

May 2003

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### Recommended Citation

Obuekwe, Ifeyinwa Flossy and Obuekwe, Ifechukwude Chuma (2003). Identifying Indigenous Health Technologies Used by Women in a Rural Community in Nigeria on the Cord Stumps of Newborns: A Decrease in Cord Infections and Neonatal Tetanus?. *Journal of International Women's Studies*, 4(3), 148-153.

Available at: <https://vc.bridgew.edu/jiws/vol4/iss3/11>

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## Identifying Indigenous Health Technologies Used by Women in a Rural Community in Nigeria on the Cord Stumps of Newborns: A Decrease in Cord Infections and Neonatal Tetanus?

By Obuekwe Ifeyinwa Flossy<sup>i</sup> and Obuekwe Ifechukwude Chuma<sup>ii</sup>

### Introduction

Cord infections and neonatal tetanus contribute significantly to high neonatal mortality rates in developing countries. These infections are preventable and can be reduced by practicing clean delivery and clean cord care, by increasing tetanus toxoid immunization coverage (1). Each year some 500,000 infants die of neonatal tetanus and a further 460,000 die as a consequence of severe bacterial infection (2).

Neonatal tetanus and cord infections continue to be an important cause of neonatal morbidity and mortality in developing countries. A number of factors contribute to a high incidence of tetanus and infection in these countries. Most deliveries take place at home, often in unhygienic circumstances, deliveries are conducted by untrained birth attendants, and some traditional cord practices are harmful. When the cord is cut, the cord stump is suddenly deprived of its blood supply and soon starts to dry and turns black and stiff (dry gangrene). Drying and separation of the stump is facilitated by exposure to air. The umbilical stump is a common route of entry for systemic infections in the newborn infant. Keeping the stump clean and dry is therefore very important if infection is to be prevented. The newborn has no protective flora at birth. Normal skin flora begin to be acquired within 24 hours. The umbilicus is colonized by bacteria from environmental sources such as, the mother's vagina (3), her skin flora and the hands of caregivers (4). Once colonized, the umbilicus acts as a reservoir of bacteria that may cause cross-infection in the nursery (5). The factors that cause colonization of the cord stump to progress to infection are poorly understood.

There is evidence that cord infections are common in developing countries. One hospital study found that in 47% of infants hospitalized with sepsis, cord infections was the source of the illness and that 21% of infants admitted for other reasons had omphalitis, (cord infection) (6). The greatest period of risk for umbilical stump contamination with bacteria including *C. tetani* is the first three days of life. Risk decreases with time as the umbilical heals and stump separates (7). The risk of cord infection is increased by unhygienic cutting of the cord application of unclean substances to the stump. A variety of traditional practices and beliefs are associated with care of the umbilical cord. Some traditional practices such as applying unclean substances to the cord are dangerous and should be discouraged or replaced with safer alternatives, while others are beneficial and should be promoted. In some cultures, the cord is milked, especially if the baby is not breathing in order to bring the baby's soul back from the mother (8). Materials used to tie the cord include strings, threads and strips of cloth. Sometimes blades of grasses, bark fibers reeds or fine roots are used, this is harmful because such materials often harbor tetanus spores from the soil and thus increase the risk of neonatal tetanus (9).

This study examines some indigenous health technologies used by women in a rural community, Oregbeni, in Benin City, Edo State, Nigeria on the cord stumps of their

newborns and also to ascertain if some of these practices are harmful or beneficial thereby leading to a decrease in cord infections and neonatal tetanus.

### **Methodology**

#### *The Study Site:*

This study site - Oregbeni village - is located near Benin City an Urban Center in the South-West of Nigeria. The population of the area is about 100,000 and it is 5km from the City Center. The people are mainly peasant farmers and petty traders, whose main occupation is selling of farm produce. There is a community hospital, school, market and a place of worship. The lifestyle of the people has been greatly influenced by its nearness to the city and as such electricity and pipe-borne water have been provided. Small -scale industries are scattered here and there, providing menial jobs for some of the rural dwellers. The traditional practices of the people are deeply embedded in their beliefs and customs.

### **Subjects**

Three hundred respondents comprising women of childbearing age and those who have had babies were used for this study. An open-ended, in-depth questionnaire as well as oral interview were used because most of the subjects could not read or write. At the end of the interview, results were collated and analyzed.

### **Results**

The ages of the 300 respondents used in this study ranged from 29 to 70 years. The highest number was recorded with those around 40 years of age where over one-third of the subjects fell within. There were different traditional practices used by the respondents and these included: leaves of *Bryophyllum pinnatum* (67.7%); native chalk with salt (46.7%); clean hot sand (20%); human spit (6.7% ); leaves of *Ocimum gratissimum* (6.7%); beast milk - colostrum (6.7%); palm oil with hen's feather (6.7%) and hot water (6.7%). The substances were applied directly on the cord stumps (73%); mixed with other substances (like salt) and heated on fire in local earthenware pots (53.4%); leaves were slightly heated on fire and water squeezed out before application (60%); or applied with hen's feather (6.7%); (Table 1).

For those respondents who had used conventional (Western) methods, they also claimed that it took between 7-14 days for the cord stumps to fall off, while it only took 3-4 days when the traditional substances were applied. Some of these have also recommended the traditional methods to other family members and friends because of their effectiveness. There were also very many positive views on the preference of these traditional substances to the orthodox methods. Two hundred and sixty (86.7%) preferred traditional practice because the cord stumps fell within 3-4 days of application, the wound healed faster and there was quicker relief as the substances applied were very effective (Table 2).

None of the respondents reported any incidence of tetanus infection during use of these indigenous methods.

## Discussion

The results of this study have clearly shown that traditional practices are preferred to orthodox methods for application on the cord stumps of newborns by the women of Oregbeni Community, Benin City, Edo State of Nigeria. The umbilical cord is left long in most traditional cultures. Exceptionally, it is cut very short, as in communities in Uganda (10). In Ecuador, the cord is left 12-15 cm long in girls because it is believed that anything shorter than that would cause a girl to have a small uterus and narrow hips later in life and therefore, have difficulty in childbirth (11).

A variety of tools are used to cut the cord. They are usually items that are available in the house, or relate to the father's trade, such as scissors, knives, broken glass, sickles or used razor blades. These are rarely cleaned or boiled before use and are dangerous sources of infection. Some communities have more beneficial customs such as, heating the knife over a fire or candle before cutting the cord (12). This correlated with this study, where most of the respondents claimed that new razor blades were used in cutting the cord stumps of their newborns. Some kind of substance is applied to the cord stump in most cultures and these include ash, oil, spice, pastes, mud (sand) and herbs. These substances are often contaminated with bacteria and spores and thus increase the risk of infection. In this study, 20% of the respondents used hot sand on the cord stumps of their newborns. It should be noted here that the spores of *Clostridium tetani*, the organism that causes tetanus can survive very high temperatures and the hot sand would not be able to kill off the spores. The most common reasons given for applying a substance to the cord are to prevent bleeding from the stump and to promote separation of the stump. In KwaZulu Natal (13) and in some communities in Kenya (12), some women apply expressed milk (colostrum) to the cord stump (this could in fact be beneficial in view of the antibacterial factors present in breast milk). In this study, 6.7% of the respondents used breast milk on the cord stumps of their newborns.

Many newborn infections were spread by medical attendants who failed to recognize the value of washing their hands. Current medical practices: washing hands before cord care; wearing of gloves; clamping the cord with sterile clamps; and cutting it with sterile scissors or blade are based on the principle of aseptic techniques. They have led to reduction in omphalitis, neonatal tetanus and sepsis. Routine care of the cord usually includes daily cleaning of the stump with alcohol and application of dusting powder or an antimicrobial solution. Powders currently used contain varying proportions of zinc oxide, starch or alum talc and other ingredients. In this study, most of the respondents (93.3%) preferred traditional practices to the routine hospital care of the cord. They claimed that it took only 3-4 days for the cord stumps to fall off as against 7-14 days with the conventional methods. Studies have also shown that antimicrobials prolong the time it takes the cord to separate (14, 15, 16). The clinical significance of this delay has not been studied, but it appears to be of no medical consequence. However, late separation of the cord is disliked by parents as it worries them and entails more home visits by midwives, thus increasing their workload and the cost of postnatal care (17). Another disadvantage of using topical antimicrobials is increased cost. Depending on the products used, the cost of this intervention ranges from about US \$0.38 to US \$1.50, (18). In the present study, the cost ranged from US \$2 to US \$5 and most of these women may not afford it because they do not earn any income.

In conclusion, clean cord care practices should be the main focus of any clean delivery and cord care program. There is some evidence however, that they are protective against neonatal tetanus when applied to the cord stump for the first few days. In high risk areas, especially where the custom is to apply dangerous substances to the stump, it might therefore be useful to advise using a topical antimicrobial as a transitional measure to help wean the community away from harmful substances.

### **Recommendations**

Traditional practices may also conflict with recommendations. The application of harmful substances to the cord stump may be deeply rooted in the local culture and applying nothing to the cord may be unacceptable. Suggesting the use a safe alternative substance (e.g. an antiseptic) may be appropriate in such circumstances.

People's traditions and beliefs must be used as a basis for introducing new practices. Current medical cord practices, such as early cord clamping/active management of the third stage of labour or applying antiseptics to the cord may not apply to developing countries where most deliveries take place at home and resources are scarcer. Touching the cord, applying unclean substances to it and applying bandages should be avoided. Early and frequent breast feeding will also provide the new born with antibodies. In areas of high risk of neonatal tetanus or where harmful practices such as using sand on the stump are prevalent, an antimicrobial can be recommended to replace the harmful substance. The chosen antimicrobial should have a broad-spectrum of activity against bacteria and should be cheap, culturally acceptable (a coloured antiseptic is usually preferred) and available (1). If other harmful practices are prevalent, they should be discouraged or replaced with safer alternatives. At community level, local cord care practices should be studied

Disposable delivery kits containing at a minimum a new razor blade, clean ties, a piece of soap and instructions for use can be made available to mothers and TBAs through prenatal clinics or women's groups. Coverage of women of childbearing age with tetanus toxoid immunization should be the main focus and must be encouraged and increased.

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**Table 1. Different traditional practices and methods of application of substances used on the cord stumps by respondents.**

<b>i. Types of substances used</b>	<b>Number of Respondents</b>	<b>%</b>
<b>Distribution</b>		
Leaves of <i>Bryophyllum pinnatum</i>	180	66.7
Native chalk with salt	140	46.7
Clean hot sand	60	20
Human spit	20	6.7
Leaves of <i>Ocimum gratissimum</i>	20	6.7
Breast milk (colostrum)	20	6.7
Palm oil with hen's feather	20	6.7
Hot water alone	20	6.7
<b>ii. Traditional substances used</b>		<b>Methods of application</b>
Leaves of <i>Bryophyllum pinnatum</i>	Leaves slightly heated on fire,	
Leaves of <i>Occimum gratissimum</i>	water squeezed out, and applied on stump	
Native chalk	Mixed with sand and other substances and heated on fire in earthenware pots.	
Human spit	Put directly on cord	
Breast milk (colostrum)		
Lean hot sand		
Hot water		

Palm oil

With hen's feathers

**Table 2. Time taken for the cord stumps to fall off after application of substances and reasons for preferring traditional substances on cord stumps to orthodox methods.**

<b>i. Number of days taken for stumps to fall</b>	<b>Number of respondents</b>	<b>% Distribution</b>
3 days	160	53.4
3-4 days	60	20
4 days	20	6.7
More than 4 days	20	6.7
*Between 7-14 days	80	26.8

  

<b>ii. Reasons</b>	<b>Number of Respondents</b>	<b>% Distribution</b>
Stump falls within 3 days of application	260	86.7
Wound heals faster	280	93.3
Quicker relief to newborns and their mothers.	220	73.3
Very effective	260	86.7

**Usually when stump falls wound is pressed with hot water and oil/hot balm is also applied.**

**\*For those who also used conventional methods (antimicrobials).**

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