Acceptance of HIV testing among women attending antenatal care in south-western Uganda: risk factors and reasons for test refusal

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Abstract

A problem commonly encountered in programs for prevention of mother-to-child-transmission (PMTCT) of HIV in sub-Saharan Africa is low rates of HIV test acceptance among pregnant women.

In this study, we examined risk factors and reasons for HIV test refusal among 432 women attending three antenatal care clinics offering PMTCT in urban and semi-urban parts of the Mbarara district, Uganda**.** Structured interviews were performed following pre-test counselling. Three-hundred-eighty women were included in the study, 323 (85%) of whom accepted HIV testing.

In multivariate analysis, testing site (Site A OR=1.0, Site B OR=3.08, 95% CI 1.12-8.46, Site C OR=5.93, 95% CI 2.94-11.98), age between 30 and 34 years (<20 years OR=1.0, 20-24 years OR=1.81, 95% CI 0.58-5.67, 25-29 years OR=2.15, 95% CI 0.66-6.97, 30-34 years OR= 3.88, 95% CI 1.21-13.41), mistrust in reliability of the HIV test (OR=20.60, 95% CI 3.24-131.0) and not having been tested for HIV previously (OR=2.15, 95% CI 1.02-4.54) were associated with test refusal. Testing sites operating for longer durations had higher rates of acceptance. The most common reasons claimed for test refusal were: lack of access to antiretroviral therapy (ART) for HIV infected women (88%, n=57), a need to discuss with partner before decision (82%, n=57), and fear of partner's reaction (54%, n=57). Comparison

with previous periods showed that the acceptance rate increased with the duration of the program.

Our study identified risk factors for HIV test refusal among pregnant women in Uganda and common reasons for not accepting testing. These findings may suggest modifications and improvements in the performance of HIV testing in this and similar populations.

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Background

The absolute majority of the estimated 530 000 children who contracted HIV infection in 2006 were born in sub-Saharan Africa, and acquired their infection through mother-to-child transmission (MTCT) (UNAIDS, 2006). The overall risk of vertical HIV transmission ranges from 15 to 45% (De Cock et al., 2000). A major part of transmission occurs in association with labour and delivery (Kourtis et al., 2006). The risk of vertical transmission in labour and during delivery is dependent on various factors, one of the most important of which is the plasma HIV load of the mother (Mofensson et al., 1999, Weiser et al., 1994). This explains why HIV infection in children born to infected women can be prevented by reducing maternal viral load at the time of delivery.

By combining ART, elective caesarean section and exclusive formula feeding, the risk of transmission can be nearly eliminated (European collaborative study, 2005). However, these interventions are not easily applicable in resource-limited settings, in which MTCT is most common.

Several studies have assessed simplified strategies for PMTCT (reviewed by Kourtis et al., 2006). In the HIVNET 012 study, it was shown that a single-dose of nevirapine (sdNVP) given to the mother at the onset of labour followed by a single dose to the newborn reduced the risk of transmission by nearly 50%, as compared to zidovudine prophylaxis, in a breastfeeding population (Guay et al., 1999).

PMTCT programs using the sdNVP protocol have been introduced in several sub-Saharan countries. However, in many places uptake of HIV testing has been disappointingly low among pregnant women, who have hence not gotten access to available interventions to avert HIV infections in their infants (Temmerman et al., 2003, Stringer et al., 2003).

In 2002 a sdNVP-based PMTCT program, was introduced in the Mbarara district in south-western Uganda. Low rates of HIV test acceptance were soon recognized as a major obstacle to the program. The objective of the present study was to identify risk factors and reasons for test refusal among women attending antenatal clinics in this district.

Setting

The study was conducted in three antenatal clinics (ANC: s) in the Mbarara district. The largest clinic is located in urban Mbarara at Mbarara university teaching hospital (MUTH)

referred to as Site A in this study. The other two clinics, Bwizibwera (site B) and Kinoni (site C), are situated about 30 minutes by car from Mbarara in a semi-urban setting. Over one million people live in the Mbarara district, with the majority in rural areas (Population secretariat, Uganda, 2002).

A PMTCT program following the HIVNET 012 protocol was introduced in site A in June 2002, and later in site B (July 2003) and site C (January 2004). HIV testing is performed using voluntary confidential counselling and testing (VCCT) and rapid HIV tests. In site A and B, counselling is usually done in groups, while in site C midwives perform counselling individually. At the time of the study, the availability of ART in the district was extremely limited.

Between July and December 2004, 9458 pregnant women received pre-test counselling in the Mbarara district and 5619 (59%) of them accepted testing. The prevalence of HIV among women accepting testing was 10%. The mean acceptance rate for VCCT in the study sites A-C during this period was 70%.

Methods

Women attending ANC during a three-week period in February- March 2005 who had received pre-test counselling and who gave oral informed consent to participate were eligible for inclusion. We excluded women who declined to consent for participation in the study.

Participants were asked to participate and interviewed after having received pre-test counselling, using a structured questionnaire. The questionnaire was written in English and translated into Ruyankole, the local language spoken by most people in the district. Blood sampling for HIV testing was done following the interviews in women who accepted testing using rapid HIV testing. Test results were given at the same visit.

The questionnaire covered socio-economic and demographic factors, knowledge about MTCT and PMTCT, intention to accept HIV testing (we did not examine if the woman actually took the test or not), and reasons for test refusal in women who declined testing, using a number of fixed questions. Participants were also asked whether they would have been willing to receive sdNVP as part of a universal treatment program without prior HIV testing, and if access to ART as treatment for HIV infection would have affected their decision to refuse testing.

The interviews were conducted by a research assistant in site A and by the midwives performing VCCT in site B and C. The interviewers received training in how to complete the questionnaire prior to study initiation.

Characteristics of women accepting HIV testing were compared to those in the group who refused testing. Data were entered into a SPSS database. Factors associated with test refusal were identified using univariate binary logistic regression analysis. All associated factors were then subjected to binary logistic regression analysis with backward selection for multivariate analysis. P-values <0.05 were considered as significant.

Ethical approval was obtained from the research ethics committee at the Mbarara University of Science and Technology. Information from the participants was handled under code.

Results *(place table 1, 2 and 3 in the end of the "results" section)*

Out of 440 eligible women, 432 accepted to participate in the study. (Site A: 223, Site B: 87, Site C: 122), 380 of whom were included (A: 223, B: 38, C: 119). Fifty-two women were excluded due to incomplete data or data not collected according to the study protocol. Forty-nine of these were the first women consecutively interviewed at site B. They were excluded because the midwife conducting the interviews at site B initially only included women who were about to accept the test due to a misunderstanding of the study protocol.

Two-hundred-eight (93%) accepted testing at site A, 30 (79%) in site B and 85 (71%) in site C.

Baseline characteristics of the study population are presented in *table 1*. Most women were literate, married, Protestant, and aged between 20 and 29 years. P-values were calculated to detect differences in the population between the sites, using Kruskal-Wallis test for continuous or ordinal data and Pearson Chi-square for nominal data. Using a significance level of $p < 0.05$ there was a significant difference for civil status ($p < 0.001$), literacy ($p = 0.007$), parity ($p < 0.001$), number of children alive ($p < 0.001$) and length of pregnancy ($p = 0.001$) but no difference for age ($p = 0.069$) or religion ($p = 0.058$) between the three sites.

In univariate analysis age between 30-34, illiteracy, testing site, not believing that the HIV-test was reliable and not having been tested for HIV previously were associated with test refusal. After multivariate analysis, the association with illiteracy became non-significant (*table 2).* A linear relation between increasing age and test refusal was not detected (Mantel-Haenzel trend chi-square test; p=0.428).

Reasons given for test refusal among the 57 women who did not accept testing are presented in *table 3*. The most common reason for refusal was a wish to discuss testing issues with one's partner before deciding to take the test (82%, n=57). Few women stated that they refused testing due to concerns about confidentiality (16%), discrimination from the community (18%) or from health-care staff (14%).

Among 323 women who accepted HIV testing, 31% said that they would have been willing to receive sdNVP without prior testing. Of the 57 women who refused testing 26% replied that they would have accepted PMTCT without prior testing.

As many as 88% (n=57) of the women who refused to take the HIV test, claimed that they would have accepted testing if drugs for treatment of HIV infected women were available.

Discussion

In this study, performed in an urban and semi-urban population in Uganda, we found that testing site, age between 30 and 34, not believing in the reliability of the HIV test, and not having been tested for HIV previously, were independent risk factors for test refusal among women attending antenatal care. In agreement with our findings, a Tanzanian study identified

testing site as a risk factor for test refusal (Westheimer et al., 2004). Controversially, older age has been associated with both refusal (Westheimer et al., 2004) and increased uptake (Kowalczyk et al., 2002, Pignatelli et al., 2006) of HIV testing. Other factors that have been linked to test refusal are the number of earlier pregnancies (Pignatelli et al., 2006), educational level, marital and socio-economic status (Westheimer et al., 2004). This illustrates that several risk factors may contribute, and that their importance can vary in different settings.

The influence of testing site on acceptance rates in our study could have several explanations. In sites A and B, counselling was usually done in groups, while in site C midwives performed counselling individually. Previous studies have indicated that acceptance of testing increases with time spent during counselling (Sorin et al., 1996). The personal qualities, skills and experience of the counsellor are also likely to affect acceptance rates, and could explain the variations found between testing sites.

Another reason for the influence of testing site on acceptance rates might be the time that the PMTCT program has been functioning. We noticed that the acceptance rate at the different testing sites corresponded with the length of time that VCCT had been available (Site A with 93% acceptance rate, opened in June 2002, Site B with 79%, opened in July 2003 and Site C with 71% opened in January 2004). The mean test acceptance rate of these sites during our study period was 85%, compared to 70% in the last six months of 2004. In addition to experience gained by involved staff, knowledge and attitudes regarding HIV and PMTCT in the target community could change over time following introduction of a PMTCT program.

Comparison of baseline characteristics demonstrated several differences between the studied women in the three sites (Table 1). However, none of these differing characteristics were

found to be associated with test refusal in multivariate analysis. Yet, it remains possible that testing site could be a confounder for some other unmeasured parameter that was not assessed in this study.

The most common reasons stated for test refusal were the wish to discuss the issue with one's partner, and fear of the partner's reaction in case of a positive test result. The importance of the partner in the decision making regarding HIV testing has been demonstrated in several studies. An earlier study conducted in the Mbarara district found that women attending PMTCT programs who thought their husbands would approve of HIV testing were almost six times more likely to report a willingness to take an HIV test. (Bajunirwe et al., 2005). Qualitative studies conducted in Tanzania and Uganda have shown that fear of partner's reaction to a positive test result is an important factor in making a decision regarding HIV testing (Pool et al., 2001, Urassa et al., 2005).

Most HIV infected women in Africa are thought to have contracted their infection from their steady male partners (UNAIDS, 2007). Still, if the female partner is the first one to test positive, she may be suspected of having brought the infection into the family, which could lead to various adverse psycho-social consequences. Performing VCCT for couples simultaneously might be a way to avert such problems and a way to increase rates of HIV testing among men. The UNICEF has launched the "PMTCT plus" strategy in order to promote a family-based approach to HIV management in pregnant women (UNICEF, 2006).

Furthermore, the lack of effective therapy for HIV infection might contribute to test refusal. Interestingly, 88% of women who refused testing claimed that they would have accepted it if

affordable ART was available. Offering treatment to HIV positive mothers and other family members would probably increase the acceptance rate of HIV testing among pregnant women.

Universal therapy with sdNVP during delivery has been proposed as one way to address the problem of low ANC HIV testing rates in high-prevalence countries (Hashimoto et al., 2002). A study in northern Tanzania showed that almost 50% of pregnant women would prefer to receive such treatment without prior testing (Urassa et al., 2005), whereas similar figures in two Zambian studies were 25 and 40%, respectively (Sinkala et al., 2001, Stringer et al., 2004). In our cohort, only 30% of the participants were in favour of universal sdNVP. The benefit of such a strategy thus seems questionable, since a major proportion would not accept treatment without prior testing, and only a rather low proportion of women who refused testing would have been willing to receive such intervention if testing could be avoided.

Recently, the VCCT strategy for HIV testing has been challenged as being too complicated and resource consuming, a factor, which in itself could contribute to low testing rates. An "opt-out" strategy has been proposed instead of VCCT as a way to improve the coverage of PMTCT (Perez et al., 2006). We did not study whether such a procedure would have been more or less acceptable to the women in Mbarara. However, since many of the women who declined testing did so because they wished to discuss the issue with their partner before, we believe that an opt-out strategy would probably have given too little attention to the particular problems associated with HIV testing in pregnant women.

A limitation of our study was that the interviews were conducted by the same midwives who performed VCCT at two of the clinics. This may have influenced results, and precluded analysis of whether characteristics of the pre-test counselling received affected acceptance rates. Selection bias may have occurred since women who refused participation in the study

might also have refused HIV testing; however, only 8 of 440 women declined to participate. Forty-nine women interviewed at site B were excluded due to data not collected according to study-protocol. They were the first forty-nine consecutively interviewed so it is unlikely that this exclusion caused a selection bias.

In conclusion, we found that age between 30-34, mistrust in HIV testing, not having been tested previously, and testing site were independent risk factors for HIV test refusal. Rates of test acceptance increased with the duration of time that the intervention programs had been running, suggesting that initial low acceptance rates in PMTCT programs may improve over time. Our participants emphasized the importance of their partners in the decision-making and the access of ART for HIV infection in women in need of such therapy, pointing to other strategies that might contribute to improve rates of HIV testing among pregnant women in Africa.

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Table 1, 2 and 3 should be placed in the end of the "results" section

Table 1. Baseline characteristics of the study population. (n=380)

	Site A		Site B		Site C		Total		p-value
Age(years)									0.069
<20	40	18%	5	13%	12	10%	57	15%	
20-24	91	41%	14	37%	43	36%	148	39%	
25-29	56	25%	12	32%	34	29%	102	27%	
30-34	26	12%	5	13%	24	20%	55	14%	
>34	10	4%	2	5%	5	4%	17	4%	
Missing data	0	0%	0	0%	1	1%	1	0%	
Religion									0.058
Protestantism	115	52%	24	63%	71	60%	210	55%	
Catholicism	57	26%	12	32%	35	29%	104	27%	
Islam	39	17%	1	3%	9	8%	49	13%	
Other	11	5%	1	3%	4	3%	16	4%	
Missing data	1	0%	0	0%	0	0%	1	0%	
Civil status									<0.001
Single	20	9%	5	13%	3	3%	28	7%	
Partner, not living together	11	5%	5	13%	0	0%	16	4%	
Married (monogamous)	160	72%	23	61%	106	89%	289	76%	
Married (polygamous)	31	14%	5	13%	9	8%	45	12%	
Missing data	1	0%	0	0%	1	1%	2	1%	
Literacy									0.007
Literate	191	86%	32	84%	86	72%	309	81%	
Illiterate	32	14%	5	13%	33	28%	70	18%	
Missing data	0	0%	1	3%	0	0%	1	0%	
Parity									<0.001
Zero	78	35%	9	24%	19	16%	106	28%	
One- two	91	41%	14	37%	46	39%	151	40%	
More than two	54	24%	15	39%	54	45%	123	32%	
Missing data	0	0%	0	0%	0	0%	0	0%	
Children alive									<0.001
Zero	91	41%	9	24%	25	21%	125	33%	
One -two	85	38%	17	45%	51	43%	153	40%	
More than two	46	21%	12	32%	43	36%	101	27%	
Missing data	1	0%	0	0%	0	0%	1	0%	
Trimester									0.001
First	30	13%	7	18%	6	5%	43	11%	
Second	108	48%	21	55%	51	43%	180	47%	
Third	81	36%	10	26%	61	51%	152	40%	
Missing data	4	2%	0	0%	1	1%	5	1%	

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Table 2. Risk factors associated with HIV test refusal in univariate and multivariate analysis (adjusted for age, literacy, testing site, believing that the HIV test is reliable and being tested for HIV previously).

		Univariate analysis		**Multivariate analysis**	
		OR (95% CI)	p-value	OR (95% CI)	p-value
Age (years)	<20	1.0		1.0	
	20-24	1.72 (0.62-4.80)	0.30	1.81 (0.58-5.67)	0.31
	25-29	2.08 (0.72-5.98)	0.17	2.15 (0.66-6.97)	0.20
	30-34	3.55 (1.18-10.67)	0.024	3.88 (1.21-13.41)	0.032
	>34				0.998
Literacy	Yes	1.0		1.0	
	No	1.94 (1.01-3.7)	0.045	Not significant	
Testing site	Site A	1.0		1.0	
	Site B	3.70 (1.44-9.46)	0.006	3.08 (1.12-8.46)	0.029
	Site C	5.55 (2.87-10.71)	0.000	5.93 (2.94-11.98)	0.000
Believe that the HIV test is reliable	Yes	1.0		1.0	
	No	12.11 (2.16-67.79)	0.005	20.60 (3.24-131.0)	0.001
Tested for HIV previously	Yes	1.0		1.0	
	No	2.10 (1.07-4.13)	0.031	2.15 (1.02-4.54)	0.045

Table 3. Reasons for test refusal among the 57 women who refused to take the HIV test according to pre-defined questions.

	Yes (%)	No (%)	No answer (%)
Wish to discuss with partner before testing	82	18	0
Fear of partner's reaction in case of a positive test result	54	39	7
Unwillingness to know HIV-status?	55	45	0
Fear of other people's reaction in case of a positive test result	18	80	2
Fear of lacking confidentiality from clinic staff	16	82	2
Fear of not receiving adequate care in case of a positive test result	14	86	0
Lack of access to adequate treatment of HIV infection	88	12	0