Intrapartum practices to limit vertical transmission of HIV

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The need to improve health services to HIV-positive women requires a specific focus on limiting mother-to-child transmission. Vertical transmission most often takes place during the intrapartum period; hence, it is essential to alert midwives to what constitutes safe or risky intrapartum practices. Midwives in the southern region of the North West Province of South Africa were surveyed for their knowledge of safe intrapartum practices that can limit vertical transmission of HIV, consequently indicating which intrapartum practices prevail in the region. We used a quantitative survey design and collected data by means of a questionnaire and checklist. A purposeful availability sample of 31 midwives who work in all four hospitals in the province was used and a random sample of 401 obstetric records was audited. Data were analysed by means of frequency analysis, effect sizes and cross-reference. A slight majority of the midwives had sufficient knowledge to distinguish between risky and safe practices. However, safe intrapartum practices are not always carried out and this raises concerns. Accordingly, we formulate general recommendations for nursing education, future research, and midwifery practice. In particular we suggest ways the national Guidelines for Maternity Care in South Africa may be adapted and better implemented to enhance safe intrapartum practices to limit vertical transmission of HIV.

Keywords: Africa, birth process, midwifery, mother-to-child transmission, nursing, occupational risks

Introduction

Approximately one-third of all women in the North West Province of South Africa are HIV-positive (Du Preez, 2002; Department of Health, 2003). Their vulnerability implies the need for health services that focus on reducing mother-to-child transmission of HIV, which is the prime cause of HIV infection among children (McIntyre & Gray, 1995; Woods, 1999). HIV-positive children have most often been infected during pregnancy, labour, childbirth or breastfeeding (McIntyre & Gray, 1995; Jenkins-Woelk, 1998). Without the necessary preventive measures, as many as 25–35% of the children of HIV-positive mothers will become infected (Department of Health, 2000), while most vertical transmission occurs during labour and the birth process.

In first-world countries, mothers have wide access to facilities that make informed decisions concerning antiretroviral therapy, and which adhere to birth methods that reduce the risk of vertical transmission of HIV. Theron (1999) emphasises that in developing countries it is mainly midwives who render primary obstetric services in the public sector. This is the case in the North West Province of South Africa where not all best options and facilities are available, and where midwives’ knowledge and skills are crucial to limit vertical transmission of HIV during the intrapartum period. It is vital that midwives have adequate knowledge of intrapartum practices and the risks of vertical transmission of HIV, and that they are able to distinguish between risky and safe practices to reduce risk. Midwives in the North West Province must especially be able to act as independent and safe practitioners since the province is extensively rural with no level-3 referral hospitals.

The strategic plan for South Africa 2000–2005 prioritised limiting vertical transmission of HIV from mother to child and emphasised the need for clinical guidelines to be used during the intrapartum period (Department of Health, 2002). It is also suggested that research be conducted regarding possible alternatives to help limit vertical transmission of HIV (Department of Health, 2002; Du Preez, 2004). The national Guidelines for Maternity Care in South Africa were first launched in 2000; this presented midwives with guidelines to limit vertical transmission of HIV, which were to be implemented in all hospitals by 2002 (Department of Health, 2002). While the North West Province has one of the highest levels of HIV prevalence in South Africa, the researcher, as a midwifery lecturer who also works in clinical settings, realised that the latest findings of worldwide research were not being implemented in the province, nor were the national guidelines for maternity care in South Africa being implemented in the province by 2003.

Our objectives were to determine whether midwives in the southern region of the North West Province have sufficient knowledge of intrapartum practices that can
reduce vertical transmission of HIV, and to determine the intrapartum practices prevalent in the region. Furthermore, we hoped to conclude how the national Guidelines for Maternity Care in South Africa may be adapted and better implemented in the region in order to reduce vertical transmission of HIV during the intrapartum period.

**Methodology**

A quantitative survey design was used. Data were simultaneously collected in two parts. As part one, questionnaires were used to determine the midwives’ knowledge of intrapartum practices to limit vertical transmission of HIV; as part two, a checklist was employed to determine the prevailing intrapartum practices in the study area. The questionnaires were based on current literature and submitted to research and subject specialists, and they were pre-tested before the study commenced. All four provincial hospitals in the southern region of the North West Province were included in the study.

Part one (the questionnaire) included a purposeful availability sample from the four provincial hospitals, as there are only four provincial hospitals in the region and the response to surveys is usually poor (Abramson, Abramson, 1999). Consequently, all midwives who work in the maternity wards in the region were drawn on; 31 (out of the possible 34 allocated) midwives with basic nursing training participated as respondents. During part two (the checklist), the past year’s obstetric records at the four hospitals were audited. In Hospital A (level-2 hospital), 100 obstetric records were audited; 50 in Hospital B (level-1); 50 in Hospital C (level-1); and 201 in Hospital D (level-2) (total 401 obstetric records). The province does not have a level-3 hospital in any region. The audits conducted at each hospital were calculated statistically according to the number of deliveries that occurred at these facilities per annum. (The information showed that approximately 800 vaginal deliveries are conducted per month in the southern region of the North West Province.) The first obstetric record was selected randomly, implying that each 20th obstetric record for the past year was audited, depending on the number of deliveries conducted at each institution. Four-hundred-and-one obstetric records were audited by means of a checklist, in order to obtain a statistical inference of 95%.

The completed questionnaires and checklists were analysed using SAS software (SAS Institute, 1999) and the statistical consultation services at North West University (Potchefstroom Campus). Descriptive statistics were used to generate proportions and p-values to determine if the differences were statistically significant. Data were analysed by means of a frequency analysis, effect sizes and cross-reference.

**Results**

**Midwives’ knowledge**

The results indicate that the midwives largely had sufficient knowledge of aspects of intrapartum practices that limit vertical transmission of HIV. For example:

- 84% were aware that HIV can be determined during labour by way of a Rapid Test. Although this is a fast, accurate and economic method (Woods, 1999), no provincial hospital in the southern region of the North West Province had a Rapid Test in stock at the time of our data collection.
- 81% knew that membranes should only be ruptured if there is a clinical reason for doing so, as it leaves the foetus unprotected from vaginal and cervical secretions for a longer period (Woods, 1999). The rupture of membranes is a controversial topic in midwifery practice; research shows that membrane rupture plays an increasing roll in vertical transmission of HIV if rupture occurs more than four hours prior to delivery (Department of Health, 2002).
- 55% knew that preterm labour doubles the risk of vertical transmission. This probably happens because the baby’s immune system is not fully developed and fewer antibodies are present (Woods, 1999).
- 55% knew that a shorter second stage of labour limits vertical transmission. If the second stage of labour is relatively long, the baby is exposed to the mother’s blood and secretions, thereby increasing risk of vertical transmission (Woods, 1999).
- 55% were familiar with an increased risk of vertical transmission if a pregnant woman has clinical signs of AIDS, as her CD4 cell count will be low and her viral load high (Van Dyk, 2001).
- 81% were of the opinion that elective caesarean section reduces the risk of vertical transmission, since the neonate is not exposed to maternal cervical and vaginal secretions.

Nevertheless, responses on the questionnaires and checklists showed some uncertainty among the midwives about what constitutes safe intrapartum practices in regard to vertical transmission. For example:

- **The risk of vertical transmission during labour and birth:** Only 10% of the midwives correctly understood that without the necessary preventive measures, the risk of vertical transmission during labour and birth is approximately 25–35% (Department of Health, 2002); 45% believed that the risk was as high as 50%.
- **The timing of a mother’s HIV infection in relation to risk of vertical transmission:** Only 6.45% understood that a child faces the highest risk of HIV infection if the mother had become infected with HIV during the first trimester of pregnancy (Jenkins-Woelk, 1998; Krist & Crawford-Faucher, 2002).
- **The effect of HIV on preterm labour:** 35% correctly understood that HIV infection in a pregnant woman doubles the risk of preterm labour (Woods, 1999) and the remaining 65% answered inaccurately.
- **Prolonged rupture of membranes:** 30% understood that membranes ruptured more than four hours prior to delivery increases the risk of vertical transmission of HIV (Landesman, Kalish & Burns, 1996; Kuhn, Abrams, Matheson & Thomas, 1997; Woods, 1999).
- **Effect of scalp electrodes or scalp blood sampling:** 55% were uncertain about the HIV risk effect of scalp electrodes. A possible explanation is that interventions using scalp electrodes or scalp blood sampling are not practised in the region.
• **Multiple deliveries and increased risk for vertical transmission:** 68% were uncertain as to which baby in a set of twins or triplets runs the highest risk of acquiring HIV infection during birth. A possible explanation for their uncertainty is that most multiple births are delivered through caesarean section.  

• **The benefit of vaginal swabbing:** 51% did not know that vaginal swabbing is a relatively cheap method to decrease chance of vertical transmission of HIV (Biggar, Miotti, Taha, Mitmavalye, Broadhead, Justesen, Yellin, Liomba, Mile, Waters, Chipangwi, & Goedert, 1996; Department of Health, 2002). However, this is presently not an option in the region.  

• **The best birth option for developing countries:** In developing countries such as South Africa, vaginal delivery with the necessary preventive measures seems to be the best and most-affordable option, since caesarean sections are impractical and expensive (Gelber & Shapiro, 1999; Mwanyumba, Gaillard, Inion, Verhofstede, Claeyens, Chonan, Vansteelandt, Mandaliya, Praet & Temmerman, 2002; Moodley, Moodley, Coovadia, Gray, McIntyre, Hofmyer, Nikodem, Hall, Gigliotti, Robinson, Boshoff & Sullivan, 2003). Only 17% of the midwives selected vaginal deliveries as the best birth option. The majority (56%) selected elective caesarean sections as the best, while 10% selected bloodless caesarean sections. The remaining 17% were uncertain about the best birth option.  

• **The value of antiretroviral therapy:** It is widely accepted that antiretroviral therapy has great value. However, 58% of the midwives did not understand that the risk of vertical transmission may be reduced by 50% with the use of antiretroviral medication (in this case Nevirapine). Five options were given regarding potential percentage of reduction in vertical transmission of HIV through use of antiretroviral therapy: 21% of the midwives selected 10% potential reduction; 17% selected 20% reduction; 10% selected 50% reduction; 10% selected 80% reduction; 45% selected the fifth option which indicated they were unsure about the potential percent reduction (Figure 1).

### Demographic data of the patients

In the audited case records, 52% of the pregnant women were 20–29 years old, and 20% were under age 20. The youngest patient was age 14 and the oldest was age 54. Interesting findings involving patient demographics included:  

• 91% of patients whose records we audited belonged to the same culture group as the midwives who rendered obstetric services. Although it was not the focus of the research, we surmise that these midwives in the southern region of the North West Province know of cultural habits that may influence mother/child health during the intrapartum period. This circumstance has potential for creating trusting relationships between pregnant women and midwives.  

• 94% of the pregnant women were not aware of their HIV status. From this statistic we can only conclude that the test results of pregnant women who undergo HIV testing and counselling are, sadly, not always related back to them. Furthermore, the test results are not reliably recorded on antenatal clinic cards. The Nevirapine registry revealed that only 1% of the pregnant women (with known HIV status) had received Nevirapine. Obviously, HIV testing during pregnancy should receive more attention at clinics and hospitals. If a pregnant woman does not know her HIV status an opportunity is missed to provide her with health education and to give her an antiretroviral drug.  

• Midwives had conducted 68% of the deliveries. Because midwives allocated to obstetric units act as role models for student-midwives, safe and risky intrapartum practices are thus established, implemented and reinforced.

#### Intrapartum practices in the study area

An important goal of the audit was to determine which intrapartum practices are prevalent in the southern region of the North West Province and to recommend guidelines for practices that limit vertical transmission of HIV. According to our sample of maternity records, safe intrapartum practices occurring with regard to mothers involved the following:  

• For most mothers the first, second and third stages of labour occur within the guidelines indicated in the literature. McCoy, Besser, Visser & Doherty (2002) emphasise that it is mainly a prolonged second stage that increases risk of vertical transmission of HIV. Also, since the third stage of labour is associated with blood loss, a shortened third stage will contribute to decreased blood loss. As the stages of labour during most deliveries are taking place within the set guidelines, it can be concluded that midwives play an important role, and, in this regard, that safe intrapartum practices are generally conducted.  

• Blood loss occurs within normal ranges. Even minimal blood loss can be fatal for a mother who has a low haemoglobin level and is immune compromised as a result of HIV. Although blood loss is a subjective observation, it can be concluded that safe intrapartum practices should include managing for minimum blood loss.  

• The membranes of two-thirds of the patients had ruptured spontaneously. Thus it seems that midwives are generally aware of the recommendation that pregnant women should be allowed the spontaneous rupture of membranes. It is of concern however that

![Figure 1: Midwives' responses regarding the potential percent reduction in vertical transmission through the use of antiretroviral therapy](image-url)
one-third of the pregnant women in the sample had experienced the artificial rupture of membranes.

Safe intrapartum practices occurring with regard to neonates included the finding that the majority (about 74%) did not receive gastric lavage. A possible explanation for this is that the obstetric units do not have the equipment required for the procedure, hence neonates that need gastric lavage are referred to the intensive care unit; however, if it is performed there, it is not routinely indicated on the obstetric record.

Risky intrapartum practices occurring in the study area with regard to the mother involved the following:

- **Maternal trauma** — Of the records we sampled, only one-third of all vaginal deliveries involved no maternal trauma. Since maternal trauma leads to an increased risk of vertical transmission (Department of Health, 2002) we can infer that two-thirds of the vaginal deliveries conducted in this region had an increased risk of vertical transmission of HIV. (Table 1 indicates the different types of deliveries that occurred in the region.) Maternal traumas noted on the records included episiotomies or assisted deliveries. We divided trauma to the mothers into eight categories, as indicated by the frequency analysis in Table 2. Of 401 deliveries, 127 mothers experienced a delivery without any physical trauma, representing 31.67% of the sample; records for 1.25% mothers do not record the occurrence or absence of trauma; and the remaining 67.08% of the mothers experienced trauma as indicated in Table 2.

- **Lack of antiretroviral therapy for mothers** — Although HIV prevalence in the region is high (Department of Health, 2003), antiretroviral therapy was not given to all HIV-positive mothers as recommended by the national guidelines (Department of Health, 2002). It appears that the main reason for this is that midwives do not know the HIV status of most mothers. In order to benefit from the PMTCT programme, the mother’s HIV status must be known. The attending midwives were aware of a woman’s HIV status in the case of only 23 of 401 patients whose records we audited (6% of the sample). The HIV status of the remaining 94% of the women in the sample was unknown. According to the obstetric records, merely one patient had received antiretroviral medication (Nevirapine). Fifteen patients whose HIV status was known were HIV-negative, representing 3.75% of the sample; 71% of the patients with unknown status did not receive Nevirapine; and, in the case of the remaining 25%, it had not been recorded whether they had received Nevirapine.

- **Artificial rupture of membranes** — A double layer of membranes (the amnion and chorion) protect the foetus from infection as long as the membranes are intact; when the membranes rupture, either spontaneously or artificially, this protection no longer exists. Research conducted by Landesman et al. (1996) and Kuhn et al. (1997) stipulate that the risk of vertical transmission of HIV is increased if the membranes have been ruptured for longer than four hours. The audited obstetric records showed that one-third of mothers had experienced artificial rupturing during the intrapartum period, even though by doing so a midwife can increase the chance of vertical transmission of HIV.

The more common risky intrapartum practices occurring with regard to the neonate were:

- **Suctioning the mucus membranes** — The national guidelines emphasise that routine suctioning of the mucus membranes directly after birth must be avoided because vigorous suctioning may damage the membranes, which increases the risk of vertical transmission. The audited obstetric records showed that 67% of the neonates had been suctioned at birth. Suctioning without a clinical reason must be discouraged.

- **Lack of antiretroviral therapy for the neonate** — The audited records showed that no neonates had received Nevirapine. This led us to check the Nevirapine register which showed that roughly 1% of neonates had indeed received Nevirapine. A neonate should receive Nevirapine within 72 hours after birth, yet most mothers are discharged from hospital within 6 to 12 hours after delivery. Again, it is vital to know a mother’s HIV status if she and her infant are to become part of the PMTCT programme.

**Discussion**

Midwives who have sufficient knowledge regarding vertical transmission of HIV can play an important role in limiting it, while faulty knowledge can lead to risky intrapartum practices. According to national statistics, the North West Province has the fifth-highest level of HIV prevalence among pregnant women (Department of Health, 2003). Controversially, findings by the Health System Trust indicate that the province also has the lowest rate of HIV antenatal testing, at 27% (Chopra, Jackson, Ashworth & Doherty, 2004). This may explain why so few pregnant women are aware of their HIV

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**Table 1:** Types of delivery (n = 401 birth records from North West Province, South Africa)

<table>
<thead>
<tr>
<th>Conductor</th>
<th>Percentage</th>
<th>Cumulative percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal vaginal delivery (NVD) with trauma to the mother: episiotomy</td>
<td>31.66</td>
<td>31.66</td>
</tr>
<tr>
<td>NVD with trauma to the mother: tear</td>
<td>32.91</td>
<td>64.57</td>
</tr>
<tr>
<td>NVD without consecutive trauma to the mother (i.e. no episiotomy and/or tear)</td>
<td>30.9</td>
<td>95.48</td>
</tr>
<tr>
<td>Wrigley’s extraction</td>
<td>0.25</td>
<td>95.73</td>
</tr>
<tr>
<td>Vacuumed extraction</td>
<td>2.51</td>
<td>98.24</td>
</tr>
<tr>
<td>Failed vacuumed extraction with follow-up Wrigley’s extraction</td>
<td>0.5</td>
<td>98.74</td>
</tr>
<tr>
<td>Breech delivery</td>
<td>0.75</td>
<td>99.5</td>
</tr>
<tr>
<td>Not recorded</td>
<td>0.5</td>
<td>100</td>
</tr>
</tbody>
</table>
status during labour. Additionally, the South African Health Review (SAHR) compiled by Tint, Doherty, Nkonki, Witten & Chopra (2003) evaluated knowledge among counsellors and trainers and found theirs was also insufficient. This perpetuates pregnant women’s lack of awareness and raises substantial concerns: If the health workers who are supposed to impart knowledge, lack adequate knowledge, what information is transferred to pregnant women? Furthermore, many health workers lack knowledge about HIV testing and fail to realise its importance during pregnancy: in 94% of the audited cases in this study, the pregnant woman was unaware of her HIV status. Such a situation presents a dilemma to a midwife. Unaware of a woman’s HIV status, a midwife cannot provide that patient with options or education regarding her future reproductive health. Because a mother and newborn normally leave the hospital six hours after delivery, the midwife will be unable to provide them with timely antiretroviral therapy as part of the PMTCT programme if she is unaware of the patient’s HIV status. According to Chopra et al. (2004), 30% of mothers receive antiretroviral therapy nationally; the results here indicate the percentage is very low however in the North West Province. A mother’s HIV status will also affect her baby-feeding choice (see Tint et al., 2003). Such missed opportunities have detrimental consequences for intrapartum practices. Midwives can make a solid contribution towards limiting vertical transmission of HIV from mother to child. Recommendations that could address the gaps identified are discussed below.

Recommendations

Our study specifically aimed towards making a contribution to improving midwives’ knowledge of intrapartum practices to reduce the vertical transmission of HIV and so promote safe practices. Thus, we make recommendations for improving nursing education, research and practice, and we also suggest ways the South African national policy may be adapted and implemented in the North West Province.

Recommendations for nursing education

Midwives obtain their knowledge through basic formal education as well as through self-study education programmes (e.g. Perinatal Education Programme). We propose that important topics to be included in a midwifery curriculum are:

- Communication skills: These are essential since the midwife fulfils the role of counsellor, health educator, referral agent and patient advocate. Charmane & Kortenbout (1997) emphasise this.
- Sensitive counselling as part of HIV testing: The education of midwives as counsellors needs to be prioritised. It is important that a trustworthy relationship is developed between the pregnant woman and the midwife. If the midwife acts as a sensitive HIV counselor, she would not need to refer the pregnant women to another party for pre-test counselling.
- Subject-specific knowledge regarding vertical transmission of HIV, with specific emphasis on risky intrapartum practices and establishing safe ones: Midwifery lecturers as well as registered midwives who work in an obstetrics unit must implement safe intrapartum practices and thus become role models. Thus, they must have sufficient knowledge of current research and evidence-based practices. The learner must be motivated to commit to lifelong learning through attending workshops, symposia and in-service training. She/he should also stay informed of the latest research concerning intrapartum practices.

Recommendations for post-basic education

An advanced midwife plays a leading role in the midwifery practice; thus, as a role model for other midwives, she must have excellent subject-specific knowledge. She should be knowledgeable on the latest relevant research in midwifery and neonatology nursing science. For instance:

- Aspects concerning intrapartum practices to limit vertical transmission should be included in the curriculum for Advanced Midwifery and Neonatal Nursing Science.
- A climate should be established for life-long learning and motivation, through professional offers to attend workshops, symposia and conferences. They should be motivated to keep up-to-date with available literature in research journals and via the internet.
- Advanced midwives could be included in research projects that are conducted at specific hospitals. When they implement new knowledge, they play a valuable role in improving midwifery practices in general.
- Not all midwives are able to complete an additional qualification in Advanced Midwifery and Neonatal Nursing Science, but it is recommended that frequent in-service training be conducted to discuss relevant research issues. A relatively cheap and effective way to expand midwives’ knowledge regarding HIV is to motivate them to follow the Perinatal Education Programme (PEP, regularly updated). In so doing, each midwife can complete the programme within her own specific limits and time constraints. It is also advisable that hospital administrators acknowledge midwives who have completed a PEP qualification.
- We recommend that all midwives in the North West Province complete the clinical training course in PMTCT and Infant Feeding and Counselling, offered as a five-day course conducted by the Department of Health. Midwives at a given location could complete this course on a rotation basis, after which they will receive a certificate of attendance.

Recommendations for future research

Following the outcomes of this study we propose several possibilities for future research:

Table 2: Variety of physical traumas sustained by mothers (n = 401 birth records from North West Province, South Africa)

<table>
<thead>
<tr>
<th>Conductor Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Episiotomy</td>
<td>133</td>
</tr>
<tr>
<td>First-degree tear</td>
<td>113</td>
</tr>
<tr>
<td>Second-degree tear</td>
<td>14</td>
</tr>
<tr>
<td>Third-degree tear</td>
<td>2</td>
</tr>
<tr>
<td>Episiotomy and tear</td>
<td>3</td>
</tr>
<tr>
<td>Not recorded</td>
<td>5</td>
</tr>
<tr>
<td>Intact</td>
<td>127</td>
</tr>
<tr>
<td>Vaginal lacerations</td>
<td>4</td>
</tr>
</tbody>
</table>
• An evaluation of the curriculum contents of different educational institutions regarding information about vertical transmission of HIV.
• Consideration of the factors that influence HIV testing for pregnant women.
• Study of the relationship between low haemoglobin values and being HIV-positive, in the context of safe intrapartum practices.
• An audit to determine the existing standards of nursing in obstetrics units, especially to improve the quality of midwifery.
• Qualitative research to establish perceptions among pregnant women about the quality of midwifery services.
• Exploration of cultural practices encountered during pregnancy that may influence intrapartum practices.
• Follow-up research in the study area after guidelines for safe intrapartum practices have been implemented, to determine changes in midwives’ knowledge and practices.

**Recommendations for current nursing practice**

We formulate suggestions as to how the national Guidelines for Maternity Care in South Africa (Department of Health, 2002) could be adapted and better implemented in order to limit vertical transmission of HIV.

**Guidelines regarding in-service training**

Since research is dynamic, midwives must stay abreast of the latest research findings and should be able to implement new knowledge in their midwifery practice, particularly practices to limit vertical transmission of HIV. In-service training is an informal method of presenting the latest research to midwives.

• A structured in-service roster with training scheduled every two weeks could be developed at the beginning of each year. The midwife with the highest qualification (for example, a midwife with an additional qualification in advanced midwifery and neonatal nursing science) could present the in-service training. An individual with good communication skills as well as appropriate knowledge should be allocated to this portfolio.

• Midwives must be encouraged to read research journals and conduct Web searches on specific topics, and they could present this information to other personnel. Small incentives can be used, for example displaying their photo, or alternatively the individual who presents the most interesting topic could receive an afternoon off as remuneration, provided it suits the obstetric unit.

• A formal ward round can be conducted each morning under a doctor’s supervision. Midwives and student midwives could participate and gain new experience and information. Midwives and nurses could be allocated a mark for each unit round they have completed, and each should strive to obtain a target amount of marks by the end of each year. These marks could be applied as a chance to conduct lectures or attend symposia, workshops or conferences.

• Symposia and workshops are an effective way to achieve professional knowledge without withdrawing too many personnel from the obstetrics unit. Knowledgeable persons can present subject-specific topics to the working midwives.

• All midwives should be encouraged to undergo the present programme regarding PMTCT and the perinatal self-education programme. This should be based specifically on the HIV/AIDS manual, since none of the midwives in this population have completed the course.

• All midwives should be enabled to qualify as HIV counsellors. Such a qualification would promote trusting relationships between midwife and patients and ultimately result in safer intrapartum practices. This would also eliminate additional referrals for HIV testing and counselling.

• Midwives should be involved in research projects to establish a culture of professional research and a climate for life-long learning.

• Printed guidelines that depict recommendations for safe intrapartum practices to limit vertical HIV transmission should be displayed in all obstetrics units.

**Motivating pregnant women to undergo HIV testing**

It is advised that pregnant women are assisted to become aware of their HIV status during the antenatal, intrapartum and puerperium period. This knowledge enables informed choices regarding practices that can influence HIV transmission. If the midwives know their clients’ HIV status, pregnant women stand to benefit. Together they can discuss options and possible solutions that would benefit the pregnant woman. Therefore, all pregnant women should be sensitively prompted to undergo HIV testing:

• A woman with a high-risk lifestyle should be encouraged to undergo HIV testing before the birth of her child, as her status could have changed since previous testing.

• Women with known HIV status should be encouraged to share this information with the midwife to ensure that she benefits optimally from the PMTCT programme.

• Pregnant women with unknown HIV status must be tested by means of the Rapid Test. This should be protocol in all units. The mother and the neonate can then receive Nevirapine, accordingly.

• Midwives should be trained to sensitively encourage pregnant women to undergo HIV testing. This procedure should include complete pre- and post-test counselling.

• A colour-code system on the patient’s Road-to-Health card can indicate her HIV status. To prevent potential discrimination in the community, stickers of different colours can be placed on the patient’s card, with the code’s explanation accessible to health workers only. If the midwife knows a patient’s HIV status, she is able to present the appropriate health education without having to probe the patient about her status.

**Health education as part of PMTCT**

If midwives and other health workers are familiar with their patients’ HIV status, more effective health education can be presented to patients before being discharged from an obstetrics unit.

• Since each individual has the right to privacy, it is advisable that a pregnant woman receives her health education in a one-on-one talk with her specific needs considered. This can circumvent stigmatisation that may occur when health education takes place in a group.
• Specific health education regarding prevention of mother-to-child transmission must be provided. This would include consideration for a client’s future reproductive life as well as a safe baby-feeding option.

Intrapartum practices that increase risk of vertical transmission of HIV

In order to implement safe intrapartum practices, it is necessary to distinguish between risky and safe intrapartum practices.

Practices that place mothers at risk

As far as possible, trauma to the mother must be avoided as it increases the risk of vertical transmission of HIV. Two common interventions are classified as maternal trauma:

Episiotomies — Routine episiotomies must be avoided. Episiotomies should only be performed when associated with a proven clinical reason (e.g. a prolonged second stage of labour) (Department of Health, 2002).

Artificial rupture of membranes — If the mucous membranes are ruptured longer than four hours prior to delivery, risk of vertical transmission is increased. The national guidelines suggest that the artificial rupturing of membranes must be avoided regardless of the patient’s HIV status. The time between rupture and delivery is to be kept as short as possible (Department of Health, 2002).

Practices that place neonates at risk

In turn, trauma to the neonate must be avoided, as it also increases risk of vertical transmission. Such trauma includes:

Internal scalp monitoring and blood sampling — These procedures can damage the neonate’s skin and so increase risk of vertical transmission of HIV.

Suctioning the neonate’s airways — Routine suctioning of the neonate’s airways should be avoided as it can injure the neonate’s membranes. It is suggested that suctioning be used only when there is meconium in the amnion fluid (Department of Health, 2002).

Intrapartum practices that limit vertical transmission of HIV

South Africa is a developing country with financial, knowledge and equipment constraints. In this context, the intrapartum practices of midwives can make a large contribution to limiting vertical transmission of HIV.

Safe intrapartum practices regarding the mother

Method of delivery — Normal vaginal deliveries are most recommended; due to expense and impracticalities associated with postpartum complications, pregnant women should not necessarily undergo caesareans to reduce risk of vertical transmission.

Vaginal lavage — Research has shown that vaginal lavage decreases the likelihood of vertical transmission, and may contribute to decreased maternal morbidity (Department of Health, 2002). It is therefore suggested that this relatively cheap and easy method be applied on all pregnant women regardless of their HIV status (Department of Health, 2002).

Safe intrapartum practices regarding the neonate

Removal of mucus — The routine vigorous suctioning of the neonate’s membranes may cause damage to the mucus membranes. This damage can increase the risk of vertical transmission. However, it is important that excess blood and secretions are removed by rubbing them off.

Suggested additions to the national Guidelines for Maternity Care in South Africa

The following are suggested additions to the existing national Guidelines for Maternity Care in South Africa; they should be implemented in obstetrics units as safe intrapartum practices with regard to mothers (see Box 1):

• Voluntary HIV testing — Testing for HIV can be expensive in an environment with financial constraints and many women do not have the opportunity to test before being admitted to an obstetrics unit. Hence, these units present the final opportunity to determine a patient’s HIV status if she is to benefit from the PMTCT programme. A Rapid Test can determine a mother’s HIV status before labour begins; if necessary, antiretroviral therapy can commence (see Rauscher, 2003). The patient’s HIV status should be indicated on the obstetric record to enable midwives to educate her appropriately.

• Antiretroviral therapy for mothers — It is recommended that every HIV-positive woman receives a Nevirapine 200-mg tablet once she is in active labour. If the patient is in false labour and an extended time has passed after she took the tablet, it is recommended that another Nevirapine 200-mg tablet is administered once actual labour commences (McCoy et al., 2002).

• Anaemia can be managed by doing a routine Hb measurement for each woman after admission to obtain a baseline value. A low Hb value is an indication that a full blood count (FBC) is required, and the patient should be given blood if necessary, according to the obstetrics unit’s policy.

• Preterm labour before 37 weeks should be avoided because it doubles the transmission risk if the mother is HIV-positive (Woods, 1999). Neonates born after spontaneous preterm labour have a higher risk of HIV infection than neonates born at term (Gelber & Shapiro, 1999). If the cervix is dilated <6cm the patient can be treated with Ipradol or Adalat as prescribed in the national guidelines; if the cervix is dilated ≥6cm the midwife is advised to commence with the delivery.

• Vaginal lavage with chlorhexidine 0.25% is recommended at admission and 4-hourly thereafter until the cervix is fully dilated (Biggar et al., 1996). Cotton gauze, soaked with chlorhexidine 0.25%, is used to wipe the birth canal. Chlorhexidine 0.25% de-activates the HIV virus in utero. This intervention makes a specific difference when the membranes have been ruptured for longer than 4 hours (Jenkins-Woelk, 1998). It is a relatively cheap procedure that should be done for all pregnant women regardless of their HIV status.

• First stage of labour — Performing a pelvic assessment on each primigravida before labour commences can reduce the first stage of labour. The usual guideline is 1-cm
**Box 1: Safe intrapartum practices with regard to mothers**

<table>
<thead>
<tr>
<th>Maternal interventions</th>
<th>Recommendations for implementation</th>
</tr>
</thead>
</table>
| HIV testing            | • Each pregnant woman to be counselled and tested for HIV before her delivery. Make use of the RapidTest method.  
                       | • Record the mother’s HIV status on the obstetric record to enable midwives to give appropriate health education regarding her reproductive life, baby-feeding options and information about the potential for vertical transmission. |
| Antiretroviral therapy with Nevirapine | • Each pregnant woman should receive a 200-mg Nevirapine tablet when actual labour commences.  
                       | • If the patient has previously been in false labour it is recommended that she take an additional 200-mg Nevirapine tablet when actual labour begins. |
| Anaemia                | • Conduct a routine Hb-measurement on each woman admitted to the obstetrics unit.  
                       | • If the Hb-value is low, take a blood sample to test full blood count (FBC).  
                       | • An Hb-value of 7–8 g/dL before delivery calls for a blood transfusion. |
| Preterm-labour         | • Prevent preterm labour before 37 weeks and treat according to gestational age.  
                       | • If signs of chorioamnionitis or placenta abrupto occur and the cervix is dilated more than 6 cm, continue with the delivery.  
                       | • If the cervix it dilated less than 6 cm, treat with Ipradol or Adalat as indicated in the national guidelines. |
| Vaginal lavage         | • Douche with an antiseptic solution such as chlorhexidine 0.25%).  
                       | • This procedure can be conducted upon admission to the labour room, and thereafter 4-hourly until delivery takes place.  
                       | • It is especially of value when the membranes have been ruptured for more than 4 hours. |
| First stage of labour  | • Conduct a pelvic assessment on each primigravida to ensure that her pelvis is adequate for a vaginal delivery.  
                       | • Monitor progress: Use guidelines of 1-cm dilatation of the cervix in 1 hour for a primigravida, and 1.5 cm dilatation of the cervix per hour for a multigravida.  
                       | • Record the findings accurately and completely on the partogram.  
                       | • Get help if unsure. |
| Second stage of labour | • Keep the second stage as short as possible: research has shown that a prolonged second stage increases the risk of vertical transmission of HIV. |
| Third stage of labour  | • Keep the third stage as short as possible, if possible no longer than 15 minutes.  
                       | • Make use of the active method to deliver the placenta since this reduces blood loss. |
| Universal infection control | • Conduct safe infection control measures at all times; this includes wearing a mask, goggles and protective clothing. |
| Rupture of membranes   | • The rupturing of membranes is regarded as a risk procedure and therefore should be conducted only if there is clinical reason.  
                       | • The risk of vertical transmission increases especially when a time lapse of more than 4 hours occurs between rupture and when the delivery commences.  
                       | • If it is necessary that the membranes be artificially ruptured, wait as long as possible before conducting the rupture.  
                       | • Make use of a clean sterile amnion hook to rupture the membranes. |
| Episiotomies           | • Avoid performing routine episiotomies, as this physical trauma increases the risk of vertical transmission.  
                       | • Episiotomies should be preformed only if there is a valid obstetric reason (e.g. a prolonged second stage or for assisted deliveries).  
                       | • Support the perineum of the mother to limit perineal and vaginal lacerations. |
| Assisted deliveries     | • Limit performing assisted deliveries as far as possible.  
                       | • Caesarean sections are not the best option in developing countries due to the financial implications and the risk of postpartum infection — especially for an immune-compromised woman. Routine elective caesarean sections are not recommended.  
                       | • When necessary, vacuum extraction should be preformed by an advanced midwife or doctor. |

- dilatation of the cervix per hour for a primigravida, and 1.5cm per hour for a multigravida (Nolte, 1998). The midwife should record these findings accurately on a partogram and call for assistance whenever in doubt.

- **Second stage of labour** — During this stage women are more vulnerable and dependent on those who care for them. The midwife plays an important role in limiting vertical transmission of HIV during this stage of labour as a prolonged second stage is associated with an increase in vertical transmission of HIV (Tallis, 1997; Thorne, 1997; McCoy et al., 2002). This stage must be kept as brief as possible.

- **Third stage of labour** — It is important to give special attention to the HIV-positive mother during the third stage of labour, since the patient is already immune compromised and intrapartum practices that limit blood loss can only be beneficial. However, the third stage is just as important as the first and second stages regarding the risk of vertical transmission of HIV: the intrapartum period only ends when the placenta is
Box 2: Safe intrapartum practices with regard to neonates

<table>
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<tr>
<th>Neonatal interventions</th>
<th>Recommendations for implementation</th>
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| Antiretroviral therapy with Nevirapine       | • If the mother receives Nevirapine within 2 hours before giving birth, the neonate should receive an additional dose of 2 mg/kg bodyweight Nevirapine suspension.  
• Otherwise, the neonate receives a single dose of 2 mg/kg bodyweight of Nevirapine suspension. |
| Cleaning secretions and blood from the neonate’s body | • The antiretroviral therapy must be given to the neonate orally, within 12 hours after birth and no later than 72 hours after birth, and therefore before discharge from the hospital.  
• The neonate should be cleaned of body secretions and blood as soon as possible after birth; use a towel and chlorhexidine 0.25% solution. |
| Suctioning the airways                       | • Avoid vigorous suctioning of the neonate’s airways, as this may cause damage to the mucus membranes.  
• Clean the neonate’s mouth with gauze and a chlorhexidine 0.25% solution.  
• Suctioning the airways is allowed when meconium aspiration occurs. |
| Gastric lavage                                | • Avoid gastric lavage as it can damage the mucus membranes. |
| Internal foetal scalp blood sampling          | • Avoid internal foetal scalp blood sampling as it increases the risk of vertical transmission. |

delivered (Peiperl, 2000). The third stage of labour also must be kept as short as possible, preferably no longer than 15 minutes. The birth attendant should make use of active management for delivering the placenta as this will reduce blood loss (Department of Health, 2002).

• **Universal infection control measures** must be implemented at all times during the intrapartum period. This includes wearing surgical masks, gowns, gloves and goggles. Suggested additions to the national guidelines regarding neonates are (see Box 2):

• **Antiretroviral therapy** — Nevirapine is the drug of choice in South Africa, a developing country with financial constraints (see Moodley et al., 2003). If a pregnant woman is HIV-positive, it is essential that the neonate receive 2 mg/kg Nevirapine within 72 hours after birth. For this reason it is vital that the mother’s HIV status is known as many mothers are discharged within 6 hours after delivery, consequently their babies may not benefit from the national PMTCT programme.

• **Cleaning the neonate’s body** — The neonate’s body should be cleaned of secretions and blood as soon as possible after birth (Anonymous, 1998); this can be done by rubbing the child’s body with chlorhexidine 0.25% solution and then drying the child with a towel.

**Conclusions**

This study clarified that each midwife who works in a maternity ward in a provincial hospital in the North West Province can make a contribution towards limiting vertical transmission of HIV by implementing safe intrapartum practices and by being knowledgeable of which prevailing practices are actually risky ones. It is important to improve and update the midwives’ knowledge through life-long learning and in-service training as new findings regarding the HIV/AIDS pandemic become known.

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**References**


