Occupational risk factors for HIV infection among traditional birth attendants in Copperbelt province, Zambia

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SUMMARY

A cross sectional survey was conducted among traditional birth attendants (TBAs) in order to determine occupational risk factors associated for HIV infection. All together 370 female TBAs were recruited into the study of whom 67 (18.1%) were trained. The median age was 50 (Q1=42, Q3=55) years. The use of mouth to mouth resuscitation was reported by 22 (6.0%) of the 365 TBAs. A total of 220 (59.6%) TBAs reported washing hands with soap and water after every contact with mothers and babies during labour and delivery. Only 42 (11.5%) TBAs used gloves all of the time when caring for women and babies during labour and delivery. Totals of 156 (42.3%) and 88 (23.8%) TBAs wore anything to protect their clothes and shoes during labour, respectively. Forty-four (11.9%) of the 369 TBAs were positive for human immunodeficiency virus (HIV) infection. After adjusting for age, TBAs who used mouth to mouth resuscitation were 6.02 (95%CI 1.97, 18.42) times more likely to be HIV positive than TBAs who did not use this method of resuscitating babies. We conclude that adherence to universal precautions was poor and that use of mouth to mouth to resuscitate babies should be discouraged.

KEYWORDS: HIV, Traditional birth attendants, occupational risk factors, Zambia

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Introduction

The first case of the acquired immunodeficiency syndrome (AIDS) in Zambia was reported in 1983.[1] In that year, 50% of the deliveries were conducted by the traditional birth attendants (TBAs).[2] In Zimbabwe, the rate of deliveries conducted by the TBAs in 1983 was 65%. [3] The TBAs may be concerned about getting the human immunodeficiency virus (HIV) because of their work. If there are cuts or sores on hands or in the mouth, TBAs can be infected through any procedure (including vaginal examination and resuscitation of babies) in which hands or the mouth come into contact with infected blood, vaginal or amniotic fluid.

Vaginal examination is conducted in order to assess the progress of labour by inserting a finger in the birth canal. In Kenya, the TBA performs a vaginal examination when the woman feels the urge to push.

If the membranes are intact, she ruptures them with the long sharpened finger nail of her index finger. [4] However, in some countries, such as Sudan, no vaginal examination is done by TBAs at all during labour. [5]

Sucking out the baby's nostrils and using the TBA's tongue to clean the eyes of the new born put the TBA in Sudan at risk of acquiring the HIV infection. [5] These are rituals performed with newborns and not efforts to resuscitate the stressed infants.

The following procedures used to resuscitate babies may put a TBA at risk of getting HIV infection: using fingers to clear mucous obstruction as practiced by TBAs in Botswana [6]; removing mucous by mouth to mouth suction as practiced by TBAs in Kenya [7]; and Malawi [8]; and placing a finger in the rectum to make the infant cry as practiced by TBAs in Ghana. [9]

Rituals and procedures to resuscitate babies as practiced by TBAs differ in different populations. It is, therefore, important to identify adverse rituals and

procedures to resuscitate babies in given populations in order to curb the AIDS pandemic. The training of TBAs started in 1973 in Zambia, however it was suspended a few years ago. The objective of this report is to document occupational risk factors for HIV infection among TBAs so that emphasis may be placed on infection control when the training of TBAs resumes.

Materials and Methods

Sample size and sampling

The sample of 370 at each site was arrived at based on a two-site study. After the study was conducted, the prevalence of HIV infection among the TBAs was 11.9% in Zambia. Considering a prevalence of 10% + 5% and a confidence level of 95%, the required minimum sample would have been 138. No sampling frame was available to adopt a random sampling procedure. TBAs were conveniently sampled using a Snow balling technique until a sample size of 370 was reached.

Questionnaire administration

Participants were reached at their homes and requested to participate in the study. We did not record the number of persons who were asked to take part in the study but refused to do so. However, we believe that this number could not have been more than 5% of the total number of persons requested to take part in the study.

Although research assistants were trained to administer the questionnaire in a local language, the questionnaire was in English. We believed that most of the TBAs could not read or write in English or in their language. Administration of the questionnaire was done in privacy.

Laboratory analysis

Specimen were processed at the nearest health facility. These were then stored in freezers and transported in cool boxes to the study centre (Tropical Diseases Research Centre, Ndola, Zambia) for HIV testing.

A recombinant enzyme linked immunosorbent assay (ELISA) was used to test for HIV infection. All HIV positive samples were retested. If the second test was negative, a third test was performed and the result for this test was taken to be the HIV status of the subject. The Western blot could not be used because of costs.

A quality control analysis for the opted test was performed with the University Teaching Hospital Immunology Laboratory (UTHIL) in Lusaka, Zambia as the referent laboratory. The UTHIL used the Wellcozyme and Western blot for HIV testing. Our test was 100% specific and 87.7% (95% confidence interval 80.1% to 95.2%) sensitive.

Statistical analysis

Preliminary analysis was done in Epi Info version 6.04b. The Yates' corrected and the Pearson's Chi-squared tests were used to test for associations where appropriate. SPSS for windows version 8.0 was used to compute odds ratios and their 95% confidence intervals. The cut off point for statistical significance was set at 5% level.

Results

Sample description

(Table 1) presents a description of the sample as well as showing associations between selected factors and HIV infection. All TBAs were females and were of median age of 50 (Q1=42, Q3=55) with a range of 21-80 years. Of the 370 TBAs, 243 (65.7%) were married. The majority of the TBAs were not trained (81.9%), and were concerned about acquiring HIV infection during the course of work (60.8%). All together, 44(11.9%) of the 369 TBAs were HIV positive.

Practices

Mouth to mouth resuscitation of babies was reported by 22 (6.0%) of the 365 TBAs. A total of 220 (59.6%) out of 369 TBAs washed hands with soap and water after every contact with mothers and babies during labour and delivery. The use of gloves all of the time when caring for women and babies during labour and delivery was reported by 42 (11.5%) of the 366 TBAs. The wearing of anything to protect their clothes and shoes during labour was reported by 156 (42.3%) and 88 (23.8%) of the 369 TBAs, respectively.

Bivariate analyses

A significant association was observed between age and HIV status. At every birthday, TBAs were 5% (OR=0.95, 95%CI 0.92 to 0.98) less likely to be HIV positive. No significant association was observed between marital status and HIV status (p=0.626).

No significant associations were observed between training and HIV status (p=0.831); nor between being

Table 1: Tradition birth attendants' characteristics and practices for mothers and babies during labour and delivery by human immunodeficiency virus (HIV) status.

Factor	Total	HIV status	
		Positive	Negative
	Median (Q1, Q3)	Median (Q1, Q3)	Median (Q1, Q3)
Age	50 (42, 55)	52 (44, 55)	50 (41, 55)
	n (%)	n (%)	n (%)
Marital status			
Married	243 (65.7)	28 (63.6)	214 (65.8)
Single	127 (34.3)	16 (36.4)	111 (34.2)
Washes hands with soap and water			
After every contact	220 (59.6)	33 (75.0)	187 (57.7)
If there is soap and water	70 (19.0)	4 (9.1)	66 (20.4)
Most times	76 (20.6)	6 (13.6)	69 (21.3)
Rarely or never	3 (0.8)	1 (2.3)	2 (0.6)
Uses gloves			
All of the time	42 (11.5)	5 (11.4)	37 (11.5)
Most times	24 (6.6)	4 (9.1)	20 (6.2)
Rarely	8 (2.2)	3 (6.8)	5 (1.6)
Never	292 (79.8)	32 (72.7)	259 (80.7)
Handling of placenta			
Always use gloves	52 (14.4)	6 (14.0)	46 (14.6)
Sometimes use gloves	13 (3.6)	2 (4.7)	11 (3.5)
No gloves, wash hands with soap and water	291 (80.8)	32 (74.4)	258 (81.6)
Wipe hands	4 (1.1)	3 (7.0)	1 (0.3)
Wears anything to protect clothes			
Yes	156 (42.3)	12 (27.3)	144 (44.4)
No	212 (57.5)	32 (72.7)	179 (55.2)
Sometimes	1 (0.3)	0 (0)	1 (0.3)
Wears shoes during delivery			
Yes	88 (23.8)	7 (15.9)	81 (25.0)
No	253 (68.6)	32 (72.7)	220 (67.9)
Sometimes	28 (7.6)	5 (11.4)	23 (7.1)
Mouth to mouth			
Yes	22 (6.0)	8 (19.0)	14 (4.3)
No	343 (94.0)	34 (81.0)	308 (95.7)
Concerned about acquiring HIV in the course of work			
Not concerned	145 (39.2)	17 (38.6)	128 (39.4)
Some concern	75 (20.3)	4 (9.1)	71 (21.8)
Very concerned	150 (40.5)	23 (52.3)	126 (38.8)
Number of deliveries			
0	180 (53.3)	169 (57.7)	11 (32.4)
1	67 (19.8)	59 (20.1)	8 (23.5)
2+	91 (26.9)	65 (22.2)	15 (44.1)
TBA received training			
Yes	67 (18.1)	9 (13.4)	35 (11.6)
No	303 (81.9)	58 (86.6)	267 (88.4)

Numbers may not add up due to missing information

concerned about getting HIV during the course of work and HIV status (p=0.088). However, significant associations were observed between the number of babies delivered in the previous month and HIV status (p=0.007); and between mouth to mouth resuscitation and HIV status (Fisher's two tail p=0.002).

Adherence to universal precautions

No significant associations were observed between use of gloves and HIV status (p=0.200), nor between handling of placenta and HIV infection (p=0.901), nor between wearing of shoes during delivery and HIV status(p=0.255). Meanwhile, associations were observed between washing hands with soap and water and HIV status (p=0.042), and between wearing anything to protect clothing and HIV infection (p=0.045).

Multivariate analysis

All factors significant at 10% level in bivariate analyses were considered in a step forward logistic regression analysis, together with age, marital status, number of deliveries in the previous one month and training. Only age (OR=0.93, 95%CI 0.89 to 0.97, p<0.001) and mouth to mouth resuscitation (OR=6.02, 95%CI 1.97 to 18.42, p=0.002) were significantly associated with the HIV status among traditional birth attendants.

Discussion

The TBAs in the current study had a median age of 50 (range 21-80) years. Only 11.5% of the TBAs used gloves all the time, and 59.6% washed hands with soap and water after every contact when caring for women and babies during labour and delivery. TBAs that used the mouth to mouth resuscitation method were about 6 times more likely to be HIV positive compared to TBAs who did not use the mouth to mouth resuscitation method.

In most settings TBAs tend to be older. For instance, in the Offot clan, Nigeria the average age for TBAs was 45.3% (range 28-70) years. In Pakistan, the average mean was 49 (range 30-80) years, and in Uganda the mean age was 42 (range 19-80) years. The age characteristic for these TBAs is similar to that of our study participants.

The methods of resuscitation reported by TBAs in the current study were turning the baby upside down, sprinkling water on body, patting baby's back, bottom or legs, blowing air in nose, on hands, back or face and mouth to mouth. These methods of resuscitating babies have been used by TBAs in Ghana. [2] In particular,mouth to mouth resuscitation is also practised by TBAs in Kenya [7] and Malawi. [8]

Mouth to mouth resuscitation should be discouraged because this puts TBAs at risk of acquiring HIV infection. However, no transmission of HIV infection during mouth to mouth resuscitation has been documented. HIV transmission is possible if there are cuts or sores in the mouth or on the lips of the TBA and come into contact with HIV infected blood or amniotic fluid.

Universal precautions dictate that hands must be washed after every contact with a patient or body fluid such as blood or amniotic fluid. Given that about 60% of the TBAs adhered to this precaution, there is still room for improvement. The risk of acquiring HIV infection during delivery and caring of the newborn may be reduced to a minimum [13], if TBAs always wash hands after every contact with blood, vaginal or amniotic fluid. There is a need to retrain TBAs and provide them with appropriate barrier precautions such as gloves and gowns. Under a quarter of the TBAs wore shoes during labour and delivery. TBAs without shoes might have their feet soaked with blood. Therefore, provision of protective shoes should also be considered.

The results of this study may be biased towards the TBAs who resided in the Copperbelt province of Zambia, and may not be generalised to TBAs in the entire country.

Conclusion

We conclude that adherence to universal precautions was poor and that use of mouth to mouth to resuscitate babies should be discouraged because it put TBAs at risk of acquiring HIV infection. Other methods of resuscitating babies such as turning babies upside down should be encouraged. There is need to retrain and train more TBAs in infection prevention.

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