

Cord care practices and use of chlorhexidine gel among mothers in a hospital in southwest Nigeria

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Abstract

Background/Aims Using chlorhexidine gel for neonates during the first week of life is an important strategy for preventing sepsis and achieving optimal cord care. This study aimed to assess knowledge and practice of cord care and the use of chlorhexidine gel among mothers attending a hospital in southwest Nigeria.

Methods A descriptive survey was carried out, using random sampling to select 184 mothers attending antenatal and postnatal clinics in Lagos State General Hospital, Shomolu, Lagos. Associations between variables were tested using Pearson's correlation at 0.05 significance.

Results Almost two-thirds (64.1%) of participants understood that the soiled umbilical stump should not be cleaned with water and over half (52.7%) disagreed with the use of substances such as methylated spirit, toothpaste and hot water for cord care. In practice, 97.8% cleaned the baby's umbilical cord and 84.8% cleaned the umbilical stump with chlorhexidine gel. Almost a fifth (19%) of participants applied other substances such as alcohol (methylated spirit), herbal preparations or hot water to the umbilical cord. A statistically significant association was found between knowledge and practice of cord care ($P < 0.001$).

Conclusions This study suggests that the use of chlorhexidine gel in cord care among mothers has improved compared to previous studies. More studies are needed to confirm this finding. Some participants used unhealthy cord care practices, including herbal preparations and hot water, implying a need for further interventions to address misconceptions.

Key words: Antenatal care; Chlorhexidine; Cord care; Cord care practices; Perception; Postnatal care; Umbilical cord

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Introduction

The umbilical cord is the most sensitive area in a newborn's skin for bacterial growth (Ortegón et al, 2017). Newborn umbilical cord infection (omphalitis) is common in underdeveloped and developing nations and is one of the main causes of neonatal sepsis (Jayaswal et al, 2016), which is the third most common reason for newborn deaths in the first month following birth (Coffey and Brown, 2017).

Omphalitis is polymicrobial in origin but predominated by *Streptococcus pyogenes*, *Staphylococcus aureus* and Gram-negative bacteria such as *Klebsiella pneumoniae*, *Proteus mirabilis* and *Escherichia coli* (Painter et al, 2021). Omphalitis leads to necrotising fasciitis, myonecrosis and systemic disease (Gallagher et al, 2016). Unhygienic birth procedures and cord care practices are the main risk factors for umbilical cord infection (Mullany et al, 2006).

Nearly 30% of the 3 million neonatal deaths each year around the world are caused by infections (Oestergaard et al, 2011; Nangia et al, 2016). In Nigeria, infections cause significant newborn deaths (Liu et al, 2015) and research from developing nations indicates that 8-80% of all newborn deaths are caused by infections (Thaver and Zaidi, 2009).

The care a baby receives during the first hours, days and weeks of life can determine whether they remain healthy during the first day and up to 28 days. Topical antiseptics have

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been used to reduce the incidence of umbilical cord infections in newborns (Imdad et al, 2014). The neonatal death rate in Nigeria was estimated at 37 per 1000 live births in the 2013 Nigeria demographic and health survey (Akinyemi et al, 2015). With 82 000 maternal deaths in 2020, Nigeria had the highest number of maternal deaths in the world, contributing to more than a quarter of maternal deaths worldwide (World Health Organization (WHO), 2023).

Although the use of hand washing, clean birth kits and other hygiene practices after birth are important components of a programme to reduce neonatal sepsis, there is thus far, no evidence to show that these interventions mitigate infection-related neonatal mortality (Hundley et al, 2012). In January 2014, a new recommendation for cord care was issued by the WHO (2014). For neonates delivered at home in areas with high neonatal mortality, this required daily application of 7.1% chlorhexidine digluconate aqueous solution or gel, delivering 4% chlorhexidine to the umbilical cord stump throughout the first week of life (WHO, 2014). The WHO (2017) suggested that topical antiseptics can be used for dry umbilical cord care in areas of poor hygiene practices (Bhatt et al, 2015).

Clean, dry cord care is recommended for newborns delivered in health facilities and at home in low neonatal mortality settings, while the use of chlorhexidine has been suggested to replace traditional practices that involve the application of substances such as cow dung (WHO, 2014). A systematic review and meta-analysis of clustered randomised controlled trials involving 54 624 participants revealed that the application of chlorhexidine culminated in a 27-56% reduction in umbilical cord infection and a 23% reduction in neonatal mortality (Imdad et al, 2014).

In Nigeria, evidence suggests that umbilical cord infections account for around 20% of neonatal admissions and close to 50% of neonatal deaths (Afolaranmi et al, 2018). Various traditional cord practices have been found in Nigeria, including the use of cow dung, ash and hot compresses for cord care (Abegunde et al, 2017; Okpaleke, 2017). Methylated spirits are also used for cord care, as found by Ndikom et al (2020) in Ibadan, Ochoga et al (2020) in Makurdi and Onubogu et al (2022). Ochoga et al (2020) and Onubogu et al (2022) also reported that there was low awareness or use of chlorhexidine in Nnewi, Nigeria.

Although unsafe cord care practices have been discouraged in Nigeria, and the use of chlorhexidine has been encouraged, little is known about the current cord care practices in Lagos, Nigeria. The main objective of the present study was to assess cord care practices and the use of chlorhexidine gel in umbilical cord care among mothers attending antenatal and postnatal care at a state hospital in southwest Nigeria.

Methods

A quantitative descriptive research design was used to assess quantifiable data on cord care practices and the use of chlorhexidine among mothers in the study setting.

Sampling

The study population was nursing mothers attending antenatal and postnatal clinics of the Lagos State General Hospital in Shomolu. During the month when the study was conducted, 500 women were attending the antenatal and postnatal clinics. To calculate sample size, Cochran's (1977) formula was used and random sampling selected 218 respondents from the population.

Data collection

A self-designed questionnaire with three sections was used for data collection. Section A covered sociodemographic data, section B focused on mothers' knowledge of umbilical cord care practices and section C assessed cord care practices. Sections B and C were measured on a Likert scale (strongly disagree, disagree, undecided, agree, strongly agree).

The instrument's face and construct validity were assessed by experts in research and midwifery. Reliability was evaluated in a pre-test with 23 mothers attending antenatal or postnatal care at Lagos Island Maternity Hospital, who were not part of the final sample. The calculated Cronbach's alpha score of 0.79 indicated the instrument's reliability.

For data administration and collection, the researcher established contact with at least one staff member at the hospital department for the study. A research assistant was employed

for data collection. A total of 218 copies of the questionnaire were distributed and 184 were retrieved and found suitable for data analysis, giving a response rate of 84.4%. The questionnaires were administered between 1 and 29 September 2021 at the antenatal and postnatal care clinics of Somolu General Hospital, Lagos State.

Data analysis

Descriptive statistics, including frequency distribution and tables, were used to describe the data. Inferential statistics were used to test the association between variables at 0.05 level of significance. The association between knowledge and cord care practices was assessed using Pearson's correlation.

Five questions were used to assess knowledge of cord care practices. Two were positively worded and three were negatively worded. For positively worded questions, answers were categorised as: strongly agree=4, agree=3, disagree=2, strongly disagree=1 and undecided=0. The reverse was the case for negatively worded questions. Higher scores indicated better knowledge.

Ethical considerations

Ethical approval was obtained from the research and ethics committee of the Lagos State Health Service Commission (approval number: LSHSC/DNS/RESEARCH/VOL.11/102). The research ethics guidelines as outlined in the Declaration of Helsinki were adhered to (World Medical Association, 2013). All participants provided informed consent after a detailed explanation of the research procedure was given.

Results

Table 1 outlines the participants' sociodemographic characteristics. The majority were married (70.7%), of the Yoruba ethnic group (74.5%), and were Christians (89.1%). Half were first degree holders (50.0%) and worked as nurses (50.0%). The largest proportion of participants were aged 41–50 years (38.0%) and had 1–10 years' working experience (41.8%).

Table 2 outlines participants' responses to the knowledge questions for cord care practices. The greatest proportion strongly disagreed with the use of other substances for cord care (27.7%), and that a soiled umbilical stump should be cleaned with water (36.4%), while 34.8% strongly agreed that the cord should be left clean and dry without applying substances. The majority of respondents disagreed or strongly disagreed that various materials should be used to tie a baby's umbilical cord (52.2%), but the largest proportion were unsure if scissors, a razor blade or a knife could be used to cut the cord stump (37.0%). Only 19.6% of the respondents strongly agreed or agreed that other substances should be applied after cleaning the baby's umbilical cord.

Table 3 shows the participants' reports of their own cord care practices. The majority of respondents knew what was used to cut their baby's cord (84.2%) and reported that the instrument used was sterile scissors (88.6%). Almost three-quarters (70.6%) used alcohol, herbal preparations or hot water to clean the stump, but almost all participants used chlorhexidine gel to clean the cord (97.8%) and the stump (84.8%).

Association between knowledge and practices

Table 4 shows that there was a significant association between knowledge and cord care practices among mothers attending antenatal and postnatal care at the hospital.

Discussion

The present study provides insight into cord care practices among mothers attending antenatal and postnatal care in southwest Nigeria. The majority of participants cleaned their baby's umbilical cord and umbilical stump with chlorhexidine gel. Contrary to this finding, Onubogu et al (2022) found that only 2.8% of respondents in Nnewi, Nigeria were aware of chlorhexidine gel. Similarly, Ochoga et al (2020) reported high use of methylated spirit among mothers in Markurdi, Nigeria, but low usage of chlorhexidine

Table 1. Sociodemographic characteristics

Characteristic	Category	Frequency, n=184 (%)
Age (years)	20–30	55 (29.9)
	31–40	50 (27.2)
	41–50	70 (38.0)
	51–60	9 (4.9)
Marital status	Single	54 (29.3)
	Married	130 (70.7)
Education	Senior School Certificate Examination/ General Certificate Examination	19 (10.3)
	Diploma	53 (28.8)
	First degree	92 (50.0)
	Masters	20 (10.9)
Ethnicity	Hausa	3 (1.6)
	Igbo	44 (23.4)
	Yoruba	137 (74.5)
Religion	Christianity	164 (89.1)
	Islam	18 (9.8)
	Traditional	2 (1.1)
Occupation	Trader	5 (2.7)
	Teacher	34 (18.5)
	Civil servant	24 (13.0)
	Lawyer	21 (11.4)
	Nurse	92 (50.0)
	Other	8 (4.3)
Work experience (years)	1–10	77 (41.8)
	11–20	62 (33.7)
	21–30	35 (19.0)
	≥31	10 (5.4)

gel. The increased use of chlorhexidine gel recorded among women in the present study may be related to the fact that half of the participants were nurses, who are likely to have been aware of the recommendation for the use of chlorhexidine gel in cord care (WHO, 2014). This suggests that nurses may be in a position to encourage the use of chlorhexidine among mothers.

Furthermore, this study highlights the perceived effectiveness of chlorhexidine gel in cord care, as two-thirds of the participants agreed that the cord fell off quickly after application of chlorhexidine. This finding has also been reported in Kenya (Muriuki et al, 2017). A systematic review also confirmed the effectiveness of chlorhexidine among mothers more widely in developing countries (Imdad et al, 2014).

The participants' knowledge of cord care was also assessed. Most demonstrated good knowledge of cord care practices, as over two-thirds understood the necessity of cleaning and application of chlorhexidine to the umbilical cord. This finding is supported by studies that reported good knowledge of cord care among mothers attending primary health centres

Table 2. Knowledge of mothers on umbilical cord care practices

Item	Response, n=184 (%)				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Substances such as methylated spirit, toothpaste and hot water should be used for cord care (negatively worded)	37 (20.1)	30 (16.3)	20 (10.9)	46 (25.0)	51 (27.7)
A soiled umbilical stump should be cleaned with water (negatively worded)	24 (13.0)	17 (9.2)	25 (13.6)	51 (27.7)	67 (36.4)
Cord clamp, twine, string of cloth, bandage and thread should be used to tie a baby's umbilical cord (positively worded)	33 (17.9)	37 (20.1)	18 (9.8)	62 (33.7)	34 (18.5)
Scissors, a razor blade or a knife should be used to cut a baby's umbilical cord stump (negatively worded)	19 (10.3)	44 (23.9)	68 (37.0)	32 (17.4)	21 (11.4)
Other substances should be applied after cleaning the baby's umbilical cord (negatively worded)	29 (15.8)	7 (3.8)	52 (28.3)	69 (37.5)	27 (14.7)
The cord should be left clean and dry without applying any substances (positively worded)	64 (34.8)	39 (21.2)	11 (6.0)	55 (29.9)	15 (8.2)

Table 3. Cord care practices among mothers

Item	Response, n=184 (%)				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I know what was used to cut my baby's cord	81 (44.0)	74 (40.2)	11 (6.0)	15 (8.2)	3 (1.6)
Sterile scissors were used to cut the baby's cord	131 (71.2)	32 (17.4)	9 (4.9)	8 (4.3)	4 (2.2)
I used alcohol (methylated spirit), herbal preparation and hot water for cleaning the umbilical cord	24 (13.0)	11 (6.0)	19 (10.3)	56 (30.4)	74 (40.2)
I cleaned the baby's umbilical cord with chlorhexidine gel	133 (72.3)	47 (25.5)	0 (0.0)	4 (2.2)	0 (0.0)
I applied other substances to the umbilical cord stump	9 (4.9)	33 (17.9)	36 (19.6)	40 (21.7)	66 (35.9)
I applied chlorhexidine gel to the umbilical cord stump	126 (68.5)	30 (16.3)	3 (1.6)	15 (8.2)	10 (5.4)
The cord dried and fell off quickly after applying chlorhexidine gel	78 (42.4)	45 (24.5)	6 (3.3)	23 (12.5)	32 (17.4)

Table 4. Association between knowledge and cord care practices

Variable	Cord care practices	
Knowledge of cord care	Pearson Correlation	0.432
	Significance (2-tailed)	0.000
	n	184

in Ibadan, Nigeria (Ndikom et al, 2020), and mothers attending antenatal care in Sokoto, Nigeria (Ango et al, 2021).

Good knowledge may be connected with literacy, as this study was conducted in Lagos, an urban area with a large percentage of literate women; 80.6% of women in southwest Nigeria were literate as of 2018 (Statista, 2022). As a result of higher levels of education, the participants may have had access to up-to-date knowledge of cord care practices. There was a correlation between knowledge and cord care practice, a finding that is supported by Ndikom et al (2020). This suggests that those with higher education may have been exposed to good cord care practices through educational institutions or

Key points

- The umbilical cord is a sensitive area for bacterial growth in newborns.
- The World Health Organization has recommended the use of chlorhexidine solution or gel for care of the umbilical cord.
- Previous studies suggest low uptake of chlorhexidine use in care of the umbilical cord.
- This study found that the use of chlorhexidine gel has improved, and most participants had a good knowledge of cord care practices.
- Some practices, such as the use of herbal preparations and hot water, persist and highlight the need for further interventions.

the internet via mobile devices, as evidence shows a high rate of mobile phone use among Nigerian women (Akingbade et al, 2022). These platforms could be used to disseminate information regarding good cord care practices. However, more studies are needed to confirm these findings regarding cord care practices among women with lower education and those in rural areas.

Although the present study's findings suggest that participants were knowledgeable in cord care practices, some gaps were observed in their knowledge. Over one-third agreed that substances such as toothpaste and hot water should be used for cord care, and around one in five agreed that a soiled umbilical stump should be cleaned with water. These gaps highlight the need for further awareness and educational interventions to correct misconceptions.

Recommendations

Given the findings of this study, the authors recommend increased public awareness campaigns on the benefits of chlorhexidine for cord care through mass media and social media. Nurses and midwives should provide improved continuous education to pregnant women on the use and benefits of chlorhexidine gel during antenatal clinics, and the government should ensure that chlorhexidine gel is readily affordable and accessible.

Limitations

A large percentage of the respondents had formal education, which may have affected the findings. However, this is representative of the area, as Lagos has one of the highest percentages of women with secondary school education or higher in Nigeria (National Population Commission, 2019). Further studies should be conducted among those that do not have formal education to confirm the present study's conclusions. The study was conducted in only one health facility and might not be generalisable.

Conclusions

Most participants in the present study were knowledgeable regarding cord care practices, and used chlorhexidine gel in the care of the umbilical cord. However, unhealthy cord care practices among some of the respondents suggest the need for further awareness and educational interventions to address misconceptions.

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