 2004; **328**: 1235.
- [16]Ogun SA, Adelowo OO, Familoni OB, Jaiyesimi AE, Fakoya EA. Pattern and outcome of medical admission at the Ogun State University Teaching Hospital, Sagamu—A three year review. *West Afr J Med* 2000; **19** (4): 304–8.
- [17]Jamieson C. *The investigation of the effects of anaemia on the outcome of patients with stage 4 AIDS*. Fourth South African AIDS Conference in Durban, South Africa, abstract 408, 2009.
- [18]O'Brien ME, Msamanga GI, Saathoff E, Hunter D, Fawzi WW. Anaemia and mortality among HIV–positive women in Tanzania. *Int Conf AIDS* 2004;15:abstract no. MoPeC3401.
- [19]Mlisana K, Auld SC, Grobler A, van Loggerenberg F, Williamson C, Iriogbe I, et al. Anaemia in acute HIV–1 subtype C infection. 2008; PLoS ONE 3(2):e1626.doi:10.1371/journal.pone.0001626.
- [20]Lewden C, Salmon D, Morlat P, Bevilacqua S, Jouglu E, Bonnet F, et al. Causes of death among human immunodeficiency virus (HIV)–infected adults in the era of potent antiretroviral therapy: emerging role of hepatitis and cancers, persistent role of AIDS. *Int J Epidemiol* 2005; **34**: 121–30.
- [21]Chu SY, Buehler HW, Lieb L, Beckett G, Conti L, Costa S, et al. Causes of death among persons reported with AIDS. *Am J Public Health* 1993; **83**: 1429–32.
- [22]Erhabor GE, Adewole OO, Ogunlade OO. A five–year review of tuberculosis mortality amongst hospitalised patients in Ile–Ife. *Indian J Chest Dis & Allied Sci* 2006; **48**: 253–56.
- [23]Mckee M, Coles J. 'Failure to Rescue' as a measure of quality of hospital care: The limitation of secondary diagnosis coding in English hospital data. *J Publ Health Med* 1999; **21**: 453–8.
- [24]Sanya EO, Akande TM, Opadijo G, Olarinoye JK, Bajuwoye BJ. Pattern and outcome of medical admission of elderly patients seen at University of Ilorin Teaching Hospital, Ilorin. *Afr J Med Sci* 2008; **37**(4): 375–81.
- [25]Garko SB, Ekweani CN, Anyiam CA. Duration of hospital stay and mortality in the medical ward of Ahmadu Bello University Teaching Hospital, Kaduna. *Ann Afric Med* 2003; **2** (2): 68–71.
- [26]Adegboyega AA, Oyinloye ED, Idowu TG, Omopariola AO. Empirical antibiotic prescription by dentists for oro–facial infections at a Nigerian Teaching Hospital. *Niger J Med* 1997; **6**: 46–9.