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Newborn cord care practices amongst mothers in Makurdi, Benue State Nigeria

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Abstract: *Background:* Omphalitis is a neonatal infection resulting from unhygienic care of the umbilical cord. In 2014, the World Health Organization issued a new recommendation; the application of daily Chlorhexidine gel to the umbilical stump. The aim of this study was to determine cord care practices common amongst mothers in Makurdi Local Government area of Benue State in North Central Nigeria.

Methodology: The study was a cross-sectional study carried out at the well-baby Immunization Clinic of the Benue State University Teaching hospital (BSUTH) and the Immunization Clinic at the Epidemiology unit of the Benue State Ministry of Health both in Makurdi Local Government area of Benue State from April to July 2018. Subjects were mothers presenting with their babies at these clinics during the study period. Information was collected using a structured interviewer-administered questionnaire.

Results: Three hundred and ninety-eight mother-infant pairs participated in this study. Of the infants the males were 205 (51.5%) while the females were 193 (48.5%); they were aged 1-16 days with mean age of 4.29 ± 2.37 days. Two hundred and seventy-two (68.3%) mothers had their babies' cords cleaned with methylated spirit alone while 11 (2.8%) cleaned with methylated spirit and another substance. The commonest substance applied to cord after cleaning was Vaseline 58(14.6%). *Conclusion:* The use of methylated spirit for cord care is high among mothers in Makurdi, the uptake of Chlorhexidine as recommended by WHO is significantly very low and this calls for more concerted efforts in educating mothers about the use of Chlorhexidine for cord care.

Key words: Chlorhexidine, Cord care, Mothers, Newborn, Practices,

Introduction

The umbilical cord is formed from the connecting stalk after development of blood vessels in the stalk during the embryonic stage and it connects the fetus to the mother till after birth when it is normally severed.¹

The umbilical cord contains the two umbilical arteries, the umbilical vein, the rudimentary allantois, the remnant of the omphalomesenteric duct and a gelatinous substance called Wharton jelly.² When the cord sloughs after birth, portions of these structures remain in the base. The blood vessels are functionally closed but anatomically patent for 10-20 days and during this interval the umbilical vessels are potential portals of entry for infection.²

Omphalitis is a neonatal infection resulting from unhygienic care of the umbilical cord, which continues to be a problem particularly in developing countries.² Neonatal

sepsis is a major cause of neonatal mortality globally. Each year 3 million newborns die globally and infection causes approximately 13% of these deaths and in Nigeria it contributes about six per cent of infant mortality with an incidence of about 18.2/1000 livebirths.^{3,4,5}

In 2014, the World Health Organization issued a new recommendation; the application of daily chlorhexidine gel to the umbilical stump during the first week of life, because ensuring optimal cord care at birth and in the first week of life (including use of chlorhexidine) especially in settings with poor hygiene, is a crucial strategy to prevent life threatening sepsis and cord infections and avert preventable neonatal deaths.⁶

The use of chlorhexidine was recommended to replace the application of several harmful substances applied to the newborn umbilical cord by mothers in developing countries.⁶ These unhygienic harmful practices are still prevalent in different parts of Nigeria as documented by

several studies.

In their study of konduga LGA of Borno State, Ambe et al in 2008 documented prevalent cord care practices such as application of hot fermentation 31.5%, use of rag and lantern 19.5%, use of Vaseline 9.3%, use of ash/charcoal 9.3%, use of red sand 3.5% respectively.⁷

Opara *et al.*, in their study of cord care by mothers in Port Harcourt in 2012, reported the use of petroleum jelly 58%, hot balms 20.3% antibiotic ointments 11.6% and use of toothpaste 5.8%.⁸ In a study on the determinants of cord care practices carried out in Benin, Abhulimhen-Iyoha *et al.*, reported that 76.8% of mothers who participated in the study were aware of beneficial cord practices and yet used other substances.⁹

Similarly, in the study of cord care practices amongst mothers in Yenogoa LGA of Bayelsa State, Opara *et al.*, reported use of methylated spirit 29%, antibiotic ointment 40.2%, herbs/cow urine 8.1%, Vaseline 8.1% and use of hot balms 3.6%.¹⁰ The aim of this study was to determine cord care practices common amongst mothers in Makurdi Local Government area of Benue State in North Central Nigeria.

Materials and methods

The study was a cross-sectional study carried out at the Well-baby Immunization Clinic of the Benue State University Teaching hospital (BSUTH) and the Immunization Clinic at the Epidemiology unit of the Benue State Ministry of Health both in Makurdi Local Government areas of Benue State from April to July 2018. Benue State is a rich agricultural region and is named after the Benue River and was formed from the former Benue-Plateau State in 1976.¹¹ It is bounded on the South by Cross River, Ebonyi, and Enugu states, on the West by Kogi State, on the North by Nassarawa and on the North-east by Taraba State. Makurdi is the state capital.

With assumption of 29% of global harmful cord care practices from a previous study, an error margin of 5% and a power of 95%, a sample size of 316.3 was arrived at using the formula $n = Z^2Pq/d^2$. Taking into account a dropout rate of 10%, the calculated sample size was adjusted to 356.1. This was increased to 398 to reduce attrition bias and increase the power of the study.

Subjects were mothers presenting with their babies at these clinics during the study period. Those who did not consented were excluded from the study. Information was collected using a structured interviewer-administered questionnaire.

Information collected included; bio data, age and sex of baby, educational status and occupation of parents, place of antenatal care and delivery, cord care practices for index child and problems encountered if any in cord care.

Ethical approval was obtained from the BSUTH Health Research Ethical Committee and informed consent obtained from each participant.

Data collected was analyzed using SPSS version 20. Descriptive statistics were generated for each study variable including frequencies and percentages for categorical variables, mean and standard deviation for quantitative variables. Chi-square was used to determine the association between categories of the dimensions (cord care practices), and socio-demographic characteristics predicting cord care practice for the various dimensions. Cord care dimensions was used as the dependent variable in a separate logistic regression model including the patient's socio-demographic characteristics. Only variables associated with a p value < 0.10 in bivariate analysis were considered eligible for inclusion in multiple logistic regression analysis. Level of statistical significance was set at 5%.

Results

Three hundred and ninety-eight mother-infant pairs participated in this study. The age range of the mothers was 15-46 years with mean age of 27.88 ± 5.36 . Majority 161 (40.5%) of mothers were in the age range of 26-30 years. One hundred and eighty-six (46.7%) mothers had secondary education, while 147 (36.9%) had post-secondary education. A slightly higher proportion 123 (30.9%) were house wives, closely followed by 108 (27.1%) who were traders. In terms of parity, 119 (29.9%) mothers were primiparous (Table 1). Mothers' level of education was significantly associated with cord care practice ($\chi^2 = 31.13$, $P < 0.01$) (Table 6).

Of the infants, the males were 205 (51.5%) while the females were 193 (48.5%). The infants were aged 1-16 days with mean age of 4.29 ± 2.37 days. Their mean weight was 3.10 ± 0.47 kg. (Table 2).

Three hundred and forty-six mothers (86.9%) received antenatal care. Of those that received antenatal care, 135 (39.0%) received ANC at tertiary level health centre while, 102 (29.5%) and 101 (29.2%) received ANC at private clinics and secondary level health centre respectively. Majority of mothers, 186 (46.7%) mothers delivered at private clinics, followed by 102 (25.6%) mothers who delivered at home (Table 3). Place of ANC and place of delivery were significantly associated with cord care practice ($\chi^2 = 19.98$, $p < 0.01$) and ($\chi^2 = 9.47$, $p < 0.05$) respectively. (Table 6).

Baby's cord was commonly cut with scissor and razor blade 159 (39.9%) and 109 (27.4%) respectively. Cord clamp was used in 336 (84.4%) infants, while black thread was used for securing the cord in 62 (15.6%).

Two hundred and seventy-two (68.3%) mothers had their babies cord cleaned with methylated spirit alone while 11 (2.8%) cleaned with methylated spirit and another substance. Six (1.5%) mothers allowed cord to dry without applying anything. The commonest substance applied to cord after cleaning was Vaseline in 58 (14.6%) of cases. Other substance applied include; Oil/Vaseline 28 (7.0%), Chlorhexidine 22 (5.5%), Toothpaste 21 (5.3%). (Table 5)

Three hundred and seventy-two (93.5%) mothers reported that there was no problem with their baby's cords. Twenty-five (6.3%) mothers reported discharges from the cord, while only 1 (0.3%) reported bleeding.

Table 6 shows logistic regression of association and determinants of cord care practice. Civil servant (aOR=2.93, CI=1.19 -7.21, p=0.019), Trading (aOR=2.61, CI=1.36 -4.98, p=0.004), parity-1 (aOR=3.68, CI=1.17 -11.47, p=0.025) and parity-2 (aOR=3.86, CI=1.22 -12.24, p=0.022) were significantly associated with more likelihood of methylated spirit alone as cord care practice. Conversely, private clinics (aOR= 0.49, CI=0.25-0.97, p=0.040), No formal education (aOR=0.21, CI=0.52-0.87, p=0.031) and primary education (aOR=0.38, CI=0.17-0.86, p=0.021) were significantly associated with the less likelihood of methylated spirit alone as cord care practice.

Table 1: Socio-demographic characteristics of mothers

Variables	Frequency	Percent
<i>Age (in years)</i>		
15-20	38	9.5
21-25	97	24.4
26-30	161	40.5
31-35	63	15.8
36-40	33	8.3
>40	6	1.5
Mean 27.88±5.36		
<i>Level of education</i>		
No formal education	13	3.3
Primary education	52	13.1
Secondary education	186	46.7
Post-secondary education	147	36.9
<i>Occupation</i>		
Civil servant	60	15.1
Trading	108	27.1
Farming	25	6.3
Artisan	38	9.5
Public servant	6	1.5
Unemployed	38	9.5
House wife	123	30.9
<i>Parity</i>		
1	119	29.9
2	98	24.6
3	80	20.1
4	54	13.6
5	25	6.3
6	22	5.5

Table 2: Socio-demographic characteristics of Infants

Variables	Frequency	Percent
<i>Age (in days)</i>		
1-3	168	42.2
4-6	151	37.9
7-9	71	17.8
10	8	2.0
Mean 4.29±2.37		
<i>Sex</i>		
Male	205	51.5
Female	193	48.5
<i>Infant weight</i>		
Mean 3.10±0.47		

Table 3: Place of antenatal care and place of delivery

Variables	Frequency	Percent
<i>Attended ANC</i>		
Yes	346	86.9
No	52	13.1
<i>Place of ANC</i>		
Private clinics	102	29.5
Primary health centre	8	2.3
Secondary level health centre	101	29.2
Tertiary level health centre	135	39.0
<i>Place of delivery</i>		
Private clinics	186	46.7
Secondary level health centre	40	10.1
Tertiary level health centre	70	17.6
Home	102	25.6

Table 4: Instrument used to cut and tie the cord

Variables	Frequency	Percent
<i>Instruments use to cut cord</i>		
Scissor	159	39.9
Razor blade	109	27.4
Surgical blade	11	2.8
Don't know	119	29.9
<i>Instruments to tie cord</i>		
Cord Clamp	336	84.4
Black hair thread	62	15.6

Table 5: Cord care practice

Variables	Frequency	Percent
<i>Materials use to clean cord</i>		
Methylated spirit alone	272	68.3
Methylated spirit plus*	11	2.8
Toothpaste	41	10.3
Vaseline	5	1.3
Herbs	14	3.5
Chlorhexidine	30	7.5
Water	7	1.8
Nothing	6	1.5
Others (Engine oil, water, salt, olive oil)	12	3.0
<i>Substance applied after cleaning</i>		
Vaseline	58	14.6
Chlorhexidine	22	5.5
Oil/Vaseline	28	7.0
Toothpaste	21	5.3
Hot balms	4	1.0
Palm kernel oil	10	2.5
Vaseline/salt	12	3.0
Salt	10	2.5
Others (Antibiotic ointment, milk, engine oil, herbs, water)	10	2.5
Nothing	223	56.0

*Methylated spirit plus-Chlorhexidine, Tooth paste

Table 6: Association and determinants of cord care practice

Variables	Cord care practice		aOR(95%CI)	P-value
	Methylated spirit and other substance n(%)	Methylated spirit alone n(%)		
Place of ANC			19.98**	
None	30(57.7%)	22(42.3)	0.43(0.18 –1.03)	0.059
Private clinics	30(29.4%)	72(70.6)	1.52(0.75 –3.07)	0.247
Primary health centre	2(25.0)	6(75.0)	3.62(0.53 –24.83)	0.190
Secondary level health centre	31(30.7)	70(69.3)	1.28(0.62 –2.67)	0.508
Tertiary level health centre	33(26.2)	102(75.6)	Reference	
Place of delivery			9.47*	
Private clinics	63(33.9)	123(66.1)	0.49(0.25 –0.97)	0.040*
Secondary level health centre	10(25.0)	30(75.0)	0.84(0.31 –2.26)	0.725
Tertiary level health centre	13(18.6)	57(81.4)	1.35(0.51 –3.58)	0.544
Home	40(39.2)	62(60.8)	Reference	
Level of education			31.13**	
No formal education	9(69.2)	4(30.8)	0.21(0.52 –0.87)	0.031*
Primary education	30(57.7)	22(42.3)	0.38(0.17 –0.86)	0.021*
Secondary education	54(29.0)	132(71.0)	0.95(0.51 –1.75)	0.868
Post-secondary education	33(22.4)	114(77.6)	Reference	
Occupation			29.59**	
Civil servant	9(15.0)	51(85.0)	2.93(1.19 –7.21)	0.019*
Trading	26(24.1)	82(75.9)	2.61(1.36 –4.98)	0.004*
Farming	16(64.0)	9(36.0)	0.68(0.24 –1.94)	0.469
Artisan	15(39.5)	23(60.5)	0.98(0.43 –2.23)	0.961
Public servant	0(0.0)	6(100.0)	-	-
Unemployed	12(31.6)	26(68.4)	1.03(0.44 –2.39)	0.946
House wife	48(39.0)	75(61.0)	Reference	
Parity			11.51*	
1	34(28.6)	85(71.4)	3.68(1.17 –11.47)	0.025*
2	23(23.5)	75(76.5)	3.86(1.22 –12.24)	0.022*
3	28(35.0)	52(65.0)	1.99(0.63 –6.24)	0.239
4	22(40.7)	32(59.3)	1.75(0.53 –5.75)	0.359
5	7(28.0)	18(72.0)	3.11(0.72 –13.44)	0.129
6	12(54.5)	10(45.5)	Reference	

Note: **=p<0.01, *=p<0.05

Discussion

The results of our study showed that majority of the women were between ages 26-30 years (40.5%) and this was similar to what was reported by Asiegbu *et al.*,¹² in Abakaliki and Osuchukwu *et al.*,¹³ in Calabar. About 87.2% received ante-natal care and the place of ANC and subsequent delivery significantly affected cord care practices. In our hospital, ANC education classes are facilitated by nurses, as a result of this, the choice of cord care practices is influenced by the disposition of the nurses. This was similarly reported by Abegunde *et al.*,¹⁴ Abhulimhen-Iyoha *et al.*,⁹ Opara *et al.*,¹⁰ and Afolaranmi *et al.*,¹⁵ It is worthy to note that most of the mothers attended ANC but delivered more in private clinics and at home, this is worrisome and may be associated with harmful cord care practices. Mothers who delivered at home or in private clinics were more prone to use harmful substances. We discovered that majority of the mothers knew what was used to cut the cord, the use of scissors (39.9%) and razor blade (27.4%) for severing the cord was more common and this too was similar to

what was reported by Abegunde *et al.*,¹⁴ Osuorah *et al.*,¹⁶ and Lawrence *et al.*¹⁷. Majority of the babies (84.4%) had their cord clamped with a cord clamp. This was higher than what was reported by Osuchukwu *et al.*, (62%), Afolaranmi *et al.*, (73.1%) and Ambe *et al.*, (4%).^{13,15,7} The use of methylated spirit in cleaning the cord was found in 68.3% of mothers and this was less than the percentage reported by Opara *et al.* (95.3%),⁸ Afolaranmi *et al.*, (73.2%)¹⁵ but higher than Osuchukwu *et al.* (49.8%)¹³ and Kaoje *et al.*, (40.7%)¹⁸. The higher percentages of the use of methylated spirit recorded in the other studies was before the WHO recommendation of the use of chlorhexidine gel, despite that we recorded low rates in our study (5.5%) which is lower than what has been reported by Abegunde *et al.*,¹⁴ (21.5% in Bauchi) and (17.1% in Sokoto), while Kaoje *et al.*, from Sokoto reported (32.5%). One of the possible reasons for the low uptake is unavailability of chlorhexidine gel although the reason was not explored in this study. There was also use of other substances for cord care such as Vaseline (14.6%), toothpaste (5.3%), palm kernel oil and engine oil 2.5%. This had some cultural associations depending on the ethnic origin. We however noted that majority of the mothers (93.5%) reported no problems with the cord and this was similar

to what was reported by Ambe *et al.*, (90.8%),⁷ but unlike Osuchukwu *et al.*,¹³ who reported problems with the cord in (75.1%) of the mothers.

The use of methylated spirit was significantly associated with occupation (Civil servant and traders) and parity (lesser parity; 1 & 2) whereas place of ANC attendance (private clinics) and educational level (primary and no formal education) were significantly associated with non-use of methylated spirit. These findings were similar to what has been documented by Asiegbu *et al.*,¹² (education, occupation and parity), Abhulimhen-Iyoha *et al.*,⁹ (maternal education), and Opara *et al.*,¹⁰ (maternal education).

by WHO is significantly very low and this calls for more concerted efforts in educating mothers about the use of chlorhexidine for cord care. We also noted that good cord care practices are significantly associated with maternal level of education and place of delivery and this again brings to the fore the need to prioritize female education, incorporate health talk on good care practice in their routine ANC services for improved child survival as well as the need to educate practitioners in private practice about the use of chlorhexidine.

Conflict of interest: None

Funding: None

Conclusion

In conclusion, we have noted that while the use of methylated spirit for cord care is high among mothers in Makurdi, the uptake of chlorhexidine as recommended

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