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Traditional Massage of Newborns in Nepal: Implications for Trials of Improved Practice

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Abstract

Mustard oil massage of newborns is an integral component of traditional care practices in many communities. Recent evidence suggests that this practice may have detrimental effects, particularly for preterm infants or for those whose skin barrier function is otherwise sub-optimal. Other natural oils such as sunflower, sesame or safflower seed oil may have a beneficial impact on newborn health and survival. Little is known, however, about cultural and other factors related to the acceptance and uptake of alternative, more beneficial oils for massage of the newborn. A questionnaire concerning the usage and reasons for application of mustard and other oils to newborn skin was administered to the caretakers of 8580 newborns in Sarlahi district of rural Nepal. Four focus group discussions among representative groups were conducted to describe the perceived benefits of oil massage and the factors involved in the decision to apply oil. The potential for the introduction of alternative natural oils was explored. Approximately 99 per cent of newborns were massaged at least once with mustard oil in the 2 weeks after birth, and 80 per cent were massaged at least twice daily. Promotion of strength, maintenance of health, and provision of warmth were the most commonly cited reasons for application of mustard oil. Focus group discussion participants noted that smell, oiliness, mode of pre-massage preparation, and perceived absorptive potential on the skin are important contextual factors involved in the practice. Caretakers are willing to consider adaptation of established traditions for the promotion of positive health outcomes if essential contextual criteria are met. An understanding of cultural, social, and economic factors that shape the context of traditional healthcare practices is essential to the design and implementation of intervention trials examining the relative efficacy of application of oils in reducing neonatal mortality and morbidity.

Introduction

Of the approximately four million global neonatal deaths that occur annually, 98 per cent occur in developing countries, predominately in the home.[1,2] As most births and deaths occur outside any established healthcare facility, reduction in neonatal mortality may depend significantly on interventions involving promotion or adaptation of traditional care behaviors practised in the home. Feeding of colostrum, timing of initiation and duration of breastfeeding, umbilical cord care, and measures taken to prevent hypothermia of the newborn are important factors in health and survival during the neonatal period. Practices further removed from the immediate delivery and postpartum period have received less attention.

A common practice established in many communities, particularly throughout the Asian subcontinent is traditional oil massage.[3–5] While strong traditional practices, such as frequent application of natural oils to the newborn skin, presumably evolved due to perceived benefits,

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little has been documented concerning the actual benefits or detriments of this practice. Benefits may include improved skin condition, prevention of skin injury and skin infection, improved thermoregulation due to decreased transepidermal water loss, absorption of essential lipids, and enhanced maternal–infant bonding with repetitive tactile stimulation.[6–8] A study of four different oils (herbal, mustard, sesame, and mineral) compared with a non-treated control group demonstrated that sesame oil improved sleep patterns and growth (length, mid-arm, and mid-leg circumference) in 2-month-old infants.[3]

Evidence also suggests, however, that application of certain oils may have detrimental effects.[9] In addition to composition of the oil, newborn skin integrity and permeability, determined in part by baseline nutritional status and gestational age, play significant roles. A recent investigation of the impact of oil application on epidermal barrier function in a mouse model demonstrated that twice-daily mustard oil applications led to elevated rates of transepidermal water loss, delayed recovery of skin-barrier function, and structural changes in epidermal keratinocytes, indicative of stress and toxicity, compared with Aquaphor-treated and untreated controls.[9] Improved skin-barrier function, including reduced rates of transepidermal water loss, was observed in the group receiving sunflower seed oil applications, indicating that varying effects of specific fatty acids on structural integrity of the skin barrier may be an important factor in predilection for hypothermia, and risk of invasive infections.[9–11] Among preterm infants in Egypt, risk of invasive nosocomial infection was reduced by 48 per cent in infants who received oil massage with sunflower seed oil compared with controls.[12]

A prospective, community-based, randomized trial comparing topical oil applications to the skin of newborns is needed to examine the role of different oils in prevention of invasive infections, risk of hypothermia, and neonatal mortality. As the practice of using oil applications is fully ingrained in the cultural traditions of many communities, understanding the behavioral factors underlying this practice is essential to the design of an effective intervention trial. In Nepal, where approximately 90 per cent of births occur at home,[13] the use of mustard oil in newborn massage[14] and in application to the cut umbilical cord is common practice in many communities.[15] This investigation was designed to examine those socio-cultural and behavioral factors that would be essential to consider within the design of an intervention trial to determine the impact of behavior change to modify and enhance the benefits of newborn oil massage.

Materials and Methods

Both quantitative and qualitative methodologies were utilized to collect information on the prevalence, frequency, duration, and reasons for mustard oil or other oil applications to the skin of newborns in Sarlahi district of southeastern Nepal. The sample for the quantitative study was drawn from those newborns enrolled in an ongoing study of umbilical and skin cleansing with antiseptics. In that trial, pregnant women were enrolled in the third trimester and notification of outcome soon after delivery led to multiple follow-up visits to the newborn in the first 28 days after birth. Among 8706 infants enrolled between September 2002 and December 2003, information concerning oil massage and application to the umbilical cord at the time of birth was collected on 7951 (91.3 per cent) infants. Information on traditional newborn care practices during the first 2 weeks of life was collected from the mothers of 8580 (98.6 per cent) of the enrolled infants.

Qualitative data collection in December 2003 included four focus group discussions (FGD) among women from various representative groups. Selection of the groups was based on the major demographic trends of women enrolled in the trial, including caste and ecological zone of origin [hill or plains (*terai*)]. Approximately 71 per cent of the study population originate from the *terai*, with the major caste groups including Vaiysha (70 per cent), Sudra (16 per

cent), and Muslim (13 per cent). The remaining 29 per cent of the population originate from hill regions of Nepal, and consist of Vaiysha (50 per cent), Chhetri (20 per cent), Brahmin (20 per cent), and Sudra (10 per cent). The first FGD conducted (FGD1) included 11 women of Brahmin and Chhetri caste, originating from the hills. The second (FGD2) included seven women of non-Muslim *terai* origin, predominately from the Vaiysha caste. The third group (FGD3) included six women and one man of a Muslim *terai* community. The final group (FGD4) included 14 women members of the study team from a Brahmin and Chhetri-dominated community originating from the hills. Focus group discussions were conducted following an outline of major topics, including type and common usage of oils; reasons for applications; timing, frequency, and duration of oil massage in newborns; discussion of advantages and disadvantages of different oils and perceived benefits of oil massage for newborns; and factors important in the selection of massage oil. FGD1 and FGD4 were conducted in the Nepali language while FGD2 and FGD3 were conducted in Maitili and translated on-site into Nepali. Transcription and translation was conducted by one of the authors and a field co-ordinator based in Sarlahi. Transcripts were analyzed for predominant attitudes and practices related to oil application practices. Informal discussions and interviews were also conducted with key informants, such as shopkeepers and family members of study staff.

Results

Questionnaire data

Approximately 89.5 per cent (6835/7631) of mothers reported giving an oil massage immediately after the first bath, which occurred within 12 h of birth for 95 per cent of enrolled newborns. Twelve percent (956/7951) of newborns received an application of mustard oil to the umbilical stump immediately after the cord was cut, and 77.9 per cent received one or more cord applications of mustard oil during the neonatal period.

The practice of full-body massage with mustard oil to newborns is overwhelmingly prevalent in the study population, and the behavior persists across all ethnic, religious, cultural, or socioeconomic strata. Approximately 99.7 per cent (8553/8573) of newborns received some form of massage with mustard oil in the first 14 days of life, while almost 90 per cent (7610/8469) of babies were first massaged within 6 h of delivery. Mustard oil was usually applied two or three times a day (80 per cent, 6861/8540), and 99.1 per cent (8462/8540) of those reporting using mustard oil stated that it was used at least once a day. The most common reasons given for applying mustard oil to the skin of newborns are shown in Table 1.

Informal interviews and focus group discussions

Mustard oil is commonly used both for cooking and body massage. The newborn's mother almost always gives the massage, but grandmothers (maternal and paternal) are also often involved. FGD3 and FGD4 included mention of a specific sub-caste ('*chamain*') that is associated with giving oil massage (this caste is also associated with assisting during delivery). Often persons from this caste are called to the house to do the massage in exchange for a small amount of money, cloth, or food. Participants were in agreement that these persons 'never bring their own oil', but will use 'whatever oil is in the house'. Before giving an oil massage to a newborn infant, the baby is either washed (hill communities) or not washed (*terai* communities). Almost all participants in all FGDs stated that the oil must be prepared properly before use. Only very rarely will a newborn be massaged with oil that has not been heated, even during the hot season. A small amount of oil (approximately 15–30 ml) is usually heated, placed in a small finger bowl, and mixed with small pieces of garlic and spices (e.g. fenugreek, nutmeg, cloves, and caraway seed).

The entire body is massaged, often with considerable force. Women from FGD3 commented that the whole process is quite difficult for the babies, noting, 'they [the babies] always cry a lot because the massage is very strong'. One person suggested that persons of *terai* origin 'usually will use more force and stretch the babies' legs and arms more during the massage'. Women from FGD2 and FGD3 (*terai*) felt strongly that mustard oil should not be put in the eyes of the child during massage, as this 'would make the baby cry', 'would hurt', 'is not our tradition, makes the eyes red', 'makes the eyes swollen', or 'would make eyesight very weak'. On the other hand, women from FGD1 and FGD4 (groups of hill region origin) and other informal groups included the eyes ('helps the baby make tears'), the nose ('keeps the nose from drying out', 'makes breathing easier'), and the mouth as locations where small drops of oil should be placed at the end of the massage. Participants from the Muslim community suggested that putting some small drops in the nose ('prevents cough') and ears ('gets the dirt out') would be beneficial.

After the massage, the baby is wrapped in a cloth and either placed in the morning sun for a short while, or placed near a fire inside the house, with the former more likely in communities from *terai* origin and the latter being more prevalent in the cold season. Almost everyone suggested that for newborns, it was important to do the massage at least twice a day, and in the cold season, perhaps even more frequently. There was less agreement on whether the sweating of the baby when placed in the sun after massage was beneficial or harmful. Possible benefits included 'it gets the cold out of the baby', 'it cleans the skin of the baby', and the 'heat and sweat makes the baby's bones strong', while potential harmful consequences included 'it causes weakness' and 'sweat is not good for babies'. Women in the Muslim group commented that although the sweating is bad for the babies, the benefits of the sun outweigh the potential harm.

During both focus groups and informal discussions, the quality of the mustard oil was mentioned as a key factor. It was stressed that for babies, pure oil must be used because non-pure mustard oil could be very harmful to the baby's skin. There was some disagreement on good sources of pure mustard oil. For example, while some people favored a local producer or small-scale businessman over the commercially available packets ('there are many chemicals added to this'), others argued that the local business people sometimes also 'mix cheap oil into the good oil, and sell it at a high price'. A number of people mentioned that when a baby is born, a good source of pure oil would be set aside in a special container, and not 'wasted on cooking' or massages for older children or adults. Apparently, the price has less to do with quality than the level of 'trust' associated with the place of purchase or production.

Some characteristics other than point of purchase that could be used to determine the quality of the oil included smell, taste, color, thickness, and appearance upon heating ('if there are many bubbles when heating, the oil is not good'). Also, the stickiness of the oil after application was an important indicator of its quality. If the child's skin is sticky ('like gum') 1 or 2 days after application, then the quality is 'very bad'. Participants in FGD1 stressed that the cleanliness of the oil and the container in which it was stored, or even the hands that used the oil, could be important factors in changing oil from pure to non-pure, while in the Muslim group, there was little indication that factors in the household could affect the purity of the oil.

Sunflower seed oil is not often thought of as useful for massage, and is rarely used in this way, largely due to the more widespread availability of mustard oil. Those that had used sunflower seed oil suggested that it was less greasy (positive), but that it did not have a very nice smell or taste (negative). Opportunity was given during the discussion groups to try massaging sunflower seed oil into the skin of a newborn. Participants from FGD1 were very eager to try another oil, noting that the color of the oil (gold vs. clear) was not a concern for them, nor was smell, taste, or degree of oiliness; all factors that are significantly different between the two

oils. Other participants (FGD2) were more hesitant about substituting mustard with sunflower seed oil, noting that the thinner consistency and smell of sunflower seed oil were associated with non-pure mustard oil. Smell was initially an important factor for Muslim women (FGD3), but they were willing to try sunflower seed oil for massage 'if it is good for the baby'. After trying out the sunflower seed oil, participants suggested it was as easy to apply to the skin as mustard oil, and stated, 'the oil is just as oily as mustard oil', or 'it went straight into the baby's skin and [therefore] is good for the baby'. Participants suggested that the baby's skin did not remain oily for long when using the sunflower oil, noting, 'Less dust and dirt sticks to the [baby's] skin'. Some participants mentioned that they would discontinue using a substitute oil if the child became 'cold' or 'sick', developed a skin infection because of the substitute oil, or if 'it did anything harmful' to the baby. A woman from the Muslim FGD commented, 'After 1 week, we will know if it is good oil'.

Discussion

The use of mustard oil for newborn massage is an almost universal (>99 per cent) practise among communities in Sarlahi district, in agreement with data previously collected from Bangladesh.[4] In Sarlahi, perceived benefits of strength, warmth, and protection from infection may indeed be realized through this practice.[10–12] Full body massage with oil may, however, be harmful to the newborn, depending on the oil used and how it is applied. Recent evidence demonstrating that mustard oil significantly increases both the rate of transepidermal water loss and recovery of skin integrity after injury[9] suggests that a significant number of newborns in the region, for example approximately 700 000 babies per year in Nepal, may be exposed to a harmful practice. Data from FGDs and informal interviews indicate that although the practice is an integral part of traditional care provided to the newborn, the potential for adapting the practice exists. When designing a trial to test the efficacy of different oils in protecting the infant from hypothermia, infection or death, the importance of factors such as smell, oiliness, taste, and color may vary considerably by sub-population, and must be taken into account. Mode of preparation of the oil, persons responsible for carrying out the massage, and frequency of application must also be considered when attempting to adapt the practice through substitution of an alternative oil. Communities may consider adaptation of established traditions for the promotion of positive health outcomes if essential contextual criteria are met. An understanding of cultural, social, and economic factors that shape the context of traditional health-care practices is essential to the design and implementation of intervention trials examining the relative efficacy of the application of oils in reducing neonatal mortality and morbidity.

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Table 1

Reasons for giving neonatal oil massage, by season

Reason*	Cold, % (*n* = 1472)	Moderate, % (*n* = 3472)	Hot, % (*n* = 3371)	Overall, % (*n* = 8315)
To make the baby strong	64.2	68.6	72.5	69.4
To keep the baby healthy	51.5	48.8	49.3	49.5
To keep the baby warm	53.0	44.4	31.9	40.8
To make the baby's skin look good	21.7	25.3	22.7	23.6

Cold: December–February; Moderate: March–April, October–November; Hot: May–September.

*Multiple reasons given per respondent.