HIV and Male Fertility at the University Teaching Hospital Lusaka

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Background: There has been anecdotal evidence of a declining male fertility in Zambia over the last 10 years[1]. This prospective study of men seen in the fertility clinic was designed to look for an association between the increasing HIV infection in the population and male fertility.
Methods: This prospective study compared the prevalence of HIV in men with a confirmed diagnosis of infertility seen at the Urology Clinic, to the national HIV prevalence among men of child bearing age. The study was done from October 2006 to October 2007.
Results: A total of 34 men were diagnosed with infertility and included in the study. Among these patients 9 were seropositive. This gave an HIV prevalence of 26%. There was a statistically significant difference with the normal population of 13% ($p = 0.043$).
Conclusion: HIV infection is higher in men seeking fertility treatment than in the general population. Further studies are required to determine the precise relationship between HIV and Male Fertility at the University Teaching Hospital Lusaka.

Introduction

Zambia is a landlocked country in south central Africa covering 752,612 square miles. It has a population of 10 million and a per capita income of 394USD dollars per year[2]. The University Teaching Hospital (UTH) in Lusaka is the main reference hospital in Zambia, it caters for an immediate catchment area, serving 1.3 million people in Lusaka and Lusaka province. Zambia has 9 provinces, Lusaka is the largest province. It is on the main line of rail and includes the capital city of Zambia, Lusaka. The UTH also serves a national catchment of 10 million people because it houses the main reference laboratory in the country

In Zambia, the largest burden of diseases is due to infectious diseases in particular malaria and HIV[3]. In the University Teaching Hospital a notable increase in testicular biopsies for infertility has been observed over the last 10 years[4]. In the same period the number of male patients attending for fertility problems has increased. The authors speculated that the country wide decline in fertility may be related to the high national HIV prevalence. In order to assess this, a one year prospective pilot study was set up in the urology clinic at the University Teaching hospital Lusaka. The purpose of this study was to determine if HIV prevalence among male patients attending the urology clinic was higher than the national rates for men in the same age range.

Patients and Methods

All male patients attending the fertility clinic in Urology outpatient section from October 2006 to October 2007 who consented were included in the study. Clients were asked to fill in a data capture sheet and a full physical examination by a consultant urologist was done. All patients had 3 semen samples at three separate times and the mean result was used. Participants were considered infertile if the mean sperm count was below 20 $x10^6$/ml, as defined by World Health Organization criteria[5], or if they had abnormalities of morphology ,viability and motility as defined by WHO. Primary infertility was defined as, a client who has never had a child before, while secondary infertility was defined as having had a child before.

All patients had pre test and post test counseling. Two laboratory test for HIV tests were done with a screening (ELISA test) and confirmatory western blot test. The HIV prevalence among these patients was worked out and compared to the national HIV prevalence of men in the age range 15-49 as provided by the National Demographic Health survey[1].

Results

A total of 34 patientss were enrolled into the study. The age range was 26 to 44 years. The mean age was 33 years. No patient had any physical abnormality found on urological examination. Seventeen (50%) had an average sperm count of 20 x 10^6/ml or below. The rest had a normal sperm count with no abnormalities of sperm. Thirty two (95%) Most patientss had primary infertility (32). Only 5%(2) had secondary infertility. Nine clients were HIV positive, giving an HIV prevalence among this group of 26%. The National HIV prevalence for 15-49 age group is 13%(figure 1).

Using the standard T test with Epi-info 2000 version there was a statistically significant difference in HIV prevalence between the two populations, the p-value was calculated to be 0.043.

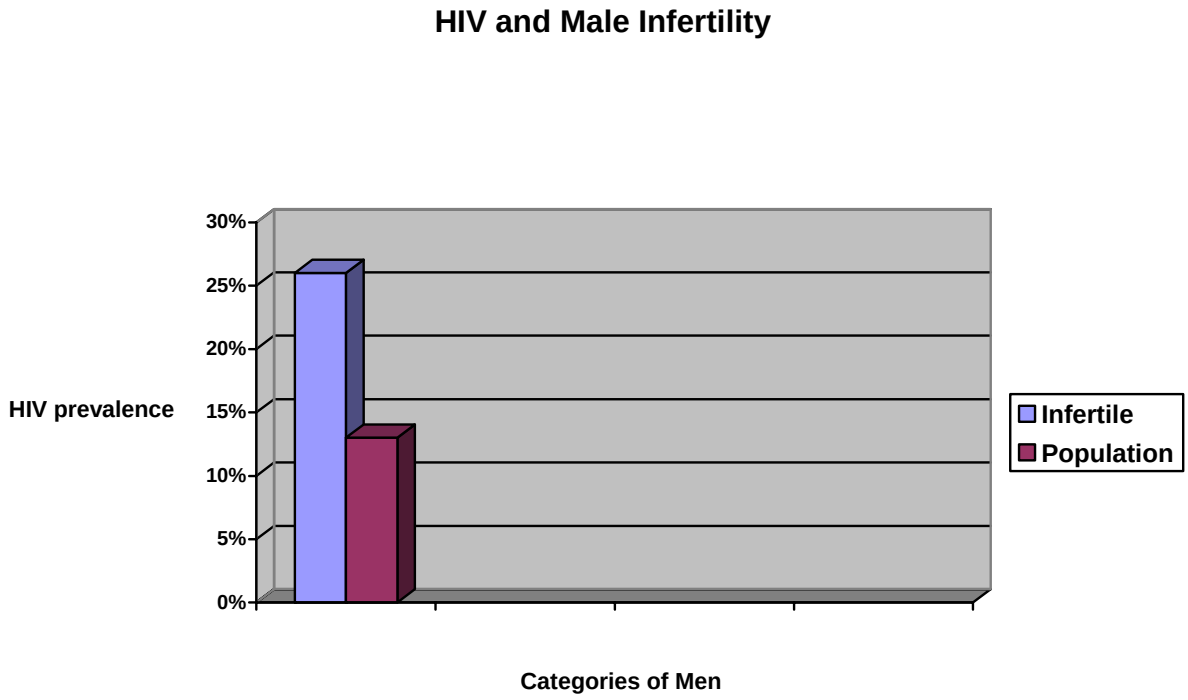

Figure 1. Frequency of HIV in Infertile and Normal Population

Discussion

HIV infection affects male and female reproduction. Females with HIV infection may suffer from abortions, opportunistic infections and other pathological disease which affect the reproductive system[6]. According to the UNFPA there has been a decline in male fertility over the last 10 years[6]. A Zambia health and demographics survey of 2001-2 revealed a reduction in fertility rates from 7.2 births per woman in the 1980 survey to 5.9[1]. This decline is general in all the nine provinces but most marked in the Copperbelt and Lusaka provinces. These are also the provinces with the highest HIV prevalence rates of 17.3% and 18.7% respectively[1]. There has not been a corresponding increase in contraception usage in the country.

The decline in fertility has not only affected Zambia but has also been observed in many of the countries in the subsaharan region with high HIV prevalence[7]. The Subsaharan region which has a high HIV prevalence has had a marked decline in fertility during the era of HIV. From the overall fertility rates of 7.0 there have been general declines to about 5.0. Botswana from 7.1 in 1981 to 4.4 in 1995-2000, Ghana from 7.2 in 1960 to 4.5 in 1998, Kenya from 8.0 in 1975-77 to 4.6 in 1998, South Africa from 6.4 in 1960 to 3.1 in 1995-2000, Swaziland from 6.9 in 1966 to 4.8 in 1995-2000, and Zimbabwe from 8.3 in 1969 to 4.0 in 1996-99. Most other African countries are currently experiencing modest fertility declines[7,8,9].

The contraception use in Zambia has been at 14.8%, which is one of the lowest in the sub-region[1]. Our study showed a two-fold increase in the in HIV prevalence among males with infertility (26%) compared to that of the rest of the sexually active age groups. In view of the effect of HIV on the male reproductive system this is not unusual. In the males, HIV causes impotence, testicular atrophy and various sperm dysfunctions[10]. HIV infection is associated with erectile dysfunction, testicular tumours, tuberculosis of the testis and autonomic nerve dysfunctions.

There is a high concentration of the HIV virus in the semen and it is known that when the CD4 count declines below 200/ml the virus causes disease in the Urogenital system. A pubmed review of literature on HIV and male fertility shows that there are few studies on this subject. Further studies are required to determine the precise effect of HIV on male fertility whether this is direct or indirect and also to investigate if this effect is reversible by the use of Ante retroviral therapy.

Acknowledgement

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