

ORIGINAL ARTICLE

Mothers' Knowledge about Diaper Rash and Preventive Measures in Bangladesh

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Abstract

Background: Use of disposable diapers by parents for their children has grown in last few decades. Although, most of the time diaper rash is not life threatening, it is a concern for the parents, and uncomfortable and painful for children

Objectives: To measure the knowledge and practice of mothers when diapering and administering perineal care to infants wearing disposable diapers and factors that can influence the frequency of the occurrence of diaper rash in children between 0-12 months in Bangladesh.

Methods: This cross-sectional study was conducted during the outpatient visits of mothers and their infants at the Combined Military Hospital located in Cumilla, Bangladesh between 01 February 2015 and 31 July 2015 with their infants. A structured, self-completed, closed-ended questionnaire was provided to 110 mothers who came to visit the Pediatric outdoors.

Results: Thirty-seven (33.64%) infants aged one or under were reported to have experienced diaper rash during or prior to enrolment in the study. Study analysis showed that the risk of diaper rash was significantly higher in babies who used only 1-2 diapers/day than for babies who used more than 4 diapers/day (40.0% vs 21.43%). Infants whose mothers had knowledge of the causes and preventions of diaper rash and/or who received information about the importance of the proper cleaning of the diaper area during diaper changes suffered fewer incidents of diaper rash than those whose mothers did not (24% vs 36.48%). The causes of diaper rash were described by 48.65% mothers as heat followed by 27.03% mothers by frequent stool/urine.

Conclusion: Frequently changing disposable diapers and cleaning the diaper area thoroughly can reduce cases of diaper rash dramatically in children less than one year old. The knowledge of mothers regarding diaper rash is an important factor in reducing diaper rash in their children.

Keywords: Diaper dermatitis, diaper rash, nappy rash, infant, child care.

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Received: 8 December 2019;

Accepted: 24 March 2020

Introduction

The skin is the outermost and the largest organ in the human body and provides many vital functions including protecting internal organs, maintaining water and electrolyte balance by secretion and absorption, thermoregulation, and sensation.¹ In order to maintain these functions, it is important to take care of the skin properly.² The skin structure of infants is very distinctive as their skin is exceptionally delicate and can break easily; the improper cleaning of infant skin coupled with an insufficient knowledge around the care of the bottom might compromise the integrity of that delicate area of their skin.³ It is important that the skin care products that parents use to clean their babies' diaper area are appropriate for their skin as infant skin continues to mature through the first years of life.⁴

Infants are generally not trained to evacuate in the toilet themselves and are not able to communicate with parents when they want to evacuate. Many parents use diapers to prevent soiling and also for convenience. Infrequent changing of diapers and the improper cleaning of the diaper area can result in the presence of urine and stool in the diaper area for extended periods, leading to diaper rash. For the purpose of this paper, the term 'infant' is used for children aged between birth and 12 months of age.⁵

Diaper rash, which is also called nappy rash or diaper dermatitis, can be defined as a number of inflammatory skin conditions that can occur at the diaper area.⁶ For the purpose of this study, it will be called diaper rash or diaper dermatitis. Diaper rash is the cause of 20% of dermatology consultations during childhood.⁷ Generally, diaper rash is not a life-threatening condition, but it can be severe and painful for babies and a concern for their parents and might need a physician's assessment.⁸ Prolonged skin wetness from urine and/or stool can cause or aggravate diaper rash. Fecal protease and lipase enzymes and irritants from urine and stool can cause skin damage, which can result in diaper rash.⁹ The rash can appear in any area, such as the genitals, perineum, medial side of thigh, or buttocks.¹⁰ The objective of the study is to determine the knowledge and practices of mothers regarding the use of diapers and diaper rash among their babies.

Materials and Methods

This study was conducted in the outdoor of the Paediatric Unit of the Combined Military Hospital in Cumilla, Bangladesh between 01 February 2015 and 31 July 2015. Participants of this study were mothers who came to the hospital's pediatric outdoor with their children for any reason. The inclusion criteria for the participants were: first time mothers (primi) with babies who were one or less than one year old, mothers who agreed to participate in the study willingly, babies who wore disposable diapers day and night for at least 20 hours per day and babies who were not affected by any congenital diseases. Exclusion criteria included: babies so severely ill that they needed admission to the hospital.

A structured, self-completed, closed-ended questionnaire was provided to mothers to fill out. The questions were written as simply as possible so that the mothers could be able to understand. Mothers could only check off one box to answer each question. The questionnaire collected information on eight variables: the gender and age of babies, maternal education level, maternal age, breast-fed vs bottle fed, the number of diaper changes every day, the frequency of cleaning the diaper area during diaper changes, and if the mother received any information regarding diaper rash as part of her antenatal care. A simple statistical analysis was performed to measure the prevalence of diaper dermatitis. Data were recorded using Microsoft Excel Spread Sheets and the SPSS statistical package, version 17.0 for Windows, was used to analyze the statistics. A *p*-value <0.05 was considered to be statistically significant. Comparison among groups was conducted using the χ^2 test. Results are presented in the article using tables and texts.

Information regarding the material the mother used to clean the diaper area during diaper changes as well as if perineal hygiene was performed and the sources from where they received any information regarding diaper rash (if it was received) were also included in the questionnaire. Mothers were informed of the purpose of the study and were also informed that the study did not have any intervention aspect. They were informed that all the answers would be anonymous and their participation or lack of participation in the study would not affect any treatment options or opportunities for their children. For the purposes of this study, only infants wearing

disposable/one-time use diapers were included. This study showed that babies who used the same diaper for extended periods of time had the highest prevalence of diaper rash and many mothers did not know that the frequent changing of diapers and cleaning the diaper area might reduce the occurrence of diaper rash in their babies.

Results

Thirty-seven (33.64%) infants aged one or under were reported to have experienced diaper rash during or prior to enrolment in the study (Table I).

Out of 110 mothers, 41.82% were at the age of 20-24 years followed by 36.36% participants were between

15-19 years. Diaper rash among the infants of mothers with those age ranges were as 42.50%, 34.78, and 16.67% respectively. Though the highest education (68.18%) of mothers recorded up to class 6-9 followed by class 10 and above, but incidence of highest numbers of diaper rash was found among the infants of lower class educated mother (class 1-5). Maximum (38.46%) infants belonged to the 5-8 months age had higher diaper rash. Univariate analysis showed that diaper rash is significantly associated with the age and education level of the mother as well as the age of baby ($p < 0.05$ for all comparisons), but not with the gender of the baby (Table II).

Table I

Distribution of participants (Infants 0-12 months) according to diaper rash (N=110)

Number of babies	Infants had diaper rash		Infants never had diaper rash	
	Number	%	Number	%
110	37	33.64	73	66.34

Table II

Distribution of maternal age, educational level and age and gender of the child

Age of mother in years	Frequency	Percentage (%)	Infants had diaper rash Number (%)	p value
15-19	40	36.36	17(42.50)	<0.05
20-24	46	41.82	16(34.78)	<0.05
25 and above	24	21.82	04(16.67)	
Total	110	100.00	37	
Education of mother in class(grade)	Frequency	Percentage (%)	Infants had diaper rash Number (%)	p value
Class 1- 5	15	13.64	06(40.00)	<0.05
Class 6- 9	75	68.18	26(34.67)	<0.05
Class 10 & above	20	18.18	05(25.00)	
Total	110	100.00	37	
Age of child in months	Frequency	Percentage (%)	Infants had diaper rash Number (%)	p value
0- 4	50	45.45	14(28.00)	<0.05
5-8	39	35.45	15(38.46)	<0.05
9-12	21	19.10	08(38.10)	
Total	110	100.00	37	
Gender of child	Frequency	Percentage (%)	Infants had diaper rash Number (%)	p value
Female	49	44.55	17(34.69)	
Male	61	55.45	20(32.79)	>0.05
Total	110	100.00	37	

Mothers who changed their infant's diapers 1-2 times a day had 40.0% incidents of diaper rash and those whose babies were changed more than 4 times a day experienced diaper rash by only 17.64%. Mothers who breast-fed their infants had only 22.5% diaper rash and 63.3% who did not (Table III).

Assessed if mothers had any knowledge regarding diaper rash and it was reported that only 25 mothers

out of 110 mothers had knowledge of diaper rash and 85 mothers did not (Table IV).

Surveyed the sources of diaper rash education for the 25 mothers and it showed that 11 (44%) mothers received information from their family members and 10 (40%) mothers received information from physicians or other health-care workers (Table V).

Table III

Distribution of frequency of usage of diapers every day, frequency of cleaning during diaper changes, cleaning material used most of the time during diaper changes and diet of infants (N=110)

Variable	Number of babies	Infants had diaper rash Number (%)	p value
Number of Diapers use/day			
1-2 diapers/day	45	18(40.00)	<0.05
3-4 diapers/day	48	16(33.33)	<0.05
>4 diapers/day	17	03(17.64)	
Total	110	37	
Cleaning frequency during diaper changes			
Every time or most of the time cleaning during diaper change	30	07(23.33)	
Most of the time not cleaning diaper area during diaper change	80	30(37.5)	<0.05
Total	110	37	
Materials used to clean			
Commercial wipes	09	04(44.44)	<0.05
Wet cloth	58	18(31.03)	
Water	40	12(30.00)	
Others/nothing	03	03(100.00)	<0.05
Total	110	37	
Mother breast fed during diaper rash			
Yes	80	18(22.50)	
No	30	19(63.33)	<0.05
Total	110	37	

Table IV

Mothers received information regarding diaper rash and/or care (N=110)

Mother received information regardingdiaper rash /and care	Number of Infants	Infants had diaper rash Number (%)	p value
Yes	25	6(24.00)	
No	85	31(36.47)	<0.05
Total	110	37	

Table V
Sources from where mother received information regarding diaper rash (N=25)

Source	Number	%
Family members	11	44
Friends	04	16
Physician/health care workers	10	40
Others	0	0
Total	25	100

The table shows perceptions of mothers regarding the causes of diaper rash in their children; 18 (48.65%) mentioned heat, 3 (8.11%) not changing diapers for a long time, 10 (27.03%) frequent stool or urine, types of diaper 2 (5.41%), not cleaning diaper area during diaper change 1 (2.7%) and 3 (8.11%) mothers mentioned they did not know the reasons (Table VI).

Table VI
Distribution of aetiology of diaper rash amongst the infants (N=37)

Causes of diaper rash	Number	%
Heat	18	48.65
Wet diaper for a long period	03	08.11
Frequent stool/urine	10	27.03
Types of diaper	02	5.40
Not cleaning during diaper change	01	2.70
Don't know	03	8.11
Total	37	100.00

Discussion

Children one year or less were selected as subject participants for this study, as it was proved that most of the diaper rash was found in children in this age range.¹¹

According to this study, more than one third of participated children who suffered at least one incident of diaper rash, were one year old. Philipp et al. conducted a study on diaper rash in the United Kingdom (U.K.) and reported in 1997 that 25 % of the children who participated in the study experienced diaper rash during the first four weeks of their lives.⁷

Diaper rash is a common condition in children, as it is a condition that is seen in infants as frequently as from 7% to 35%.¹² In the present study, the prevalence was found to be 33.64%, which is on the higher side of the average prevalence rate that was mentioned by Weston et al¹². Gender did not produce significant differences in the number of cases of diaper rash; the finding for female vs male was 34.69% vs 32.79%. It can be mentioned here that in 1983, Harpin et al¹³ investigated skin barrier function of infants by assessing transepidermal water loss (TEWL) of infants and they did not find any influence of gender on skin barrier function maturation.

Infants of mothers who had educational level grade (1-5) had the highest prevalence of diaper rash at 40%. This was followed by mothers with educational level grade (6-9), which was 34.67% and the lowest in infants of mothers who had higher level of education at least grade 10 or higher (25%). These numbers prove that the level of education influenced the incidence of occurrence of diaper rash which is also supported by Eke et al¹⁰. This finding is also consistent with the finding of Philipp et al¹⁷. But the results of another study which was conducted in 2012 by Li et al¹⁴ in China, is inconsistent with the result of the present study regarding this matter.

It is also noticeable that mothers who were breast-feeding their children had less diaper rash than the children who were formula fed (22.5% vs 63.3% respectively). These statistics support the research that was conducted by Yoshhioka et al¹⁵ in 1983.

The reason was explained as the pH of feces of breast-feeding infants is lower than the pH of feces of formula-fed infants, therefore reducing the potential irritation of infants' skin.¹⁶ It can be mentioned here that the World Health Organization (WHO) recommends mother to breast feed exclusively up to 6 months of age of their babies.¹⁷ Studies also proved that breast feeding can be an effective measure to reduce the occurrence of diaper rash in children.

To understand the practices of mothers during diaper changes, the number of diaper changes in a day were assessed. The results found that the prevalence of diaper dermatitis was lowest (21.43%) when mothers changed their infant's diaper more frequently (more than 4 diapers/day in the present study). Previous

research also found that there was a direct association between diaper rash and the frequency of diaper changes.^{10,18} With the present results and those of previous studies, it is established that longer time-exposure of children's skin to urine and/or stool directly effects occurrence of diaper rash. Current research also explored whether or not mothers cleaned the diaper area of their babies every or most times when changing their infants and what they used to clean the diaper area. It was explained to the mothers that "most of the time" meant not cleaning the area a maximum of one time of the total number of times they changed their baby's diaper per day. Results showed that the prevalence of diaper rash in the infants of mothers who performed perineal hygiene most of the time were significantly less than in the babies of the mothers who did not clean the diaper area during diaper changes. The fewest cases of diaper rash were found among the infants who were cleaned by wet clothes or water rather than using commercial wipes.

Efficient knowledge of mothers or caregivers regarding diaper rash can reduce or prevent it.¹⁹ The present study found that 24% of the infants who had diaper rash had mothers who had received knowledge regarding diaper rash, as opposed to the infants of mothers who did not receive that knowledge and who formed 36.48% of the group. When exploring the sources of information, the most two important sources were reported as family members and health-care workers.

Mothers were given an opportunity to share their perceptions about the causes of diaper rash. Only 8.11% of mothers mentioned the infrequent changing of diapers and 2.70% mentioned not cleaning the diaper area during diaper changes, 8.11% did not have any idea why their children had diaper rash. This demonstrates the importance of educating mothers and caregivers regarding diaper rash in order to reduce the frequency of diaper rash in children.

This study also demonstrated that the education of mothers was also an important factor of reducing diaper rash in children, as the children of mothers who studied until at least class 10 suffered a lower percentage of cases of diaper rash compared to mothers who were less educated. Children of mothers who received information regarding diaper rash also suffered significantly less numbers of diaper rash than the children of mothers who did not. From

the discussion above it can be recommended that educating mothers and breast-feeding children can be very effective measures to reduce or prevent diaper rash in these children.

One of the two limitations of the study was the small sample size of the study. One of the barriers to achieve higher participants was the inclusion criteria that mothers had to read, write and speak Bengali. Unfortunately, many young primi mothers could not fulfill these criteria.

Another limitation was not including the financial situation of the mothers as a variable. To buy diapers or cleaning products is an extra burden for many families in developing countries. Research had to exclude this variable, as many mothers could not tell the monthly income of their families or did not want to disclose it. In future studies, these factors should be taken in account.

Conclusion

Diaper rash is a common but preventable condition in infants. The proper knowledge of mothers or caregivers regarding diaper rash, maintaining proper hygiene in the diaper area during diaper changes and frequent changes of diapers can be effective ways to reduce or prevent diaper rash in infants. Health-care workers, including physicians, nurses, and medical assistants, should take responsibility to inform mothers about childcare, including the care of the diaper area, during mothers' visits to health-care institutions.

Acknowledgements

The parents and children at the Combined Military Hospital of Cumilla for participating in this study and also the authority of the hospital for giving the opportunity to conduct this study.

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