



Cord care among mothers of sub-urban Lewllem community of Jos South LGA, Plateau State, Nigeria

Isah HO^{1*}, Bassi AP¹, Chima G²

¹Department of Community Medicine and Primary Health Care, Bingham University, New Karu, Nasarawa State, Nigeria

²Department of Family Medicine, Bingham University, New Karu, Nasarawa State, Nigeria

ABSTRACT

Care of the cord is a known determinant of an infant's well-being in neonatal life period, and when not according to standard frequently results in high prevalence of neonatal infections and complications, some fatal. This study sought to determine the practice of cord care among mothers of Lewllem Community of Jos South LGA, Plateau State, Nigeria. This was a community-based descriptive cross-sectional study among 300 women of reproductive age group 15-49 years with children less than 5 years of age. Substances commonly applied to cord of babies, reasons for cord care, respondents' age, educational status and ANC attendance were determined. Along with tables and proportions, associations between respondents' educational and age status and type of substances, reasons for cord care and duration for cord care with significant level at $pV < 0.05$ were determined. Methylated spirit (57.60%), Vaseline (39.22%), warm water salt solution (16.61%), plain warm water (9.54%) and herbs/native preparation (1.77%) were found in use with achieving the shrivel (drying) of the cord (50.33%), prevention of cord infection (28.33%), timely detachment of the cord (22.67%) and prevention of development of bad odor by cord (2.33%) as reasons for cord care. There was no statistical significant association between educational attainment and choice of the substances ($pV = 0.1656$), respondents' age and reasons for cord care ($pV = 0.9226$), educational attainment and reasons for cord care ($pV = 0.3006$) and educational attainment and duration of cord care ($pV = 1.0000$). Presence of a health facility within study setting and 95.5% ANC attendance rate did not impact on respondents' choices of appropriate substances and informed reasons for cord care. Quality of MCH services made available to pregnant mothers by the health facility, and skills of service providers will require review for remedial measures.

KEYWORDS: *Cord care, Lewllem Community, infections, Jos*

INTRODUCTION

The status of the umbilical cord, the channel through which the baby in utero receives nutrients, is a known determinant of well-being of an infant in-utero and in neonatal life period. Its post-delivery care and within the neonatal period, when not according to standard norms, frequently results in high prevalence of fatal neonatal infections [1]. In Nigeria like all developing countries, infections from unsafe umbilical cord practices account for a

significant proportion of neonatal deaths. In a 2015 Report "Nigeria state data profiles: An accountability tool for maternal, newborn and child health in Nigeria", a combined 36% of all causes of neonatal deaths were attributable to sepsis and tetanus from umbilical infections with proximate causes related to poor immediate postpartum cord-care choices and persisting negative cultural beliefs and practices [2]. Globally, poor umbilical cord hygiene resulting in infection of umbilical cord in the first week of life remains a dominant factor in the 13% of the approximately three (3) million newborn deaths that occur each year. Nigeria, along with

India, is a known major contributor to this global neonatal mortality [3-5]. Outside India, Nigeria with other sub-Saharan African countries account predominantly for such potentially harmful practices resulting in infection of umbilical cord in the first week of life [6-8].

Cord care practices vary by and between countries, regions and cultural settings, with the application of variety of substances [9]. Many of these applications are associated with harmful consequences. The use of chicken, lizard, cow dung have been reported in countries like Haiti, Uganda and Zambia [10]. In some other settings, motor and machine oil, methylated spirit, Dettol, oil cow dung and herbal preparation in addition to other substances such as toothpaste, ash, powder and variety of concoction as cleaning and drying agents after the use of knives, scissors, sickles, slice of sharp bamboo stick in cutting and tying the cord with thread, strings often unsterilized, hair thread and palm fronds have been reportedly found in use [9, 11-13]. In Zambia, for example, the use of substances such as powders of root origin, burnt gourds or ash, lubricating agents (petroleum jelly, Vaseline, cooking oil and used motor oil), commercial baby lotion and baby powder, charcoal, cow dung and chicken droppings and breast-milk have been documented [6,7]. In Ilesha, Osun State, Nigeria, commonly applied materials and methods include cleaning with methylated spirit, hot water massage and application of Shea butter [14]. These were often without attendant aseptic practices such as hand-washing before and after care, washing cord with clean water and soap, keeping cord dry and exposure to air. The desire to hasten the separation of the cord stump is often the predominant reason for cord care post-delivery. In a study population in Edo State, Nigeria, this was found to be the basis for such application such as sand, salt, native chalk, saliva, petroleum jelly, menthol-containing balm, herbs and heat [15].

A number of factors influence cord care practices among mothers. Female education and empowerment, ANC service uptake and socio-cultural factors, long established as determinant of child survival strategy, have been shown as strong factors in cord care practices [16-18]. Dire consequences to cord health emanate where these factors are poor. In addition is maternal age with older mothers found to practice more of beneficial cord care than younger ones, probably stemming from differential experience gathered over time from previous deliveries [15]. Non-skilled attendance at delivery coupled with absent knowledge and good

practice of appropriate cord care practice, high in prevalence in some settings, is a major factor in poor cord care outcome [19-21]. The prevailing wide options available in cord care practice as advocated by health facilities and often appearing confusing to mothers create the avenue for the application of various types of substances, many with attendant deleterious effects.

Towards addressing the challenges of umbilical sepsis from poor cord management, the World Health Organization, has, over the years, advanced the use of several potent anti-microbial agents and products for use among which have been triple dye, tincture iodine, iodophors, antibiotic ointments, silver sulfadiazine, povidone-iodine and of late, chlorhexidine [22-25]. In addition is the emphasis on cord care by care givers, especially TBAs in rural settings, as well as emphasis on female education and empowerment as designated child survival strategies towards healthy cord care practices [21].

Neonatal sepsis continues to remain a principal challenge to achieving further reduction in neonatal under-5 mortality, critical to attaining the 4th MDG globally. Umbilical cord hygiene in the first week of life is a well-documented factor in neonatal welfare and where it is poor, a significant risk factor that increases the likelihood of neonatal infection with attendant mortality. This study sought to determine the practice of cord care among mothers of Lewllem Community of Jos South LGA, Plateau State, Nigeria.

MATERIALS AND METHODS

This was a community-based descriptive cross-sectional study carried out among women of reproductive age group 15-49 years with children less than 5 years of age in Lwellen community of Tanchol in the sub-urban district of Gyel in Jos South LGA of Plateau State, Nigeria. Based on an accompanying community survey, the community has a total of 703 households with a population of 3,210 individuals out of which there were 320 mothers of reproductive age group of 15-49 with children aged 5 years and below. The community has a PHC facility located within it, providing PHC services to its population therein as well as to those in neighboring communities adjoining it. The decision to focus on women with children aged 5 years and below was to obtain information as current as possible on cord care practice, and thus reflecting prevailing profile. Information on knowledge and practice of cord care was collected via interviewer-administered questionnaire. Prior

ethical clearance was obtained from Bingham University Teaching Hospital Ethical Research Committee. Permission for community entry was obtained from Jos South Local Government Council and from the traditional rulers at all levels of Lwella community, Tanchol and Gyel District. At each household level, consent was obtained from the head of the family after due explanation regarding the study was provided. In addition to being informed of the voluntary nature of participation, the respondents were assured of confidentiality of information to be collected and the non-reflection of their identities as well as that of their respective households. The entire 320 eligible mothers were taken as the study sample. Outcome measures included main substances commonly applied to cord of babies, reasons for cord care, respondents' age, educational status and ANC attendance. Tables and proportions were used to illustrate results and outcomes. Type of substances, reasons for cord care and duration for cord care were examined against respondents' two important social variables of educational and age status for any potential association. Significant level for any association was taken at $pV < 0.05$.

RESULTS

Table 1: Commonly used Substances for Cord Care

Commonly Used Substance	Prevalence of Use (%)
Warm water	9.5
Methylated Spirit	57.6
Salt and warm water	16.6
Vaseline	39.2
Herbs/ Local Preparations	1.8

Table 2: Educational Status and Substances applied for cord care

Educational Status	Plain water	Warm	Methylated Spirit	Warm Salt Solution	Vaseline	Herbal/Local Preparations
Below Secondary School	10.2%		50.3%	17.4%	39.5%	3.0%
Secondary School and Above	7.5%		59.4%	13.5%	36.8%	0.0%

$$X^2 = 6.486; pV = 0.1656$$

On level of educational attainment by respondents and their choice of substances in the care of their babies' cords (Table 2), a greater proportion of those with secondary school education and above (59.4%) compared to those with lower level of education (50.3%) employed the use of methylated spirit. Higher proportions of those with comparatively lower educational level employed Vaseline ointment (39.5%), warm salt solution

A total of 300 women within the reproductive age group of 15 – 49 years successfully participated in the study. Among the study group, 9.3% had no formal education while 46.3%, 39.0% and 5.3% had primary school, secondary school and tertiary education. Twenty percent (20%) were full-time house wives with no employment providing any form of economic livelihood. Traders, farmers, artisans and civil servants accounted for 25.0%, 23.7%, 30.4% and 1.0% respectively. Being an indigenous population, 95.3% of respondents were of the local ethnic group of Berom and are entirely of the Christian faith. Mean parity was 4 with a range of 1-11. ANC uptake rate was 95.5% based on their immediate past pregnancies, and at the PHC facility located within the community. Incidence of contaminated cord among newborns of respondents based on recall history was 12.3%.

Among the respondents, a number of substances or preparations were found to be in use in their care of the cord of the newborn (Table 1). Commonly, these include methylated spirit (57.60%), Vaseline (39.22%), warm water salt solution (16.61%), plain warm water (9.54%) and herbs/native preparation (1.77%).

(17.4%) and plain warm water (10.2%) compared to those with secondary school education and above (36.8%, 13.5% and 7.5%). None of those with secondary school education and above were found to use to herbal/local preparations as compared to the 3.0% of those with lower than secondary school education. However, there was found no statistical significant association between educational attainment and choice of the substances ($X^2 = 6.486; pV = 0.1656$)

Table 3: Main Reasons for Cord Care

Main Reasons for Cord Care	%
Prevention of cord infection	28.3
Cord's timely detachment (fall-off)	22.7
Shriveling (dry up) of the cord	50.3
Prevention of development of bad odor by cord	2.3
Miscellaneous reasons	3.7

A number of reasons were adduced by respondents for the care of their infants' cord (Table 3). Chiefly among there to achieve the shrivel (drying) of the

cord (50.33%), prevention of cord infection (28.33%), timely detachment of the cord (22.67%), prevention of development of bad odor by cord (2.33%) and a mix of others (3.67%).

Table 4: Age and Reasons for Cord Care

Age	Prevention of cord infection	Cord's timely detachment (fall-off)	Shriveling (dry up) of the cord	Prevention of development of bad odor by cord	Miscellaneous reasons
15 – 24	29.6%	42.3%	26.8%	1.4%	2.8%
25 – 34	28.1%	51.6%	24.2%	2.6%	3.9%
35 – 44	26.9%	52.2%	13.4%	3.0%	3.0%
Above 44	22.2%	44.4%	22.2%	0.0%	11.1%

$X^2 = 5.868; pV = 0.9226$

Those concerned with timely detachment of their babies' cords were within the age group 35-44 years (52.2%) compared to the 51.6%, 44.4% and 42.3% of the age groups 25-34 years, above 44 years and 15-24 years respectively (Table 4). As for prevention of cord infection, there was a higher proportion (29.6%) amongst the age group 15-24 years compared to 28.1%, 26.9% and 22.2% of age groups 25-34 years, 35-44 years and above 44 years respectively. Shriveling of the baby's cord

was a main a reason for cord care among 26.8%, 24.2%, 22.2% and 13.4% of age groups 15-24, 25-34, above 44 years and 35-44 years respectively. 3.0%, 2.6% and 1.4% of those in the age groups of 35-44, 25-34 and 15-24 years were respectively concerned with preventing the development of offensive odor by their babies' cords. There was however no statistical significant association between respondents' age and reasons for cord care ($X^2 = 5.868; pV = 0.9226$).

Table 5: Educational Status and Reasons for Cord Care

Educational Status	Prevention of cord infection	Cord's timely detachment (fall-off)	Shriveling (dry up) of the cord	Prevention of development of bad odor by cord	Miscellaneous reasons
Below Secondary School	24.0%	56.3%	22.2%	1.8%	2.4%
Secondary School and Above	33.1%	42.9%	23.3%	3.0%	5.3%

$X^2 = 4.873; pV = 0.3006$

Table 6: Educational Status and Duration of Cord Care

Educational Status	<1 week	>1 week
Below Secondary School	66.5%	33.5%
Secondary School and Above	66.9%	33.1%

$pV = 1.0000$ (Fisher's Exact Test)

Table 5 shows that a greater proportion of those with secondary school education and above (33.1%) were driven by the desire to prevent infection of their babies' cords as compared to 24.0% of those with lower than secondary school education. However, a higher proportion of those with less than secondary school education (56.3%) were motivated by their desire for cord's timely detachment compared to the 42.9% of those with secondary school education and above. Comparatively, a higher proportion of those with secondary school education and above were concerned with shriveling (drying up) of the cord (23.3%), prevention of development of bad odor (3.0%) and other miscellaneous reasons (5.3%) when compared to those with lower than secondary school education (22.2%, 1.8%, 2.4% respectively). However, there was found no statistical significant association between educational attainment and reasons for cord care ($X^2 = 4.873$; $pV = 0.3006$). Longer duration of cord care (Table 6) was found to be more among those with educational level below secondary (33.5%) compared to those with educational level of secondary school and above (33.1%) while comparative duration was found more with those with higher level of education (66.9%) as compared to those with lower level (66.7%). However, there was found no statistical significant association between educational attainment and duration of cord care ($pV = 1.0000$, Fisher's Exact Test).

DISCUSSION

The study reveals a variety of substances in use and reasons for cord care among the study population in this sub-urban population. Like in previous settings and surveys [9-15], this study found a wide variety of substances in use for cord care, some with potential for adverse effect on infants' cords and resultant complications. The recalled prevalence of 12.3% of infected cords speaks to this and may be understatement if in-depth review of cord status is undertaken.

Education and age (and indirectly respondents' parity) had no significantly influence on respondents' choices and reasons for cord care in this study as observed from previous studies [15-18]. The proximity, accessibility and 95.5% use rate of health services (essentially ANC services) during pregnancy apparently had no influence on the practice of cord care with respect to choices and reasons for cord care.

Chlorhexidine, the much recommended substance for cord care was not a mentioned substance in use

by respondents in cord care. Instead, methylated spirit, rather than the more effective and recommended chlorhexidine in terms of ensuring asepsis found use among majority of the population. Worrisome is the application of inappropriate substances and methods with potential for cord infection by respondents, even in the face of a 95.5% ANC attendance. Implication is that health education during ANC is deficient in providing the respondents with needed education and counseling on appropriate substances and protective practice. Vaseline ointment, with no antiseptic value found substantial use among the study group. In addition is the use of warm salt solution with no known proven antiseptic properties. It is thus not surprising therefore of the 12.3% cord contamination prevalence rate as recorded through recall by respondents. Respondents' age, and by extension their parity status, as well as educational status were not found to influence choice of appropriate substance and reasons for cord care.

This is indicated by the lack of association between age and educational status and these outcome measures. The presence of a health facility and accessible health services within the vicinity of respondents' community apparently seem to have made no significant impact in shaping the choice of appropriate substance and reasons for cord care.

There may thus be inherent deficiency in the quality of services, principally health education and ANC services, being provided by the PHC service providers to health facility users in the community. Like in some other settings [19-21], there thus dire consequences for cord care in the community of these respondents. The spectrum of materials (which include substances of unproven antiseptic properties, some with outright dire health implications) and reasons for cord care (substantially not for infection prevention) in the presence of 95.5% utilization of ANC services by mothers indicate potential inherent gaps and deficiency in quality of these vital health service being provided to pregnant mothers within the community of study.

The content and quality of health education and ANC services as provided by the health facility within the community will thus require review and potential gaps addressed. In addition, the providers (health care workers) will require attention in enhancing their service provision, especially with respect to ANC and post-delivery services.

REFERENCES

1. Saleh JA, Nemecek J, Jones C. Impact of hygienic caring of the umbilical cord in the prevention of neonatal tetanus. *WebmedCentral PUBLIC HEALTH* 2015; 6 (5): WMC004889
2. Federal Ministry of Health, Save the Children. Nigeria state data profiles. An accountability tool for maternal, newborn and child health in Nigeria. 2015. <https://www.healthynewbornnetwork.org>
3. Liu L, Johnson HL, Cousens S, Perin J, Scott S, Lawn JE, Rudan I, Campbell H, Cibulskis R, Li M, et al. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. *Lancet*. 2012;379(9832):2151–2161.
4. Ezeh OK, Agho KE, Dibley MJ, Hall J, Page AN. Determinants of neonatal mortality in Nigeria: evidence from the 2008 demographic and health survey. *BMC Public Health*. 2014; 14:521.
5. United Nations Children's Fund (UNICEF). The state of the world's children 2009: maternal and newborn health. New York: UNICEF. p. 2008.
6. Herlihy JM, Shaikh A, Mazimba A, Gagne N, Grogan C, Mpamba C, Sooli B, Simamvwa G, Mabeta C, Shankoti P, et al. Local perceptions, cultural beliefs and practices that shape umbilical cord care: a qualitative study in Southern Province, Zambia. *PLoS One*. 2013;8(11):e79191.
7. Sacks E, Moss WJ, Winch PJ, Thuma P, van Dijk JH, Mullany LC. Skin, thermal and umbilical cord care practices for neonates in southern, rural Zambia: a qualitative study. *BMC Pregnancy Childbirth*. 2015;15:149.
8. Semrau KE, Herlihy J, Grogan C, Musokotwane K, Yeboah-Antwi K, Mbewe R, Banda B, Mpamba C, Hamomba F, Pilingana P, et al. Effectiveness of 4% chlorhexidine umbilical cord care on neonatal mortality in Southern Province, Zambia (ZamCAT): a cluster-randomised controlled trial. *Lancet Glob Health*. 2016;4(11):e827–e836.
9. Coffey PS, Brown SC. Umbilical cord-care practices in low-and middle-income countries: a systematic review. *BMC Pregnancy Childbirth*. 2017 Feb 20; 17(1): 68. doi: 10.1186/s12884-017-1250-7
10. Waise P and Kaikoba S. Acceptability of evidence-based neonatal care practice in rural Uganda: Implications for programming. *Int Nurs J* 2 (2): 52 – 54
11. Osuorah Donatus I Chidiebere, Ekwochi Uchenna, Onah Stanley, E Ebruke Bernard. Umbilical cord care practices and incidence of febrile illnesses in the first month of life among newborns – a population based study. *British Journal of Medicine & Medical Research* 5(11): 1422 – 1430, 2015, Article no. BJMMR.2015.160
12. J Ambe, M Bello, S Yahaya, B Omotara. Umbilical cord care practices in Konduga Local Government Area of Borno State North-Eastern Nigeria. *The Internet Journal of Tropical Medicine*. 2008 Volume 5 Number 2.
13. John ME, Nsemo AD, John EE, Opiah M, Robinson-Bassey GC, Yagba J. Indigenous child care beliefs and practices in the Niger Delta region of Nigeria: implications for health care. *Int J Health Sci Res*. 2015; 5(11): 235 – 247
14. Nwosu J, Odubanjo MO, Osinusi BO. Reducing maternal and infant mortality in Nigeria. (Workshop Summary). The Nigerian Academy of Science. West African Book Publishers, Lagos, Nigeria. 2009; 14 - 117
15. Abhulimhen-lyoha BI, Ibadin MO. Determinants of cord care practices among mothers in Benin City, Edo State, Nigeria. *Niger J Clin Pract* 2012; 15: 210-3
16. NDHS. 2008 National Demographic and Health Survey. Fact Sheet. North-East Zone – Unicef. <https://www.unicef.org>
17. Opara PI, Jaja T, Dotimi DA, Alex-Hart AB. Newborn cord care practices amongst mothers in Yenagoa Local Government Area, Bayelsa State, Nigeria. *International Journal of Clinical Medicine*, 2012, 3: 22 – 27
18. Osuchukwu EC. Umbilical cord care and management outcome among mothers in Calabar South Local Government Area, Cross River State, Nigeria. M.Sc. Dissertation submitted to Department of Health Sciences and Technology, University of Nigeria, Enugu Campus, January 2014 (accessed www.unn.edu.ng)
19. Fapohunda BM, Orobato NG. When women deliver with no one present in Nigeria: who, what, where and so what? *PLoS One*. 2013;8(7):e69569.
20. Austin A, Fapohunda B, Langer A, Orobato N. Trends in delivery with no one present in Nigeria between 2003 and 2013. *Int J Women's Health*. 2015;7: 345–356.
21. National Population Commission -

- NPC/Nigeria and ICF International. Nigeria Demographic and Health Survey 2013. Abuja: NPC/Nigeria and ICF International; 2014.
22. WHO (1998). Care of the umbilical cord. A review of evidence. WHO/RHT/MSM/98.4 ed. Maternal and Newborn Health Safe Motherhood. World Health Organization (WHO). Division of Reproductive Health (Technical Report). Family and Reproductive Health. 1998
 23. WHO (2006). Neonatal and Perinatal Mortality: Country, Regional and Global Estimates. Geneva. World Health Organization. www.who.int
 24. WHO (2007). Review of evidence on cord care practices. WHO/RHT/MSM/98.4 ed. Maternal and Newborn Health Safe Motherhood. World Health Organization (WHO). Division of Reproductive Health (Technical Report). Family and Reproductive Health, 2007
 25. WHO (2013). WHO Recommendations on postnatal care of the mother and newborn. <https://www.ncbi.nlm.nih.gov>