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Original Research Article

Thermal Care Practices in a Rural Area of Dibrugarh District: A Community Based Cross Sectional Study

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Abstract: Adequate thermal protection is essential for the survival of a newborn immediately after birth. If adequate thermal protection is not provided to the newborn immediately after birth, the newborn finds difficult to adjust with the external environment. The present study was conducted to find out the prevailing thermal care practices of newborn in a rural area of Dibrugarh district, Assam. A study was conducted among 257 infants aged 0-6 months in a rural area of Dibrugarh district, Assam from August 2013 to July 2014. Data was collected by interviewing the mothers of the infants using a pre-designed and pre-tested proforma. Majority of infants (55.3%) were in the age group of 5-6 months. 51.8% were males and 60.7% were of birth order 1. 82.5% belonged to Hindu religion, 67.3% belonged to OBC category and 68.5% were joint families. Most of the families (42.0%) belonged to socioeconomic Class IV. Majority of the deliveries (97.7%) were institutional. 98.4% neonates were cleaned by mopping with cloth after birth. 98.4% neonates were dried and wrapped immediately after birth. 99.2% neonates were wrapped with a sterile cloth. Skin-to-skin contact was given to 85.6% neonates. 98.4% neonates were given first bath after 24 hours of delivery. All the mothers (100.0%) used warm water to bath her baby. 73.5% neonates were initiated breastfeeding within 1 hour of birth. 91.8% neonates were fed colostrums. The study revealed that correct thermal care was practiced in the rural area of Dibrugarh. Adequate health education regarding thermoregulation of newborn should be given to health care provider.
Keywords: Thermal care, neonates, rural area

INTRODUCTION:

Neonatal hypothermia is widely recognised as an important contributing factor to neonatal morbidity and mortality [1]. A newborn has a limited capacity to maintain an optimal core body temperature due to immature thermal regulatory system soon after birth. When a newborn suffer from certain disadvantages such as low birth weight or prematurity, they become more vulnerable to develop neonatal hypothermia. Even a healthy term baby lose on average 0.1 to 0.3 degree Celsius per minute of heat if adequate prevention are not taken immediately after birth [2]. This loss of body heat occurs by conduction, convection, evaporation and radiation from the body of newborn [3]. Such drop in temperature can lead to serious and potentially life threatening complications such as hypoglycaemia, respiratory distress, hypoxia, metabolic acidosis, and even death [2]. To protect a newborn from such consequences of hypothermia, appropriate external thermal protective measures are essential immediately after birth [2].

The World Health Organization has recommended certain thermal protective measures which are essential for newborn to maintain the right body temperature at birth [4]. Effective thermal protection measures provide the new-borns a comfort environment by preventing heat loss and promoting heat gain [4]. In large hospitals or in tertiary health facilities, hypothermia is managed by conducting deliveries in warm room and keeping the newborn in an incubator. However, in resource-constrained and remote rural areas, such advanced care and services may not be available in health facilities such as in PHCs or during home deliveries. In these settings, adopting simple practices such as immediate drying and wrapping, delaying the first bath of the newborn for first 24 hours and providing skin to skin contact can prevent heat loss while early initiation of breastfeeding within one hour and colostrum feeding can generate body heat which ultimately can be effective in preventing hypothermia in newborn [5]. Keeping this point in mind the following

study was conducted to assess the thermal care practices in a rural area of Dibrugarh district.

MATERIAL AND METHODS:

Study area:

As per as Census 2011, total population of Dibrugarh district was 13, 26,335. Majority of the people (81.64%) live in rural areas [6].] Hindus comprise a little over 90 percent of the total population. About 4 percent of the population belongs to Scheduled Caste and about 7 percent to Scheduled Tribes [7]. As per AHS 2012-13, literacy rate in the district was slightly ahead of the State levels. Overall literacy rate in Dibrugarh was 81.7%, and in males it was 88.3% and 74.7% in females and in rural areas it was 78.3% [8].] Regarding employment, there was preponderance of agricultural sector in the district. Total Employment in agriculture sector was 68.7% [9]. Regarding the public health infrastructure of the District, there are 6 Block PHCs, 5 CHCs, 10 Mini-PHCs, 10 State Dispensaries, 240 SC and 1 Medical College [10].

Study period: The study was conducted in the rural area of Dibrugarh district for a period of one year from August 2013 to July 2014.

Study design: Community based cross sectional study.

Sample size: A sample size of 257 was calculated considering the percentage of children breastfed within 1 hour of birth in rural areas of Dibrugarh district to be 79.9% (DLHS-3) and taking 5% absolute error [11].

Sampling design:

There are 6 Block PHCs in Dibrugarh district. For conducting the study one block namely Lahowal Block was selected randomly. A list of all the sub-centres (SC) in the Lahowal Block was prepared. There were a total of 35 SCs. The number of study subjects (mother of infants aged 0-6 months) to be included from each SC was decided by proportional allocation. The mother of infant aged upto 6 months was taken to get maximum number of infant during the study period. In each sub-centre the first house was selected by picking up a random starting number, thereafter consecutive houses were visited until the required number of study subjects in each sub-centre area was obtained. The same procedure was repeated in all the sub-centres until the required sample size was achieved.

The data was analyzed using standard statistical software: SPSS (version 16.0) and presented by using percentage and Chi-Square test. The study was conducted after clearance by the Institutional Ethics Committee of Assam Medical College and Hospital, Dibrugarh.

Inclusion criteria:-

All the mothers of infant's upto 6 months who gave consent

Exclusion criteria:-

The mothers of the infants who were not willing to give consent and were non co operative

RESULTS

As shown in Table 1, majority of the neonates belonged to age group of 5-6 months (55.3%) followed by 3-4 months (33.5%) and 1-2 months (11.2%). 51.8% of the neonates were males while 48.2% were females and 60.7% were of birth order 1. Most of the neonates (82.5%) belonged to Hindu religion, 67.3% belonged to OBC category and 68.5% were from joint families. Most of the families (42.0%) belonged to socioeconomic Class IV. As shown in Table 2. 72.8% mothers had availed 4 or more antenatal visits while 6.2% had received only one antenatal visit and 97.7% were institutional while 2.3% were home delivery. Among the institutional deliveries, 92.0% deliveries took place at public health facilities while 8.0% at private health facilities. Among public health facilities, 36.8% deliveries took place at tertiary health facilities and 63.2% at primary health facilities.

As shown in table 3. Majority of the neonates (98.4%) were cleaned by mopping with a cloth after birth while in 1.6% neonates were cleaned by bathing. 98.4% neonates were dried and wrapped immediately after birth. Sterile clothes were used in 99.2% neonates to wrap immediately after birth. Skin-to-skin contact was given to 85.6% neonates after birth.98.4% neonates were given first bath after 24 hours of delivery while 1.6% neonates were bathed within 24 hour. All the neonates (100.0%) were given bath with warm water. Regarding breastfeeding, 73.5% neonates were initiated breastfeeding within 1 hour of birth and 91.8% neonates were fed colustrums after birth. As shown in the Table 4. mopping the baby with cloth after birth to clean, drying the baby immediately, skin-to-skin contact and bathing the baby after 24 hours were higher in institutional delivery than in home delivery and it were found to be statistically significant. Although initiation of breastfeeding within 1 hour and giving colostrum were also higher in institutional delivery than in home delivery, it were not found to be significant.

Table 1: Distribution of neonates according to age, sex and birth order

Characteristics		**Number**	**Percentage (%)**
Age (in months)	1-2	29	11.2
	3-4	86	33.5
	5-6	142	55.3
Sex	Male	133	51.8
	Female	124	48.2
Birth order	1	156	60.7
	2	83	32.3
	3 and above	18	7.0
Religion	Hindu	212	82.5
	Muslim	30	11.7
	Christian	15	5.8
Caste	General	52	20.2
	OBC	173	67.3
	SC	13	5.1
	ST	19	7.4
Type of family	Nuclear	81	31.5
	Joint	176	68.5
Socio-economic status	I	7	2.7
	II	25	9.7
	III	37	14.4
	IV	108	42.0
	V	80	31.1

Table 2: Distribution of mothers according to the number of antenatal visits and place of delivery

Characteristics		**No.**	**Percentage (%)**
Number of antenatal visits (including the first visit/registration)	0	3	1.2
	1	16	6.2
	2	9	3.5
	3	42	16.3
	4 and above	187	72.8
Place of delivery (N=257)	Institutional	251	97.7
	Home	6	2.3
Place of institutional delivery (N=251)	Public health facility	231	92.0
	Private health facility	20	8.0
Place of delivery in Public health facilities (N=231)	Tertiary health facilities	85	36.8
	Primary health facilities	146	63.2

Table 3: Distribution of neonates according to thermal care practices

Characteristics		**Number**	**Percentage (%)**
Cleaned after bath (N=257)	Mopping with cloth	253	98.4
	Bathing	4	1.6
Dried immediately (N=257)	Yes	253	98.4
	No	4	1.6
Wrapped immediately (N=257)	Yes	253	98.4
	No	4	1.6
Material used to wrap the newborn immediately (N=253)	Sterile cloth	251	99.2
	Unsterile cloth	2	0.8
Skin-to-skin contact given (N=257)	Yes	220	85.6
	No	37	14.4
Time of initiation of first bath (N=257)	<24 hours	4	1.6
	24 – 72 hours	45	17.5
	4- 7 days	77	30.0
	>7 days	131	51.0
Temperature of water used for first bath (N=257)	Warm	257	100.0
	Cold	0	0.0
Time of initiation of breastfeeding	<1 hour	189	73.5
	≥1 hour	68	26.5
Colostrum	Given	236	91.8
	Discarded	21	8.2

Table 4: Thermal care practices according to place of delivery

Characteristics		**Total**	**Baby cleaned at birth**		**p-value**
			Mopping	**Bathing**	
			Number (%)	**Number (%)**	
Place of delivery	Institutional	251	251 (100)	0 (0.0)	0.000
	Home	6	3 (50.0)	3 (50.0)	
			Baby dried immediately		0.000
			Yes	**No**	
			Number (%)	**Number (%)**	
	Institutional	251	251 (100)	0 (0.0)	
	Home	6	3 (50.0)	3 (50.00	
			Skin-to-skin contact		0.041
			Yes	**No**	
			Number (%)	**Number (%)**	
	Institutional	251	217 (86.5)	34 (13.5)	
	Home	6	3 (50.0)	3 (50.0)	
			Bath		0.000
			>24 hour	**<24 hour**	
			Number (%)	**Number (%)**	
	Institutional	251	250 (99.6)	1 (0.4)	
	Home	6	3 (50.0)	3 (50.0)	
			Initiation of breastfeeding		0.191
			<1hour	**>1 hour**	
			Number (%)	**Number (%)**	
	Institutional	251	186 (74.1)	65(25.9)	
	Home	6	3 (50.0)	3 (50.00	
			Colostrum		0.078
			Given	**Discarded**	
			Number (%)	**Number (%)**	
	Institutional	251	232(92.4)	19 (7.6)	
	Home	6	4 (66.7)	2(33.3)	

DISCUSSION: In the present study, it was seen majority of the

neonates (97.7%) were delivered at institution while 2.3% at home. The finding of the present study was comparable to Nimbalkar AS *et al.;* who observed that 93.7% were institutional delivery and 6.3% were home delivery [12]. However, a lower percentage of institutional deliveries were found by AHS 2012-13, DLHS-3(2007-08) , Mumbare SS.*et al.;* Singh B. and Sobti S., Dahal KR., Gandhi SJ *et al.;* and [8,11,13-16]

In the present study, among institutional delivery, majority of the neonates (92.0%) were delivered at public health facility while only 8.0% were at private health facility. According to AHS (2012-13) Assam, 54.6% mothers had delivered in the public health institution and 11.0% at private facility while in Dibrugarh district 54.7% deliveries took place at public health facilities and 26.5% at private health facilities [8]. The present study recorded a higher finding than the studies done by Mumbare SS *et al.;* in 2011, Garg R in 2010, Grover P and Chabbra P in 2012, Gandhi SJ *et al.;* in 2014 where they found that 49.1%, 55.7%, 32% and only 6.6% deliveries respectively took place at public health facilities [13, 16-18].The reason for high percentage of institutional delivery might be due to high number of antenatal visits by the mothers.

WHO (1996) recommends that newborns should be thoroughly dried immediately after delivery and kept warm. The newborn should be thoroughly dried with clean towel as soon as the head and body are delivered in order to prevent hypothermia. When the baby is wet after delivery, evaporation occurs and it leads to loss of body heat. Moreover, the stimulation which is produced during the process of drying the baby promotes breathing and thus prevents asphaxia in newborn [19]. In the present study, 98.4% neonates were cleaned by mopping with a cloth while 1.6% was given bath immediately in order to clean after birth. Singh JK *et al.;* in 2013 in their study in rural areas of Nepal observed that 62.5% neonates were cleaned with a dry cloth which is lower than the finding of the present study [20].

Regarding drying the baby at birth, 98.4% neonates were dried immediately after birth. The finding of the present study was somewhat similar to the study of Darmstadt GL *et al.;* in 2008) and Nimbalkar AS *et al.;* 2013 [21, 12]. However, a lower percentage was observed by Baqui AH *et al.;* in 2006 and Khanal V *et al.;* 2014 [22, 23]. The present study revealed that 98.4% neonates were wrapped immediately after birth. The finding of the present study was somewhat similar to study by Darmstadt GL *et al.;* 2008 [21]. But the study done by Baqui AH *et al.;* in 2006 and Khanal V *et al.;* 2014 showed a lower percentage than the present study [22, 23].

The present study observed in 99.2% neonates, sterile cloth was used to wrap immediately after birth. It was seen that a higher percentage was observed in the present study compared to the study done by Singh JK *et al.;* in 2013 in Nepal [20]. The reason might be due greater number of institutional deliveries in the present study.

Skin-to-skin contact is the placing of the naked baby on the mother's bare chest at birth or soon afterwards [24]. Skin-to-skin contact between mother and baby at birth improves mother-baby interaction, keeps the baby warm and helps women to initiate breastfeeding as early as possible and to maintain breastfeeding successfully [24]. In the present study, skin to skin contact was given to 85.6% neonates after birth. The finding of the present study was higher than the studies done by Hill Z *et al.;* in 2010 and Nimbalkar AS *et al.;* in 2013 who observed that only 7.9% and 17.5% neonates were given skin-to-skin contact respectively after birth [25, 12].

To prevent hypothermia of the newborn at birth, bathing should be delayed until 24 hours after birth. If this is not possible due to cultural reasons, bathing should be delayed for at least six hours [26].] Initially the baby should be given sponge bath, after the cord has fall and dried, full bath can be given with warm water [27]. In the present study, 98.4% neonates were given first bath after 24 hours which was comparable to Choudhary J *et al.;* in 2013 who revealed that 96.6% neonates were bath after 24 hours [36].[]However, Gandhi SJ *et al.;* in 2014, Baqui AH *et al.;* in 2006, Waiswa P *et al.;* in 2010, Saaka M. and Iddrisu M. (2014) observed that 6.85%, 3.9%, 1.2% and 62.2% neonates respectively were bathed after 24 hours [16,22,29,30]

Regarding temperature of the water used to bath, all the neonates (100.0%) were given bath with warm water. Similar observation was made by Gandhi SJ *et al.;* in 2014 in their study in rural areas of Navsari district, Gujarat [16]. To generate body heat in a newborn after birth, calories is required. At the early days after birth, breastmilk is the only source of providing the newborn with adequate amount of calories. So it is essential to breastfeed the newborn immediately after birth. Ideally, breastfeeding should be initiated as soon as possible after birth preferably within 1 hour. Colostrum, the first milk after birth is very important for a newborn. It is rich in nutrients and

antibodies and is all the nourishment and liquids a baby needs in the early part of his life. In the present study it was observed that 73.5% neonates were initiated breastfeeding within 1 hour. The finding of the present study was somewhat similar to AHS (2012-13) Assam (75.6%), DLHS-3 (2007-08) Dibrugarh (74.9%), Nayak S *et al.;* (70%), Yerpude P. and Jogdand K. (71.1%) and Katara PS *et al.;* (76%) [8, 11, 31-33].

In the present study, the healthy practice of colostrum feeding was followed in 91.8 % neonates which was similar to the study of Gandhi S J *et al.;* (90.9%) and Wadde SK *et al.;* (91.18%) [16, 34], but a higher finding was recorded by Saaka M. and Iddrisu M. (85.9%), Singh S. and Jain DC. (100%) [30,35]. A lower percentage was observed in studies done by Katara PS *et al.;* (87.0%), Mahmood SE *et al.;* (84.6%) and [30,35,36].

CONCLUSION:

The study revealed that correct thermal care was practiced in the rural area of Dibrugarh. Though the prevalence of correct thermal care practices was higher in the institutional delivery than in home delivery, every health care provider should be given adequate health education regarding thermoregulation of newborn so that they can provide the newborn the right environment to maintain the right body temperature. Behavioural change communication should be stepped in rural area regarding early initiation of breastfeeding and colostrum feeding.

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