

Mother-to-child transmission of HIV and its prevention: awareness and knowledge in Uganda and Tanzania



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ABSTRACT

Awareness and knowledge about HIV mother-to-child transmission (MTCT) and preventive measures in different population groups and health personnel were analysed in future intervention areas in western Uganda and south-western Tanzania. In Uganda, a total of 751 persons (440 clients of antenatal and outpatient clinics, 43 health workers, 239 villagers, 29 traditional birth attendants) and in Tanzania, 574 persons (410 clients, 49 health workers, 93 villagers, 18 traditional birth attendants) were interviewed. When given options, knowledge on transmission during pregnancy and delivery in women was 93% and 67% in Uganda and Tanzania respectively, and 86% and 78% for transmission during breastfeeding. In Uganda 59% of male interviewees did not believe that HIV is transmitted during breastfeeding. Expressed acceptance of HIV testing was above 90% in men and women in both countries, but only 10% of the clients in Uganda and 14% in Tanzania had been tested for HIV infection. Health workers' knowledge regarding MTCT was acceptable, while traditional birth attendants' knowledge on both MTCT and preventive measures was extremely poor. Recommendations on infant feeding were not compatible with WHO recommendations for HIV-infected women. If prevention of MTCT (PMTCT) interventions are to be accepted by the population and promoted by health personnel, thorough orientation and training are mandatory.

Keywords: PMTCT, HIV, awareness, knowledge, western Uganda, western Tanzania.

RÉSUMÉ

La prise de conscience et la connaissance de la transmission mère-enfant du VIH (MTCT) et les mesures préventives parmi les différents groupes de la population et le personnel de santé ont été analysées dans des régions de l'ouest de l'Ouganda et le sud-ouest de la Tanzanie où les interventions auront lieu dans l'avenir. En Ouganda, 751 personnes en tout (440 clients de centres médicaux prénatals et de services de consultation, 43 ouvriers de santé, 239 villageois, 29 préposés traditionnels de naissance) et en Tanzanie, 574 personnes (410 clients, 49 ouvriers de santé, 93 villageois et 18 préposés traditionnels de naissance) furent objet des entretiens. Lorsqu'on leur a donné des options au choix, la connaissance de la transmission pendant la grossesse et à la naissance chez les femmes était de 93% et 67% en Ouganda et en Tanzanie respectivement et de 86% et 78% pour la transmission à l'allaitement. En Ouganda, 59% des hommes interviewés ont eu du mal à croire que le virus peut être communiqué à l'enfant lors de l'allaitement. Plus de 90% des hommes et des femmes dans les deux pays ont exprimé une acceptation de dépistage du VIH. Cependant, seulement 10% de clients en Ouganda et 14% en Tanzanie ont fait le dépistage. La connaissance des ouvriers de santé concernant le MTCT était acceptable, tandis que la connaissance du MTCT et les mesures préventives chez les préposés traditionnels de naissance fut extrêmement faible. Les recommandations de l'allaitement de l'enfant n'étaient pas compatibles avec les recommandations de l'OMS pour des femmes infectées. Afin que les interventions PMTCT soient acceptées par la population et promues par le personnel de santé, une orientation et une formation approfondies sont obligatoires.

Mots clés : PMTCT, VIH, prise de conscience, connaissance, l'ouest de l'Ouganda, l'ouest de la Tanzanie.

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INTRODUCTION

In Africa, especially in the countries of eastern and southern Africa most severely affected by the HIV/AIDS epidemic, the transmission of HIV from mother to child (MTCT) during pregnancy, delivery and during the period of breastfeeding is by far the most common route of HIV infection in children (Newell, 1998). The estimated risk of infection is 5 - 10% during pregnancy, 10 - 20 % during labour and 10 - 20 % during breastfeeding (De Cock, Fowler, Mercier, de Vicenzi, Saba, Hoff, *et al.*, 2000).

Substantial reduction of MTCT of HIV can be achieved by combining antiretroviral treatment, elective caesarean section and avoidance of breastfeeding (Newell, 2003). WHO guidelines recommend avoidance of all breastfeeding, if acceptable, feasible, affordable, sustainable and safe; or, alternatively, exclusive breastfeeding during the first months of life, based on general health benefits to children of unknown status (WHO/UNAIDS/ UNICEF, 1998). However elective caesarean section and non-breastfeeding are often not safe or feasible in rural areas of most high-prevalence countries.

Many organisations have taken initiatives to reduce perinatal HIV transmission from mother to child (PMTCT programmes) in developing countries (Newell, 2001; UNICEF, 2001). The programmes embark on improving obstetric procedures, offer perinatal antiretroviral prophylaxis or antiretroviral treatment, and counsel on infant feeding options according to WHO guidelines. Most programmes are based on the use of intrapartum and neonatal single-dose nevirapine as antiretroviral prophylaxis (Guay, Musoke, Fleming, Beggenda, Allen, Nakabiito *et al.*, 1999). The uptake of PMTCT services in Africa has so far been rather low (Temmerman, Quaghebeur, Mwanjumba & Mandaliya, 2003). Furthermore, the cost-effectiveness of such programmes depends on the coverage rates. Many efforts are necessary before PMTCT services are known and accepted in the social environment (family and community) and supported by the formal health institutional environment.

With support from the German Agency for Technical Cooperation (GTZ), PMTCT programmes were introduced in peripheral areas of western Uganda and in the Mbeya region, south-western Tanzania in 2001. In Uganda, pilot PMTCT interventions had first been

introduced in 1998. At the time of the study, PMTCT services were offered in seven health units, of which three were in the capital and four in rural areas (WHO, 2002).

In Tanzania, pilot PMTCT services were started in the four referral hospitals of the country in 2001. HIV prevalence in antenatal clients was about 8% in the Ugandan intervention area and 15% in the Tanzanian intervention area. Since antenatal services are the entry point for PMTCT interventions it is important to note that most women in the areas (80% in Uganda and 90% in Tanzania) attend antenatal services at least once during a pregnancy, with 20% of deliveries in the Ugandan and 47% of deliveries in the Tanzanian intervention area being institutional. Most women give birth at home, many with the help of a traditional birth attendant.

The purpose of this study was to analyse the status of awareness and knowledge about HIV MTCT and preventive measures of transmission in different population groups and health staff of the future intervention areas, as part of the preparation for the implementation of PMTCT programmes. We considered this assessment necessary because it had become obvious that the realisation of a PMTCT intervention requires awareness and acceptance by the health personnel, by the target population and by the communities. Furthermore, the assessment helped to design adequate sensitisation measures for the general population, as well as training units for the health staff and community-based resource persons such as traditional birth attendants.

METHODS

Study area and study participants

The study was conducted from November 2001 to February 2002 in the districts of Kabarole, Kamwenge and Kyenjojo in western Uganda. The districts covered a population of about 1 million. In Tanzania, the assessment was carried out from January to March 2002 in the districts of Mbeya urban, Mbeya rural and Mbozi of Mbeya Region in the south-west of the country. The total population of the Mbeya Region was approximately 2 million.

In Uganda, a total of 751 participants were interviewed. Of these, 440 clients, 100 women each

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attending the antenatal clinics and 10 men each attending the outpatient clinics, were interviewed at the four prospective PMTCT intervention sites: Fort Portal District Hospital, Virika Mission Hospital (Kabarole District), Rukunyu Health Centre (Kamwenge District) and Kyenjojo Health Centre (Kyenjojo District). In addition, 159 women and 80 men as well as 29 traditional birth attendants were interviewed in eight rural villages (Bujabara, Kicuna, Kibimba, Kabale, Masaka, Kyabyakwaga, Kisansa, Kigunda) of the districts. These villages were randomly selected from a list of all villages of each district. In the centre of the selected villages a bottle was turned and consecutive houses visited following the direction of the bottle opening. Furthermore, 43 health workers were interviewed, preferentially staff of antenatal clinics (ANCs) and mother-child health (MCH) clinics and of maternity wards in the hospitals, while in the health centres of the sites and villages any health worker was chosen. Participants at Fort Portal and Virika Hospital were categorised as urban, participants at Rukunyu and Kyenjojo Health Centres as semi-urban and participants in the villages as rural interviewees.

In Tanzania, a total of 574 interviews were held. Of these, 410 clients, 212 women attending the antenatal clinics and 198 males attending the outpatient clinics were interviewed at the four prospective PMTCT intervention sites: Mbeya Referral Hospital (Mbeya Urban District), Vwawa District Hospital (Mbozi District), Ruanda Health Centre and Igawilo Health Centre (Mbeya Urban District). In addition, 93 villagers (42 women and 51 males) and 18 traditional birth attendants were interviewed in four randomly selected rural villages Hanseketwa, Maganjo, Ndolezi and Idiga Songwe of Mbeya rural and Mbozi Districts. Also, 49 health workers were interviewed at the four sites as well as in the villages. Random selection of two villages each of Mbeya rural and Mbozi districts and selection of interviewees was done as described for Uganda. Participants at Mbeya Referral Hospital and Ruanda Health Centre located in the centre of Mbeya were categorised as urban, participants at Igawilo Health Centre situated at a distance of 20 km from the centre of Mbeya and at Vwawa Hospital were categorised as semi-urban, whereas participants in the villages were categorised as rural interviewees.

The study proposals were reviewed and approved by the Ugandan district and Tanzanian regional health authorities of the respective Ministries of Health.

Questionnaire

A standardised questionnaire was developed for female clients of antenatal services, for male clients of outpatient clinics and community members, for health personnel and for traditional birth attendants (TBAs). Open-ended and closed questions on HIV transmission and preventive measures were used in order to assess the 'active' knowledge of the interviewees, which is of special relevance for example for health workers engaged in HIV counselling. Local authorities were informed about the purpose of the study and authorisation was obtained. The questionnaires were pre-tested over 3 days and adjustments made according to local expressions. Interviews were conducted in the local language Rutooro in Uganda and in the national language Kiswahili in Tanzania.

Data analysis

Data were checked and entered using the EPI-Info programme version 6. Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 11.0. The chi-square test was used to compare groups. All tests were two-tailed.

RESULTS

Since the results of the interviews differ between the two countries, they are presented separately for Uganda and Tanzania.

Uganda

Respondents

Demographic characteristics of interviewed health unit clients and villagers (Table 1)

The majority of male and female clients were married (82% and 85%, respectively). In the age group 14 - 25 years 46% were primigravidae, while in the age group 26 - 35 years and above 35 years, 60% and 92%, respectively, had been pregnant more than four times. Women interviewed in the villages were significantly older ($p < 0.001$) and had a lower educational level ($p < 0.001$) compared with those interviewed in the

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TABLE 1. CHARACTERISTICS OF INTERVIEWED CLIENTS AND VILLAGERS (%)

	Uganda		Tanzania	
	Female	Male	Female	Male
Interviewed clients	559	120	254	249
Mean age (years)	24	30	23	32
Education				
No schooling	128 (22.9)	7 (5.8)	41 (15.8)	7 (2.8)
Primary school	359 (64.2)	70 (58.3)	184 (71.0)	186 (74.7)
Secondary school	72 (12.9)*	43 (35.8)*	34 (13.1)†	56 (22.5)†
Occupation				
Farmer	446 (79.8)	76 (63.3)	215 (83.0)	153 (61.4)
Other occupation	113 (20.2)*	44 (36.7)*	45 (17.0)*	96 (38.6)*
Residence				
Urban	200 (35.8)	20 (16.7)	108 (41.7)	107 (43.0)
Semi-urban	200 (35.8)	20 (16.7)	110 (42.5)	91 (26.5)
Village	159 (28.4)	80 (66.7)	41 (15.8)	51 (20.5)

* $p < 0.001$.

† $p < 0.01$.

urban and semi-urban health facilities and had had significantly more pregnancies compared with women living in urban and semi-urban areas ($p < 0.001$). An equal number of women were interviewed in the urban, semi-urban and rural areas.

Professional background of health workers and TBAs

All 43 health workers approached participated in the study: 55% of the health workers were interviewed in urban health institutions and 45% in institutions situated in semi-urban areas. Health workers were clinical officers (6), registered or enrolled nurses (10), assistant nurses (7), midwives (16) and others (4). The median work experience was 9 years. Fifteen (35%) of the health workers had attended training courses for HIV counselling and 10 of these were actually working as counsellors. Twenty-nine TBAs were interviewed. The majority (76%) had acquired their knowledge about antenatal and delivery care from their mother or other relatives; half of them had received additional training through programmes of the Ministry of Health; 86% reported to assist 1 - 5 deliveries per month, the remaining 14% attended 5 - 10 deliveries per month. Two-thirds of the TBAs (66%) reported that they had their first contact with the women during pregnancy, and only one-third attended their client only for delivery. The regular usage of gloves in order to protect themselves was reported by 59% of the TBAs. Only one TBA explained that she used cord clamps on a regular basis. While only 21% of the interviewees reported to have

regular contact with a health unit and to report the deliveries, referral of pregnant women to a health institution when expecting complications during pregnancy or delivery was common (83%).

Results of the interviews

Knowledge about HIV transmission of health unit clients and villagers

Nearly all women were aware that sexual intercourse is a route of HIV transmission. Only 6 women (all multipara) mentioned MTCT of HIV. When probed by closed questions, two-thirds of the interviewees expressed the opinion that MTCT was possible; however a high proportion of women disagreed or gave 'don't know' responses. In the rural area compared with the other areas more women believed that MTCT was possible (72% v. 65%); however the difference was not statistically significant. More than 40% of the interviewees rejected the possibility that HIV could be transmitted by breastfeeding, or admitted that they did not know.

When asked to enumerate means of preventing HIV infection, women named the use of condoms (58%), faithfulness (49%) and abstinence (32%). The majority of female interviewees had heard about the possibility of being tested for HIV (93%); however only half of the women could name a place where it was possible to be tested. When asked if they would agree to be tested now, the majority of women answered positively (91%). Yet only 10% of the interviewees claimed that they had been tested. Fear and lack of treatment were the most often mentioned reasons for not being HIV tested.

Similarly to the interviewed women, the most frequently spontaneously mentioned routes of transmission of HIV named by men were sexual intercourse (94%) and blood/sharp instruments (32%). Only 13% of the men mentioned MTCT (Table 2). The awareness of HIV transmission from mother to child in men was significantly higher compared with women (13% v. 1%; $p < 0.001$). Also, men living in villages named this route of transmission significantly more often compared with interviewees from other areas (19% v. 3%, $p < 0.05$), whereas the frequency of naming other routes of transmission did not differ with regard to residence. When presented with different ways of transmission, most men affirmed that

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TABLE 2. KNOWLEDGE OF WOMEN AND MEN ABOUT HIV TRANSMISSION IN UGANDA (%)

	Yes	No	Don't know
Women			
Sexual intercourse	537 (96.1)	6 (1.1)	16 (2.9)
MTCT	375 (67.1)	50 (8.9)	134 (24.0)
Breastfeeding	332 (59.4)	92 (16.5)	135 (24.2)
Men			
Sexual intercourse	118 (98.3)	2 (1.7)	0 (0)
MTCT	94 (78.3)	25 (20.8)	1 (0.8)
Breastfeeding	49 (40.8)	71 (59.2)	0 (0)

transmission through sexual intercourse, blood/sharp instruments and MTCT were possible; however more than half of the men regarded MTCT by breastfeeding as unlikely (Table 2).

When asked if they would agree to HIV testing of their wives the majority of men answered positively. The most frequent reason given for refusal was the fact that treatment was not available; however only two-thirds of men would agree to replacement feeding. Reasons given for the disapproving attitude were 'harmful for child', 'expensive', 'lot of people want to make business'. Most men would agree to be tested (92%); however only 10% of the interviewed men had ever been tested for HIV infection.

Knowledge of health workers and TBAs about MTCT of HIV

All health workers were aware about the transmission of HIV from mother to child. Transmission during delivery was spontaneously mentioned by 91% of the health workers, although transmission through breastfeeding by only 40%. Given different options,

health workers recognised that HIV may be transmitted during delivery and breastfeeding; however 33% of the interviewees did not believe or did not know that transmission could also occur during pregnancy.

Two-thirds of the TBAs (66%) were aware that HIV could be transmitted from mother to child. Asked to name different modes of MTCT, delivery was mentioned most frequently (68%). For the closed questions on transmission modes, half of the TBAs answered that they did not believe in transmission by breastfeeding or they responded with 'don't know' (Table 3).

Knowledge of health workers and TBAs about preventive measures

Prevention of MTCT was thought to be possible by 79% of the health workers in Uganda. However asked how to prevent transmission, less than one-third of the interviewees could spontaneously name any measure. Even when given several options, one-third of the health workers were not aware of prevention of MTCT by drugs. Prevention of HIV in general was thought to be possible by 38% of the TBAs. Only two TBAs spontaneously mentioned drugs, and one TBA mentioned avoidance of breastfeeding as a measure to reduce transmission. When probed, 50% of the TBAs considered avoidance of breastfeeding as a method to prevent transmission from mother to child. The TBAs recommended breastfeeding a child for at least 12 months. Furthermore, TBAs thought that solid nutrients should be introduced at the age of 6 months and liquid nutrients at the age of 3 months.

TABLE 3. KNOWLEDGE OF HEALTH WORKERS AND TBAS ABOUT MTCT OF HIV AND PREVENTION IN UGANDA (%)

	Health workers (N = 43)			TBAs (N = 29)		
	Yes	No	Don't know	Yes	No	Don't know
Route of transmission						
Pregnancy	29 (67.4)	7 (16.3)	7 (16.3)	14 (73.7)	3 (15.8)	2 (6.9)
Delivery	43 (100)	0 (0)	0 (0)	17 (89.5)	1 (5.3)	1 (5.3)
Breastfeeding	36 (83.7)	3 (7.0)	4 (9.3)	9 (47.4)	5 (26.3)	5 (26.3)
Mode of prevention						
Caesarean section	19 (44.2)	11 (25.6)	13 (30.2)	7 (63.6)	1 (9.1)	3 (27.3)
Drugs	31 (72.5)	5 (11.6)	7 (16.3)	7 (63.6)	1 (9.1)	3 (27.3)
Avoid breastfeeding	35 (81.4)	4 (9.3)	4 (9.3)	5 (45.5)	3 (27.3)	3 (27.3)

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Tanzania

Respondents

Demographic characteristics of the interviewees

Demographic characteristics of the interviewees are reflected in Table 1. Female interviewees were on average 10 years younger than male interviewees. Women and men participating in the study were mainly farmers with primary school level education; however significantly fewer men were farmers ($p < 0.001$). One-third of the women in the age group 14 - 25 years were primigravidae and in the age groups 26 - 35 years and above 35 years, 13% and 16%, respectively, had had more than 4 pregnancies. The age, educational level and number of pregnancies of women did not differ significantly with regard to residence.

Professional background of health workers and TBAs

All 49 health workers approached agreed to participate in the study: 41% of the health workers were interviewed in urban, 41% in semi-urban institutions and 18% were interviewed in dispensaries in villages. Health workers were clinical officers (9), registered and enrolled nurses (29), assistant nurses (3), midwives (5) and others (3). The median work experience was 17 years. Twelve Tanzanian health workers (25%) were trained as HIV counsellors. Half of the 18 TBAs interviewed had acquired their knowledge about antenatal and delivery care from their mother or other relatives, and 45% had received further training by a GTZ-supported project. The majority of the TBAs (89%) reported that they assisted 1 - 5 deliveries per month, the remaining attended 5 - 10 deliveries per month. Most of the TBAs stated that they attend their client only for delivery, and one-third reported that they had their first contact with the women during their pregnancy. Only 39% of the interviewed TBAs stated that they had regular contact with a health unit and reported the deliveries. However the majority (84%) reported that they usually referred pregnant women to a health institution when expecting a complicated pregnancy or delivery.

Results of the interviews

Knowledge about HIV transmission of health unit clients and villagers

The most frequent spontaneously mentioned routes of HIV transmission by female interviewees were sexual intercourse, blood and sharp instruments. The aware-

TABLE 4. KNOWLEDGE OF WOMEN AND MEN ABOUT HIV TRANSMISSION IN TANZANIA (%)

	Yes	No	Don't know
Women			
Sexual intercourse	257 (99.2)	1 (0.4)	1 (0.4)
MTCT	241 (93.1)	8 (3.1)	10 (3.9)
Breastfeeding	223 (86.1)	13 (5.0)	23 (8.9)
Men			
Sexual intercourse	247 (99.2)	2 (0.8)	0 (0)
MTCT	232 (93.2)	4 (1.6)	13 (5.2)
Breastfeeding	189 (75.9)	18 (7.2)	42 (16.9)

ness of MTCT transmission of HIV was low: only 1% of the interviewed women mentioned this route spontaneously. However, when offered different transmission modes most women were aware of MTCT and transmission through breastfeeding (Table 4). When asked to enumerate means to prevent infection, the use of condoms was most frequently mentioned (58%), followed by faithfulness (49%) and abstinence (32%). Nearly all women had heard about the possibility of being tested for HIV (93%) and could name a place where testing for HIV was offered (88%). The attitude towards HIV testing was mainly positive (92%), but only 14% of the interviewees had so far been tested. Fear and lack of treatment were the most often mentioned reasons for not being tested.

Similarly, the most frequent spontaneously mentioned routes of HIV transmission by men were sexual intercourse, sharp instruments and blood; none of the respondents spontaneously mentioned MTCT. Only when given different options did the majority of interviewees agree to the possibility of MTCT. However, uncertainty about transmission through breastfeeding was considerable (24% answered 'no' or 'don't know'). Most men would agree to the HIV testing of their wives. The most frequent reason given for refusal was the lack of treatment. HIV testing would be acceptable to 92% of men, although only 15% of the interviewed men had ever been tested for HIV infection.

Knowledge of health workers and TBAs about MTCT of HIV

The majority of the health workers were aware about the transmission of HIV from mother to child (Table 5). As modalities, HIV transmission associated with delivery, instruments, bruises and tears, mixing of blood, rupture of membrane and procedures such as cutting the cord and episiotomy were mentioned. As

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TABLE 5. KNOWLEDGE OF HEALTH WORKERS AND TBAS ABOUT MTCT OF HIV AND PREVENTION IN TANZANIA (%)

	Health workers (N = 49)			TBAs (N = 18)		
	Yes	No	Don't know	Yes	No	Don't know
Route of transmission						
Pregnancy	41 (83.7)	6 (12.2)	2 (4.1)	15 (83.3)	0 (0)	3 (16.7)
Delivery	48 (98.0)	0 (0)	1 (2.0)	11 (61.1)	3 (16.7)	4 (22.2)
Breastfeeding	46 (93.9)	2 (4.1)	2 (4.1)	10 (55.6)	3 (16.7)	5 (27.8)
Mode of prevention						
Caesarean section	19 (38.8)	26 (53.1)	4 (8.2)	1 (5.6)	9 (50.0)	8 (44.4)
Drugs	27 (55.1)	15 (30.6)	7 (14.3)	3 (16.7)	7 (38.9)	8 (44.4)
Avoid breastfeeding	36 (73.5)	10 (20.4)	3 (6.1)	4 (22.2)	5 (27.8)	9 (50.0)

many as 94% of the TBAs were aware that HIV could be transmitted from mother to child, the majority stating that transmission occurred during delivery. Only 6% of the TBAs spontaneously mentioned breastfeeding as a possible route. When probed, still only 56% believed that transmission through breastfeeding was possible.

Knowledge of health workers and TBAs about preventive measures

Prevention of MTCT was thought to be possible by 84% of the health workers in Tanzania. Asked how to prevent transmission, the most frequent spontaneously mentioned measure was the avoidance of breastfeeding. Probed with closed questions, avoidance of breastfeeding (74%) and administration of drugs (55%) were most often mentioned. Of the TBAs, only 20 agreed that any prevention was possible. Even when probed, less than a quarter of the Tanzanian TBAs believed that either caesarean section, drugs or avoidance of breastfeeding could reduce MTCT. Furthermore, TBAs recommended to breastfeed a child for at least 18 months, to introduce solid nutrients to the child at the age of 6 months and liquid nutrients at the age of 3 months.

DISCUSSION

Interventions such as PMTCT programmes can only be successfully implemented if communities understand the underlying problem and know about the existence and benefits of the services. The quality of advice-giving depends on the health workers' and counsellors' knowledge and training. Their perspectives, attitudes, beliefs and self-practice will considerably influence women's choices, and thus form the crucial link between policy and practice (de Paoli, Manongi & Klepp, 2002). We therefore thought that it

would be necessary to assess the levels of awareness and knowledge of MTCT and PMTCT in the beneficiaries and in the caregivers before starting a PMTCT intervention programme.

In Tanzanian women, knowledge about MTCT (93%) and about transmission through breastfeeding (86%) was higher than in Ugandan women (67% and 59%, respectively). Since no sensitisation activities had started, the reason for these differences in knowledge remains unknown. Knowledge in western Uganda was, however, still higher than knowledge reported from the Rakai District, Uganda, where among pregnant women visited at home, 40% affirmed that transmission during pregnancy may occur, 58% during delivery, and only 19% through breastfeeding (Kigozi, 2002).

In accordance with a report by Fylkesnes, Haworth, Rosenvärd and Kwapa (1999), expressed acceptance of HIV testing was found to be high (92%) in our study area. Voluntary counselling and testing (VCT) services had been introduced within the context of the HIV/AIDS control programmes in the two study areas in the late 80s. Therefore, availability and accessibility of counselling and testing could not have been major constraints. However, only 10% of the interviewed women and 14% of the interviewed men in both countries had undergone HIV testing at the time of interview. The misleading potential of measured initial intention of acceptance and willingness to be HIV-tested has been observed (Fylkesnes, *et al.*, 1999). Clearly, in test-dependent prevention programmes, as in our case, knowledge of HIV status is a prerequisite to be able to make use of the PMTCT services. Therefore, serious efforts to increase the acceptance of HIV testing need to be undertaken.

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With the exception of transmission through breastfeeding (42% in Uganda, 76% in Tanzania), overall knowledge of HIV transmission and MTCT in particular was not worse in men than in women. Surprisingly, in both countries male acceptance of HIV testing of the wife, use of an antiretroviral drug and, in Tanzania, acceptance of non-breastfeeding if possibly preventing HIV infection of the child were far above 90%. In Uganda, men were reluctant to accept non-breastfeeding (67%), the major reason being concerns regarding costs of alternative food and health of the child. When pregnant women in the Rakai District, Uganda, were asked to estimate their husbands' attitude, 46% thought that their husband would allow them not to breastfeed if it were a way of preventing MTCT (Kigozi, 2002).

Consequences of disclosure of HIV status have often been described and may include isolation, expulsion from the family and violence (Gaillard, Melis, Mwanyumba, Claeys, Muigai, Mandaliya *et al.*, 2002). In a Kenyan study, after discussing advantages and risks, only a third of 290 HIV-infected women included in a PMTCT study informed their partners. Ten per cent subsequently experienced violence or disruption of the relationship (Gaillard *et al.*, 2002). Likewise, women who are not breastfeeding fear being suspected of being HIV-infected, face stigma, isolation and risk of being thrown out of the community (WHO, 2002). With regard to the high male acceptance rate in our study, we wondered whether answers were given to please the interviewer or to prevent a suggestion of ignorance.

Knowledge of health workers about HIV transmission during pregnancy (67%) and through breastfeeding (84%) was low in the Ugandan setting. Furthermore, a clear need for specific training measures in both study areas became obvious with regard to preventive measures of MTCT. In this context it is important to differentiate between knowledge by 'recall', reflecting active knowledge, and 'recognition' of correct answers given to closed-ended options, reflecting passive knowledge. Only if a health worker actively recalls facts and information will he/she be in a position to transfer the messages and information to the client.

TBAs' knowledge about MTCT and preventive measures was very poor. Most women in peripheral

areas live too far from a health unit in which deliveries can be assisted, or cannot afford to give birth in an institution and therefore often rely on the assistance of TBAs. Furthermore, since 66% of the TBAs in Uganda and 33% of the Tanzanian TBAs had their first contact with the pregnant women during the antenatal phase they could play an important role as sources of information about PMTCT services for the women and their families, as well as refer the women to health units where PMTCT services are available.

In both countries, TBAs recommended breastfeeding women to introduce solid food at 6 months and liquids earlier, at 3 months in Tanzania and at 4 months in Uganda. These recommendations are not in accordance with the WHO infant feeding recommendation for HIV-infected mothers. In a recent study we found that at 4 months exclusive breastfeeding was practised by only 10% in the Ugandan and 19% in the Tanzanian intervention area (Poggensee, Schulze, Moneta, Mbezi, Baryomunsi & Harms, 2004). Women introduced liquids on average at 4 months in Uganda and 3 months in Tanzania, as found to be recommended by the interviewed TBAs. Common beliefs that 'water is necessary for quenching thirst' or that 'breastfeeding only will cause hard stools and water will prevent constipation' make it difficult to realise the international feeding recommendations (de Paoli *et al.*, 2002).

Our results show that overall knowledge and awareness of MTCT and preventive measures was present to a certain degree in the population of the study area. Knowledge of health workers showed considerable gaps, and was extremely poor in TBAs. TBAs and possibly other community-based resource persons have an important role to play in communicating messages and as a link between the social environment of the women and the health institution. Therefore not only health workers but also TBAs need to be trained regarding MTCT, PMTCT, infant feeding options and on issues regarding their own protection.

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