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Full Length Research Paper

The impact of antenatal voluntary counseling and testing for HIV on future fertility intentions, desired family size and contraception in Uganda

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This study aimed is at assessing the impact of voluntary counseling and testing for HIV on family planning in a setting of high HIV prevalence and high TFR. An intervention study was conducted between January and March 2004 among women who had been counseled about HIV, STI and contraception during pregnancy followed with voluntary HIV testing. 121 HIV positive and 206 HIV negative attending antenatal clinic aged 24.6 ± 5.4 years (range 17 - 36 years) participated in this study. The independent and significant (P < 0.01) determinants of future fertility after current pregnancy were HIV sero-negative status (OR = 7.9 95% CI 4 - 16.1), monogamy (OR = 2.795 CI 1.2 - 5.5), ideal family size as ≥ 4 children (OR = 2.7 95% CI 1.3 - 5.5) and current number of live children = 0 (OR 5.8 95% CI 3.1 - 10). Knowledge of HIV serostatus had significant impact on ideal family size, but no impact on the choice of contraception method.

Key words: Uganda, HIV/AIDS, contraception, family planning.

INTRODUCTION

Maternal to child transmission of HIV (MTCT) is the largest mode of HIV transmission among children, all over the world (Unaids, 2008). While the bulk of MTCT of HIV occurs in low socio-economic settings, prevention of maternal to child transmission of HIV (PMTCT) activities worldwide, have shown promising outcomes (Hladik et al., 2009). Even in the developing countries the uptake of PMTCT varies from one setting to another, with differing success (Karcher, 2006). This variation may be partly due to the focus on PMTCT without taking into consideration the individual mother's specific fertility (Reynolds et al., 2006) and health needs.

Though the HIV prevalence rate in Uganda has progressively declined over the years, it has stabilized at a relatively high level: 6.7% in the general population and 7.5% among women aged 15 - 49 (MOH, 2006). With total fertility rate (TFR) estimated at 6.7 (UBOS, 2006), the burden of paediatric HIV acquired via maternal to child transmission (MTCT) is likely to be enormous. Though PMTCT interventions were initiated in 2000 in the capital city of Kampala, and scaled out throughout the country in 2003, the effectiveness of these interventions is hampered by low uptake, and by shortage of supplies and personnel (WHO, 2008, Bajunirwe et al., 2004). Globally 2 million children younger than 15 years have HIV and 90% live in Sub-Saharan Africa (HIV Data, 2008). Most infection is acquired via Maternal to child trans-mission (HIV Data, 2008). The burden of paediatric HIV in Uganda is estimated at 120,000 - 150,000 children living with HIV so that an estimated 25,000 vertical trans-missions and 17,000 paediatric AIDS deaths occur per

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year (UNAIDS WHO, 2008).

A positive HIV serostatus has been known to negatively influence future fertility intentions (Taulo et al., 2009). With increasingly available ARV therapy worldwide, several HIV positive clients are considering child birth (Chen et al., 2001, Stanwood et al., 2007). Education level, socio-economic status, ideal family size, social cultural expectations/support and sex preference are back ground factors that affect fertility intentions in sub-Saharan Africa (Blanc and Wolff, 1996; VanLandigham, 1993; Myer et al., 2010; Ezeh, 1993).

The unmet need for family planning in Sub-Saharan Africa ranges between 20 -30% (Cleland et al., 2006). In Uganda, it is estimated that increasing the provision and uptake of family planning could lead to more than 20% reduction in MTCT infections and almost 20% reduction in paediatric HIV deaths (Hladik et al., 2009).

Therefore, the objective of this study was to assess the impact of voluntary counseling and testing for HIV in the antenatal period on the future fertility intentions, contraception choices and other underlying factors that contribute to the change in the desired family size following knowledge of HIV serostatus.

MATERIALS AND METHODS

This was an interventional and analytical study carried out between January and March 2004. The study was conducted at the Ante-natal clinics (ANC) of Mulago hospital, a tertiary health unit which also doubles as a district hospital for Kampala district in Uganda. It has run a mother to child HIV prevention (PMTCT) since 2000, run by health workers and health counselors.

Target population, Inclusion and exclusion criteria

Women who have undergone VCT for PMTCT in Uganda were eligible for the study. All mothers who have had VCT and have received their results at least four weeks previously were included. Those who were very sick or unable to express themselves and those who did not give informed consent were excluded.

Sample size

Using EPI-INFO statistical formula for unmatched cohort and cross-sectional studies (http://www.cdc.gov/epiinfo/), Ratio of 2:1 HIV positive: HIV negative at a confidence interval of 95% and power of 80% was chosen for calculating the sample size as follows: From the UDHS 2000/2001 (Hubacher et al., 2008) 38% of the women in reproductive age did not desire another child. 91.3% of the women in the urban centres were HIV negative. We then made an assumption that 38% of the HIV negative women did not desire another child. There fore it is deduced that 62% of HIV negative women in reproductive years desired more children. Assuming that, the desire for more children in HIV positive women is half that of HIV negative women, then the sample size will be 324, including 216 HIV negative and 108 HIV positive women. Size was rounded to 330 women.

Data were collected using a structured and standardized questionnaire after obtaining ethical clearance from Mulago hospital and Makerere University Faculty of Medicine Ethical boards. Pregnant women in the antenatal clinic were offered group pre-test counseling about HIV infection and prevention including PMTCT. Those who accepted the HIV test had their blood tested and their results were given individually either immediately or on subsequent antenatal visit. When accessible, their partners were given similar counseling or the couple was counseled together. The individual / couple then got post-test counseling about behavior to prevent re-infection, ensure adequate nutrition, how to prevent vertical HIV transmission, infant feeding options and family planning. The mothers were also counseled about the different options of contraception: combined oral pills, tubal ligation, injectable contraception, vasectomy and dual contraception.

The variables of interest included

Data on socio-demographic characteristic, future pregnancy intentions, past obstetric history, sex of each live child and the number of living children, current knowledge about contraceptives including behavioral strategies to prevent MTCT of HIV, previous contraception history, future contraception method, and whether the participant had discussed the out come of HIV test with the spouse or other people was collected (Cleland et al., 2006).

Statistical analysis

The continuous data was summarized and the means, median, modes and standard deviations were computed. The categorical data was presented in form of frequencies, percentages, bar graphs and pie charts. The socio-demographic characteristics of the women who chose to have more children and those who opted to stop having children among the HIV positive and HIV negative respondents were compared. The chi-square test was used, at a significance level of $P < 0.05$ to identify the differences.

For the future fertility intentions, the univariate and multivariate Odds ratios (OR) and the 95% confidence (95% CI) levels were calculated. To adjust for confounding factors in multivariate analysis, regression models were performed to identify the independent determinants of future fertility intentions.

All analyses were done using the statistical package for social sciences (SPSS) Version 15 for Windows (SPSS Inc., Chicago, IL, USA).

RESULTS

Among 330 women invited to participate in the study, 327 (99% response rate) participated and completed the survey.

Socio-demographic characteristics

HIV positive (n = 121; mean age 24.6 ± 5.4, range 17 - 36 years) and HIV negative (n = 206; mean age 24.15. ± 3, range 16 - 38 years) mothers were comparable ($P > 0.05$) for the majority of socio-demographic characteristics (results not shown except for the marital status and the nature of the marital union (Table 1). Indeed, the distribution of participants (117 HIV positive and 206 with complete data) varied significantly across the categories

(global Chi square = 17.1; P = 0.004 and nature of union (global Chi square 18.5; P < 0.0001) of marital status.

Married were more prevalent among HIV negative while divorced and widowed were more frequent among HIV positive respondents. Polygamy was more reported among HIV positive than among HIV negatives.

Ideal family size and mean number of desired children after current pregnancy

The mean number of children defining an ideal family size was significantly (P = 0.037) higher in HIV negative respondents (4 ± 1 children) than in HIV positive respondents (3 ± 1). To the question about number of more children intended after the current pregnancy, HIV positives desired less (P < 0.0001) children (mean number = 1) than HIV negatives (mean number = 2) despite the similar (P = 0.333) present mean number of live children in HIV positives (n = 2) and HIV negatives (n = 2).

Mothers who planned not to have another pregnancy in the future were more (P < 0.0001) frequent in HIV positive group (62% n = 75) than in HIV negative group (28% n = 57). However, the proportion of undecided mothers in the HIV positive (5% n = 6) was similar (P = 0.510) to that in HIV negative (1.5% n = 3) respondents.

Table 2 presents the reasons for having more children after the current pregnancy in the study groups, the differences of proportions being not significant (global chi square 12.578; P = 0.083).

Impact of specific education on maternal to child transmission of HIV and family planning on responses of participants

Following the information, education, and counseling sessions, 42 (35.3%) of the HIV positive respondents reported that their intended family sizes were different from the ideal family sizes. Of these 37 intended to have fewer numbers of children. Only 18 (8.3%) of the HIV negative respondents reported that their intended family sizes were different from the ideal family size. Fourteen of the HIV negatives intended to have a family size smaller family size while 4 intended to have a bigger family size so as to fulfill the desires of a new partner.

Table 3 summarizes the main significant and non significant reasons for change in ideal family size after the intervention.

Health concerns, economic hardships, unstable marriages and new husband were the reasons for change in the ideal family size significantly different between HIV positives and HIV negatives. For the HIV positive respondents the most outstanding reason given for the difference between ideal family size and the total number of children intended in future were health concerns. These included anticipated deterioration of health status, recurrent blood loss, and previous caesarean section. Economic hardships, unstable marriage and new husband were the most significant reasons for change in ideal family size HIV negatives.

Univariate and multivariate analyses of determinants of future fertility after current pregnancy

Within the HIV positive group, age below 25 years, primigravida, and sharing HIV serostatus results with husband or partner were the significant (P < 0.001) variables associated with the future decision to have future pregnancy and to bear more children after the current pregnancy (40, 40 and 10% in pro-fertility vs. 10, 4 and 5% in anti-fertility, respectively).

In the HIV negatives, age under 25 (35 vs. 8%), primigravidae (60 vs. 9%), larger ideal (> 4 children) family size (33 vs. 14%) and sharing with husband the same ideal family size (53 vs. 17%) were more and significantly (P < 0.001) associated with future fertility.

In all participants, primigravidae, monogamy and ideal family size (> 4 children) young age (< 25) and HIV negative serostatus showed a significant (P < 0.05) univariate association with future (pregnancy and children) fertility intentions (results not shown).

Using multivariate analysis (logistic regression model) (Table 4), HIV negative status, primigravidae status, monogamy and ideal family size (> 4 children) were identified as the independent and significant determinants to want more pregnancy and future children. Table 4 independent determinants of future fertility.

However, the future use of the various methods of contraception was not statistically different (global Chi-square 4.754, P = 0.576) between HIV positive and HIV negative respondents who desired no more children (Table 5); and HIV positive and HIV negative respondents who desired more children (Global Chi-square 3.076, P = 0.878) (Table 6).

DISCUSSION

The present study was designed to establish potential associations between fertility, contraception and different epidemiological variables including HIV status among Ugandan mothers attending ANC. This was a crucial challenge in a country previously known for high prevalence of HIV in the general population (UNAIDS/WHO, 2009) and in women within the reproductive age bracket (MOH, 2006), but now with a declining prevalence of HIV (STD/AIDS, 2002).

As African culture (Makinwa, 1993; HRC, 1993) and HIV epidemic (Ntozi, 2002) have significant influence on the reproduction, and family size, it was important to

Table 1. Categories and nature of union of marital status by HIV status

Variable	HIV negative		HIV positive	
Marital status	n = 204	%	n = 121	%
Married	159	77.9	86	71.7
Co-habiting	32	15.7	16	12.5
Separated/divorced	2	1.0	12	10
Single	11	5.4	6	5
Widowed	0	0	1	0.8
Nature of marital union	n = 206	%	n =121	%
Polygamy	37	18	42	34.7
Monogamy	165	80.1	75	61.9
Not sure	4	1.9	4	3.3

Table 2. The reasons for having more children after the current pregnancy.

Reason	HIV serostatus	
	Positive; n = 40 (%)	Negative; n = 104 (%)
Still fertile	19 (47.5)	64 (61.5)
Partner's wish	6 (15)	39 (37.5)
To get ideal family size	6 (15)	5 (4.8)
To replace dead child(ren)	4 (10)	6 (5.8)
Wanted girl	3 (7.5)	6 (5.8)
Wanted boy	2 (5)	8 (7.7)
Child to get company	0 (00)	5 (4.8)
Afraid of family planning	0 (00)	1 (1)

Table 3. Reasons for change in ideal family size after the intervention.

Reasons for change in the ideal family size	HIV positive n =48 (%)	HIV negative n =18 (%)	Chi-square	P value
Health concerns	37 (77.1)	5 (27.8)	16.12	< 0.001*
Economic	4 (8.3)	5 (27.8)	4.14	0.041
Husbands wish	1 (2.1)	0 (00)	0.38	0.540
Religious	1 (2.1)	0 (00)	0.38	0.540
Difficulty in child birth	4 (8.3)	0 (00)	1.57	0.21
Unstable marriage	0 (00)	4 (22.2)	11.18	< 0.001
New husband	1 (2.1)	4 (22.2)	7.47	0.006

conduct an intervention study among pregnant women attending ANC at Mulago Hospital, Uganda.

Many reports about HIV- related family break ups and broken marriages come from Sub-Saharan Africa (Kusimba, 1992). Furthermore the higher proportion of polygamy suggests heterosexual activity with multiple partners, one of the most important sources of HIV transmission in Sub Saharan Africa (UBOS and Macro International Inc., 2007).

Before the intervention, HIV positive respondents were likely to plan future pregnancy as HIV negative respondents. However after gaining knowledge about HIV transmission from mother to baby and complications of HIV disease, a drastic change in response from HIV positive was observed. However monogamous marriages and ideal family size > 4 were positively associated with

Table 4. Independent determinants of future fertility.

Independent variables	Multivariate OR (95% CI)	P
HIV positive vs. HIV negative	7.9 (4 - 16.7)	< 0.01
Primigravidae vs. Multigravidae	4.4 (1.4 - 8.3)	< 0.01
Monogamy vs. polygamy	2.7 (1.3 - 5.5)	< 0.01
Ideal family size > 4 vs. < 4	5.8 (3.1 - 10)	< 0.01

Table 5. Choice of method of contraception for respondents who do not intended to deliver more children.

Method of family planning	HIV Serostatus	
	Positive n = 64 (%)	Negative n = 53 (%)
Pills	10 (14.9)	3(5.7)
Condoms	4(6)	1(1.9)
IUCD	1 (1.5)	1(1.9)
Injection	25(37.3)	24(47.2)
Implants	7(10.4)	6(11.3)
Tubal ligation	17(25.4)	13(24.5)
Undecided	3(4.5)	4(7.75)

Table 6. Choice of method of contraception for respondents who intended to deliver more children.

	HIV Serostatus	
Method of family planning	Positive n = 38 (%)	Negative n = 128 (%)
Pills	6 (15.8)	27(20.9)
Condoms	4(10.5)	10(7.8)
IUCD	0(0)	1(0.8)
Injection	23(60.5)	74(57.4)
Implants	1(2.6)	7(5.4)
Rhythm	0(0)	2(1.6)
Tubal ligation	1(3.6)	3(2.3)
Undecided	3(7.9)	5(3.9)

the intention for future pregnancy.

Since family size determination is not a domain of women in Uganda (Sembajwe, 1977) and in most of Sub-Saharan Africa (Rutenberg et al., 2000), the practical implementation of the intention to negate further pregnancies is bound to be challenged by socio-cultural expectations, irrespective of the HIV sero status of the woman.

Cessation of further child birth in order to avoid vertical or horizontal transmission of HIV did not emerge as a major deterrent. Though pregnancy is not known to accelerate HIV progression, reduced access to medical care in low socio-economic settings, and poor nutrition, make pregnancy risky for every woman HIV positive women inclusive (Williams and Watkins, 1996).

Economic difficulties and unstable marriages featured more as deterrents for intended future pregnancies among the HIV negative people. It is not surprising that high parity was associated with diminished desire for more children. HIV positive serostatus diminishes but does not eliminate desire for future fertility. In Uganda therefore the background factors that have kept TFR high are still quite influential even among HIV positive clients that are not yet on antiretroviral therapy (HIV prevention practices, 1994). Being young and fertile was the most common response given to explain why one intended to have more children irrespective of one's HIV serostatus. This reflects the wish to conform to socio-cultural expectations.

Although HIV positive women who underwent VCT for

PMTCT at the time were discouraged from future pregnancies, 36.4% of the HIV positive respondents still wished to deliver more children. There is therefore a significant risk of MTCT and of horizontal transmission of HIV to sexual partners. A strong extended family structure in most of the tribes in Uganda underscores the need for a woman to continue producing children for as long as one is still fertile (Ntozi, 1995). This is reinforced by the mean age at first birth which in Uganda is about 19.1 years (UBOS and Macro International Inc. 2007). For the HIV positive, delivery of more children may not only be a strategy to avoid social stigma, but also an inherent desire to prove one's fertility and therefore be more socially acceptable.

Therefore an individual though known to be HIV positive may still be expected to at least bear a child before their demise as a way of self propagation. Besides, motherhood boosts self esteem. Given the misfortune of HIV infection, caring for one's children may be the one of the reasons to go on living (Ntozi, 1995, Watts, 1997).

The influence of the partners featured second among motivators for more children in the future. The frequency of HIV negative respondents who intend to deliver more children varies directly with the ideal family size of the spouse. This reflects the importance the respondents attach to the partner's influence in the decisions concerning future pregnancies in Uganda. Secondly, pregnancy and childbirth are not only central to cordiality and stability of a marital union in an African setting but also ensure continued financial and economic support given the fact that most of the respondents were not gainfully employed (Blanc and Wolff, 1996). It is noteworthy that a much smaller percentage of HIV positive compared to HIV negative respondents reported that the partner's wishes should be put into consideration as regards future pregnancy. This reflects the wish for more independent decision-making as far as future pregnancy is concerned among the HIV positive respondents.

This socio-economic pressure on a young woman for more children may lead her to conceal her positive HIV sero-status and proceed to deliver more children or to reveal her status to her spouse with a risk of separation, domestic violence or loss of economic privileges. Since most respondents were young and unemployed, they would in such circumstances be liable to get other partners so as to get economic support. Indeed new spouses were associated with the decision to deliver more children especially for the HIV negative respondents but also for some of the HIV positive respondent. Not only does the practice of remarriages increase risk of HIV transmission to partners, it also promotes MTCT of HIV.

The intention to deliver more children also reflects a wish to have a larger number as security given that child mortality rate is high in Uganda (UBOS and Macro International Inc. 2007). In addition, some of the HIV negative respondents who wished to bear more children wanted to replace dead children or to get the desired/ideal family size. It is therefore very important that PMTCT activities become an integral part of an improved health system that meets the expectations of society and ensures the survival of all, especially the children.

56% of the HIV positive respondents had the courage to share their HIV status with someone else. Revelation of HIV serostatus to spouses by HIV positive respondents was associated with less intention to deliver more children. It is noteworthy that almost 70% of these HIV positive women who shared their serostatus with their partners reported no further intention to bear more children compared to those who shared with a relative or a friend (52 and 50% respectively). This provides evidence that if a couple is given an opportunity to be tested and to share their results a more informed and sustainable choice could be made. 89% of the HIV positive respondents and 91% of the HIV negative respondents who wished to have no more children intended to use some method of contraception.

A study by Malgalhaes et al. (2002) showed that HIV positive women tend to opt for permanent contraception once they are aware of their serostatus (Magalhaes et al., 2002). In this study however, only about 25% of both HIV positive and HIV negative respondents who had no future pregnancy intentions planned to have tubal ligation. This reflects possibility of caving in to anticipated social pressure from spouse or relatives for more children (Lutalo et al., 2000).

Majority of the HIV positive respondents who wanted sterilization had 2 or more living children while for the HIV negative respondents it was 3 or more living children. Irrespective of HIV serostatus, this once again reflect the difficulty for a Ugandan woman to unilaterally stop child birth if she has less than ideal family size (for the specific region of the country).

The choice of future contraception method did not take into account the principle of protection against STDs and re-infection with more virulent and possibly drug resistant HIV strains. Less than 10% of all respondents intended to use dual method. This was the case despite know-ledge of the prevention of STDs including HIV through the use of condoms. This could be result of the difficulty women have in negotiating the use of condoms within marriage.

In Uganda, use of condoms within marriage insinuates mistrust or promiscuous behaviour. Secondly many respondents had not discussed their HIV serostatus with their spouses for fear of domestic violence, neglect or separation. So there would be no feasible explanation for the request for the use of a barrier. This may be the reason why a large percentage of respondents prefer to use injection Depo Provera, the method they can access

without the knowledge of their husband or other people who would put them under pressure to deliver more children.

LIMITATIONS

The present study is limited to some degree by its cross sectional design. Only a prospective longitudinal study should demonstrate the significant predictive role of HIV positive status on reduction in future fertility as the same environmental factors are influencing family planning in both groups.

The sample study is not representative of the general population of Uganda so that the results can not be generalized to other women from other regions of Uganda.

PUBLIC HEALTH PERSPECTIVES

Couple counselling is necessary to address the specific needs of each individual and to help each couple to make an informed decision that will not increase the risk.

Family panning programs should be integrated into voluntary testing and counseling strategies. Indeed voluntary counseling and testing is now a real core part of HIV/AIDS prevention and treatment programs in many African countries such as Ethiopia (Gillespie et al., 2009). This integration will help people to avoid unwanted consequences of their sexual behaviour, HIV and unintended pregnancies. Relevant change in Ethiopian clients occurred after the introduction of family planning services in terms of higher acceptance of contraceptives and family planning services (Gillespie et al., 2009).

Conclusion

Knowledge of HIV serostatus had significant impact on ideal family size, but no impact on the choice of contraception method. Future studies on behavior change concerning condom use and other tools of contraception are needed in this environment influenced more by African traditions than evidence based knowledge.

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