STELLENBOSCH UNIVERSITY

FACULTY OF MEDICINE AND HEALTH SCIENCES

HIV/AIDS RELATED DEATHS AND MODIFIABLE RISK FACTORS: A DESCRIPTIVE STUDY OF MEDICAL ADMISSIONS AT OSHAKATI INTERMEDIATE HOSPITAL IN NORTHERN NAMIBIA.

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Thesis submitted in partial fulfilment of the requirements for the degree MMed (Family Medicine)

At

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Supervisor: Professor Bob Mash

DECLARATION

I, **Nuru Kaddu MGORI**, the undersigned, hereby declare that the work contained in this assignment is my original work and that I have not previously submitted it, in its entirety or in part, at any university for a degree. I also declare that ethical approval for the study was obtained from Health Research Ethics Committee of Stellenbosch University (Reference number: N12/11/301)

Signature… …….

Date …02ND September 2014……

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Signature: .....Date: 05TH MAY 2015..."

ABSTRACT

Introduction

High rates of HIV infection have decreased life expectancy in many African countries. Regardless of worldwide efforts to escalate treatment, care and prevention strategies, the number of deaths due to AIDS related disorders is still high. Local health care workers at Oshakati state hospital in Namibia suspect that there are modifiable factors in the care of HIV/AIDS patients, which can be identified and improved upon.

Objective

To describe the HIV/AIDS related causes of adult mortality and identify modifiable factors amongst patients admitted to Oshakati hospital.

Method

Data was extracted retrospectively and coded using the modified CoDe protocol for AIDS. Modifiable factors relating to the patient, health system or clinical care were identified using a standardised data collection tool.

Results

A total of 177 HIV/AIDS patients were identified, 94 (53.1%) were male and 120 (68%) had CD4 count less than 200 cells/ml. The common HIV related death were tuberculosis (25.9%), renal failure (15.8%), Pneumocystis jirovecii pneumonia (11.3%), Cryptococcal meningitis (9%), HIV wasting syndrome (7.9%) and AIDS defining malignancy (7.9%). The analysis revealed 281 modifiable factors; patient related factors were the commonest 153 (54.4%), followed by health system factors 97 (34.5%) and health care personnel factors 31 (11%).

Conclusion

Findings have highlighted the challenges in overall HIV/AIDS inpatient care and surrounding primary care facilities. The identification of specific modifiable factors can be used to reduce mortality by providing training as well as rational monitoring, planning and resource allocation.

INTRODUCTION

HIV/AIDS is one of the major global public health problems and causes substantial morbidity, mortality, negative socioeconomic impact, and human suffering.[1-2] In the last 20 years, HIV/AIDS has become a pandemic disease, claiming some 20 million lives.[1] By the end of 2010; an estimated 34 million people of all age groups [31.6 million–35.2 million] were living with HIV worldwide.[1, 2]

Sub-Saharan Africa, with only 12% of the global population, ranks top amongst regions that are drastically affected by HIV.[3] The region contributes 68% of all HIV/AIDS patients in the world; while South East Asia has 12%, Eastern Europe and Central Asia 4%, Latin America 4% and North America 4%. South Africa has the highest number of people living with HIV/AIDS (more than 4 million).[2]

Namibia is among the countries which are significantly affected by HIV/AIDS. It has a relatively small population of 2.1 million and the Ministry of Health and Social Services estimate the HIV prevalence rate to be 17.8%.[4] Furthermore in 2011/12 it was estimated that 193,000 adults and children were living with HIV. This number is predicted to increase to 196,000 in the year 2015/2016.[5]

The HIV/AIDS epidemic is the largest contributor to the burden of disease in Namibia, contributing 37% to indirect causes of maternal mortality, which is an increase of 50% from 2000 to 2006. Furthermore, life expectancy has decreased from 62 years in 1996 to 44 years in 2006 due to HIV/AIDS.[4, 5]

Over the past two decades, the government of Namibia has prioritized HIV and AIDS in its development goals for 2030. This has led to increases in universal access to antiretroviral treatment, with coverage of between 50-80% of eligible patients.[2]

Strategies used to curb HIV/AIDS morbidity and mortality in Namibia include provision of free highly active antiretroviral therapy (HAART); recruitment, re-training and retention of health workers; health education; screening for and ultimately treatment of opportunistic infections as well as sexual transmitted diseases.[3-4] The screening for opportunistic infections and preventive therapy is offered by both hospitals and clinics and includes provision of isoniazid, co-trimoxazole, fluconazole and malaria prophylaxis in pregnancy. Ongoing adherence counselling, and retention of patients at the clinic level may also help reduce mortality and morbidity.[4-13]

Despite the national efforts, premature deaths from HIV/AIDS continue and reflect deficiencies in quality of care at different levels of the health system.[4] Quality improvement projects have directed their energy at the clinic level, where most of HIV clients are clinically stable, whilst less effort has been directed at those admitted to hospital with acute conditions.[5]

Like any other chronic condition the management and progression of HIV/AIDS has both non-modifiable and modifiable factor. Modifiable factors are omissions or commissions that occur during the process of patient care and which subsequently lead to substandard care. They could be related to the patient, their caregiver, health care workers or the health system.[6, 13]

Non-modifiable risk factors include age, race and gender. Modifiable non HIV specific factors include smoking status, body mass index, hypertension, diabetes, hepatitis C and B status. Other modifiable HIV specific factors include, for example, the patient's CD4 count and viral load.[14]

There has been no formal study to assess the causes of death and modifiable factors related to inpatient mortality among HIV-infected patients in Namibia. Local healthcare workers suspect that there are many modifiable factors affecting patient outcomes within Oshakati Hospital. Identification of these modifiable risk factors and prompt interventions may provide insight into how to improve the management of HIV/AIDS patients admitted in our hospital.[14, 15]

AIM AND OBJECTIVES

The aim of the study was to investigate the modifiable factors contributing to HIV/AIDS related deaths amongst adults in Oshakati Intermediate Hospital during 1st January 2011-31st December 2011. The objectives were to:

- Describe the proportion of HIV/AIDS related deaths out of all deaths in the medical wards
- Describe the socio-demographic and clinical profile of patients that died from HIV/AIDS related causes
- Determine modifiable factors in their clinical care that might have contributed to their death
- Recommend improvement in the quality of care at the hospital

METHODS

Study design

This was a descriptive study utilizing data extracted retrospectively from the medical records of patients who died of HIV related disease.

Study setting

The study was undertaken at Oshakati Intermediate Hospital, which is located in Oshana region, Northern Namibia. It is a 750-bed public hospital, serving approximately 750,000 Namibians and an unknown number of Angolans. The region has no district hospital;

therefore Oshakati Intermediate Hospital receives referrals from local primary care clinics as well as district hospitals in the Omusati, Kunene, Ohangwena, and Oshikoto regions.

Oshakati Intermediate Hospital is also a teaching hospital; and has relatively more staff than nearby district hospitals. The internal medicine department alone has four specialist physicians, a HIV/AIDS clinical mentor, two medical practitioners, two interns and 14 nurses. The male and female wards have 130 beds with three high dependency units. The HAART centre, oncology clinic, and medical outpatient department are under the umbrella of the internal medicine department.

Data collection

Folders from patients who died of HIV related causes were selected for data collection. Only patients with a confirmed HIV positive test result were included.

An auditing team was established that consisted of the researcher, four specialist physicians, HIV/AIDS clinical mentor, an intern doctor, registered nurses and one administrator. This team was responsible for reviewing patient files from medical records and determining the diagnoses, HIV related death and likely modifiable factors.

Basic clinical and demographic information was extracted for each patient in a standardised way: age, gender, HIV status, HAARTstatus, length of stay in the ward, CD4 counts, and viral loads.

The diagnoses was determined after a review of the patients' medical history from the patients' health booklets, nurses' notes, clinical notes made by the admitting doctor, and progress reports from nurses and doctors at different points of care such as casualty, medical outpatients, inpatients and referral letters. The results of investigations were reviewed, such as laboratory results and imaging. Results which were not in the files were traced manually using the available requisition numbers.

A protocol for determining the HIV related cause of death, the CoDe system, was adapted from the Copenhagen HIV Programme, Centre of Global Excellence, [16] which is the standardized system for classification and coding of deaths in studies of patients with HIV infection based on detailed data collection of information on the causes of death and contributing factors. The World Health Organization's staging system was also used to categorise AIDS specific causes of death.[2] When there were disagreements between the reviewers, a consensus agreement with the clinical HIV mentor was reached. The mentor is an employee of the International Training and Education Center for Health in Namibia, covering the Northern Region.

The team then considered potential modifiable factors that could be related to the patient, their caregiver, their healthcare workers or the performance of the health system. The data collection tool and process used was modeled on similar approaches in the Child Healthcare

Problem Identification Programme (CHPIP system), but adapted to adults with HIV.[15] The study supervisor independently assessed the construction of the tool to improve its validity.

HIV/AIDs related deaths were multi-factorial, several factors might interact to contribute to deaths, in this study all modifiable factors were assessed per patient folder. We identified 281 modifiable factors that had contributed to HIV related deaths.

Typical patient and caregiver related modifiable factors were delays in initial presentation, follow up or defaulting from treatment. Typical health care worker related factors were substandard quality of care during patient assessment, management or monitoring. Typical health care system related modifiable factors were a lack of consumables, such as essential medications, or lack of access to intensive care, respiratory support or dialysis interventions.

A pilot study was conducted to assess the quality of clinical notes, before the study. Pre-testing of the study instrument was done a week before execution of the study on the records of patients with HIV who had recently died at the hospital. After reviewing 21 files for the pilot study, questions which were not clear were rephrased to ensure that appropriate information would be captured in the future.

Data analysis

All data was captured on a form designed in Microsoft Access and this programme was subsequently used to produce a data spread sheet in Microsoft Excel. Data was cleaned and verified to minimize entry errors, outliers and values that were missed. Frequencies and percentages were calculated for categorical data. Statisticians at the Centre for Statistical Consultation from Stellenbosch University were consulted for inferential data analysis. Inferential data analysis was done using the Statistical Package for Social Scientists (SPSS) software. The Chi square test was used to analyze the association between the dependent and independent variables.

Ethical considerations

The study was of minimal risk as it involved data collection from medical records. There was no direct benefit to study participants; however the results have identified ways of improving HIV/AIDS care. The proposal was submitted for ethics approval to the Health Research Ethics Committee of Stellenbosch University and received a reference number S12/11/301. The study was also approved by Oshakati Intermediate Hospital ethics committee. As the research was a retrospective study involving a review of medical records from deceased patients a waiver of informed consent was given by the ethics committees. Confidentiality was maintained throughout the study, there was no documentation of names and only the file numbers were recorded to enable capturing data. No personal identifiers were required for the analysis or reporting.

RESULTS

General characteristic of HIV infected patients

There were 2452 admissions, in both medical wards, during the period 1st January 2011 to 31st December 2011. The overall number of deaths was 564 (23.0%), and of these deaths 201/564 (case fatality rate of 35.7%) were documented as related to HIV. Out of these 201 deaths the folder was retrieved for 177 patients.

Among 177 audited folders, 94 (53.1%) patients were on HAART and 48 (51.1%) had been initiated on HAART within the previous 90 days. Table 1 summarizes characteristics of the study population.

Table 1: General Characteristics of HIV infected patients

Characteristics	All (N=177) n (%)	Males (N=94) n (%)	Females (N=83) n (%)
Age group (years)			
15-24	22 (12)	12 (13)	10 (12)
25-44	89 (50)	44 (47)	45 (54)
45-64	55 (31)	31 (33)	24 (29)
≥ 65	11 (6)	7 (7)	4 (5)
Duration of hospital stay (days)			
<1	48 (27)	30 (62)	18 (37)
1-14	93 (52)	40 (43)	53 (57)
15-28	21 (12)	13 (62)	8 (38)
>28	15 (8)	11 (73)	4 (27)
CD4 (cells/mm$^{3)}$			
<200	120 (68)	64 (53)	56 (47)
200+	57 (32)	30 (53)	27 (47)
HAART status			
PreHAART	83 (47)	40 (48)	43 (52)

On HAART <15 days	15 (16)	10 (67)	5 (33)
On HAART 15-90 days	33 (35)	15 (45)	18 (55)
On HAART 91-365 days	15 (16)	10 (67)	5 (33)
On HAART >365 days	31 (33)	19 (61)	12 (39)
HAART (TOTAL)	94 (53)	54 (57)	40 (43)

HIV related deaths

Amongst reviewed patients 82% died of HIV/AIDS defining conditions, while 18% had Non-AIDS defining diseases. Male patients died more of AIDS defining conditions than female patients (p=0.019). The underlying causes of deaths and frequencies are shown in Table 2. Tuberculosis disease accounted for most deaths, followed by renal failure, Pneumocystis pneumonia, cryptococcal meningitis and HIV wasting syndrome.

Table 2: Causes of deaths (N=177)

Causes of deaths	n (%)
Extra pulmonary tuberculosis	30 (16.9)
Renal failure	28 (15.8)
Pneumocystis pneumonia	20 (11.3)
Pulmonary tuberculosis	16 (9.0)
Cryptococcal meningitis	15 (8.5)
HIV wasting syndrome	14 (7.9)
AIDS defining malignancies	14 (7.9)
Haematological disease	9 (5.1)
Chronic diarrhoea	8 (4.5)
CNS disease	7 (4.0)
Severe bacterial infections	5 (2.8)
Liver failure other than viral hepatitis	4 (2.3)
Alcohol abuse	3 (1.7)
Non AIDS malignancy	2 (1.1)
Pulmonary thrombo-embolism	1 (0.6)
Cardiovascular disease	1 (0.6)

Modifiable factors

There were three broad modifiable factors detected, patient and caregiver related factors accounted for 153 (54.4%), followed by health care system factors 97 (34.5%) and finally health care worker related factors 31 (11.0%). Delayed presentation to a health facility was the commonest factor overall and accounted for 85% of patient or caregiver related factors. Failure to provide standard critical care services, hemodialysis, or ventilator support accounted for 86% of health system factors and challenges in patient monitoring was the main factors for health care workers (29%). Table 3 summarizes the specific modifiable factors.

Table 3: Modifiable factors

Modifiable factors	**n (%)**
Patient and caregiver related factors (N=153)	
Delayed presentation to a health facility	130 (84.9)
Defaulted HIV treatment	21 (7.4)
Alcohol abuse	2 (1.3)
Health care system factors (N=97)	
Lack of dialysis machine for HIV positive patients	31 (31.9)
Inadequate respiratory support in the ward (oxygen supply)	26 (26.8)
Lack of ICU care for patient with HIV/AIDS	26 (26.8)
Inadequate blood product supply to the ward	6 (6.1)
Inadequate hospital stock of essentials consumables	3 (3.1)
Basic laboratory investigations not available to ward 24hours a day	2 (2.1)
Inadequate ward stock of essential consumables	1 (1.0)
Lack of standardized case management protocols in ward	1 (1.0)
Doctors in the ward inadequately supervised	1 (1.0)
Health care worker factors (N=31)	
Essential treatment not prescribed	4 (12.9)
Inadequate monitoring of kidney disease	4 (12.9)
Inadequate monitoring/ intervention of liver disease	3 (9.7)
Inadequate evaluation of treatable malignancy	1 (3.2)
Inadequate assessment of fitting or comatose patient	6 (19.3)
Inadequate fluid replacement	4 (12.9)
Insufficient case assessment and management in the ward	3 (9.7)
Inadequate switching HAART due to toxicity	2 (6.5)
Inadequate blood chemistry review	1 (3.2)
Doctor called, but did not respond	1 (3.2)
Doctor at peripheral hospital did not call referral hospital	1 (3.2)
Critical HIV patient not reviewed by doctor during weekend	1 (3.2)

DISCUSSION

This study demonstrated that the overall percentage of all deaths in the hospital's medical wards directly attributed to HIV was relatively high at 35%, although this finding was consistent with studies in similar settings.[5-7] As some patients died without an established HIV diagnosis this is also likely to be an under-estimate.

Numerous researchers have reported significant reductions in mortality in HIV/AIDS patients after the introduction of HAART and attention to modifiable factors in the quality of care.[6, 8, 9, 13-20] Modifiable factors identified in this study have highlighted several areas for potential improvement in adult care, treatment and monitoring.

Patients related factors played a significant role through delayed presentation and defaulting of treatment, which led to patients presenting with more advanced disease that was more difficult to treat successfully. Reasons for such late presentation and poor adherence identified in other studies include barriers to accessing care, forgetfulness, socio-economic constraints, fear of discrimination or stigmatization, drug toxicity and limited knowledge about HIV/AIDS.[6, 7, 13,15,22,28] It is reported that early HIV diagnosis, early help seeking behavior, easy access to care, prompt initiation of HAART for eligible patients and maintaining good adherence are critical for successful HIV/AIDS treatment.[7, 22-27] Further studies are needed to identify barriers to accessing care in our setting and to understand help seeking behavior in local communities.

Within the healthcare system at the hospital there appeared to be discrimination towards patients with HIV in terms of access to intensive care beds. Such discrimination might be related to a shortage of ICU beds, lack of HIV/AIDs knowledge and negative attitudes towards critically ill patients. Similar findings on HIV and ICU care have been noted in some developing countries while in South Africa, India and Brazil there are regulatory bodies that govern and prevent non-discriminatory practice.[29] Therefore there is a need for policy makers, health system administrators and clinicians to devise policy frameworks or guidelines to ensure non-discriminatory access to ICU care regardless of HIV status.

Lack of dialysis for HIV positive patients with renal failure contributed significantly to deaths as we depend mainly on conservative management. The importance of dialysis and close monitoring of renal function in patient with renal impairment cannot be overemphasized, as there is rapid increase of renal failure in the HIV population worldwide. The HIV virus and Tenofovir based therapy are both associated with renal diseases.[30] There appears to be a lack of insight and prioritization of procurement for patients with HIV although discussions with the management team revealed plans to construct a new dialysis unit by 2018. In the meantime there is in-service training for peritoneal dialysis as a short term solution.

Health system managers must also ensure that essential consumables are available such as medication and should improve the turnaround time for crucial laboratory results. Blood

products such as platelets take 48-72 hours to arrive from Windhoek and there is a need to construct a blood bank for northern Namibia.

Many patients who died were eligible for HAART, which reflects a gap in existing strategies for the screening, prevention and treatment of opportunistic infections at primary health care level. There is a need for our HAART centres at Oshakati and surrounding district hospitals to implement quality improvement projects to address this issue.[4, 32]

The hospital relies on many foreign trained healthcare workers who may not be familiar with HIV management. Therefore there is a need to familiarise junior colleagues with local guidelines and expose them to the HAART service with the target of improving their HIV/AIDS case management skills.[32] Deficiencies in individual clinical care may be addressed by more effective continuing professional development as well as regular risk management meetings that discuss morbidity and mortality. The hospital should mandate attendance at educational meetings and ensure more effective interactive small group learning as opposed to didactic approaches. Disciplinary measure should be taken against health care workers who will not follow ethical rules and continue to practice negligently. Several studies have shown that greater physician experience and expertise is associated with reduced patient morbidity and mortality.[26, 31]

Not all of the medical records could be retrieved and we also faced challenges in missing information from medical records. Data on the socio demographic and economic status of the patients were often not available in the folders and therefore the effect on health seeking practice could not be studied. Clinical notes in some files had poor handwriting which made data collection difficult. A prospective design study and electronic medical recording should be done to minimized these limitations which shall capture detailed patient`s clinical information to assist in establishing death causation.

The causes of deaths were based on clinical findings recorded in the notes and there were no postmortems done in all cases; this is mainly due to social-cultural barriers. Findings from postmortem examination could have better defined the cause deaths.

Globally there are challenges in coding HIV deaths; and the available tools do not reflect common conditions affecting Sub-Saharan Africa. We overcame this difficulty in our study by using both the WHO and CoDe to capture all causes.

CONCLUSION

HIV/AIDS contributed significantly to overall in-patient mortality and AIDS defining diseases were the leading causes of deaths in the hospital. The commonest causes of death were tuberculosis, renal failure and Pneumocystis pneumonia. Patient and caregiver related factors, particularly delays in seeking healthcare, were the commonest modifiable factors. Access to critical care, dialysis and ventilator support as well as poor monitoring of patients were the main modifiable factors in the hospital. Future studies should investigate issues

related to the accessibility of healthcare and initiation of HAART at primary care facilities. Continuing professional development, routine risk management, and better planning and procurement of essential resources will help to reduce deaths in the hospital.

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