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Hazards of Wearing Diaper among Infants

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Summary:

Background: The use of disposable diaper is gradually increasing for the infants in our country. However, the major hazard of diaper is diaper dermatitis. The magnitude of diaper related hazards is unknown in Bangladesh. This study was conducted to assess the frequency of hazards of wearing diaper among infants.

Objectives: The study was conducted (i) to observe diaper related hazards among infants and (ii) to assess the factors affecting diaper related hazards.

Materials and Methods: This observational study was conducted at department of Pediatrics of Dhaka Medical College Hospital & Bangabandhu Sheikh Mujib Medical University during May to September 2012. Fifty children aged 7 days to 12 months wearing disposable diaper for at least 7 days were enrolled in this study. A face to face interview was taken and finding were recorded on a preset questionnaire. The infants were also examined for presence of diaper rash. Obtained data were analyzed thoroughly by SPSS 21.

Results: Among 50 children, 24(48%) male and 26(52%) female infants. Of them 13(26%) infants developed diaper rash in their diaper wearing time. The age distribution of the cases was 3(23.1%) below 01 months; 2(15.3%) 1-6 months and 8(61.6%) 7-12 months. Six (24%) male infant and 7(27%) female infant developed rash in their diaper wearing time. Diapers are mostly used by solvent families as diapers are not cost effective. The frequency 84.6%, increases with increased duration of using a single diaper at a time for more than 4 hours without change whereas those who changed diaper more frequently every 3-4 hours and 1-2 hours have diaper rash 15.4% and 0% respectively.

Conclusion: From the result of the present study it can be concluded that the frequency of diaper rash is increased with increasing age of infants and use of diaper for long duration.

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Introduction:

Diapers have been used for care of babies since decades to prevent soiling and for social convenience[1]. But, Diaper rash is one of the most important hazards of wearing diaper[1-2]. It is also known as Diaper dermatitis or nappy rash which describes any inflammatory eruption of the skin in the diaper area caused by wearing diaper[1-3].Theuse of disposable diaper for the infants isincreasing day by day for children who are not yet potty trained or experience bedwetting[1]. But most of the parents are not concerned about hazards of diaper[3].About one in two of all infants suffer from diaper rash at some point of infancy with peak prevalence at 9-12 months[4].

Diaper dermatitis is caused by a combination of factors[5,6]. Infants delicate skin, moist occlusion following urination, frequent loose motion in the diaper causes over-hydration of the skin – i.e. prolonged wetness of the skin makes it more prone to damage[4-6]. Skin pH is increased in the diaper area as fecal bacteria produce ammonia from urinary urea, thereby increasing skin permeability to low molecular weight irritants and increasing the activity of fecal enzymes [6-9]. These factors predispose the skin to opportunistic infection by fecal microbes such as *Candida albicans* hereby causing a more severe and chronic diaper dermatitis[10].

Diaper should be changed often at least every 3-4 hours to prevent it from rashes[11]. Diaper rash is the most common dermatitis found in infancy. Prevalence has been variably reported from 4-35% in the first 2 years of life.[12,13] Besides, infants stay dry due to super absorbing criteria of diaper which keep them away from common cold and other related health problems [14,15].

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Objectives: The study was conducted (i) to observe diaper related hazards among infants and (ii) to assess the factors affecting diaper related hazards.

Materials and Method:

This observational study was conducted at the department of Pediatrics of Dhaka Medical College Hospital and Bangabandhu Sheikh Mujib Medical University, Bangladesh. Fifty consecutive children aged 7days to 12 months of Inpatient or Out Patient Department fulfilling inclusion criteria were enrolled as cases. An informed written consent was obtained from parents. These parents underwent face to face interview using a preset questionnaire. The questionnaire collected information on few variables that are known or suspected to be associated with diaper rash: age, gender, maternal service, family income, frequency of diaper change. Infants diaper area was also examined for presence of any rash and at the same time any parents describes rash in diaper area in last 6 weeks were included as case of diaper rash. Obtained data were analyzed by SPSS21.

Inclusion criteria

1. Patients started to use diaper at least for 7 days.
2. Age range- 7 day to 12months.
3. Use commercially available disposable diapers.

Exclusion criteria:

1. Patient using medicated nappy cream or baby lotion containing zinc oxide.
2. Infants having any skin infection other than nappy rash, e.g. scabies.

Results:

A total 50 children were enrolled in this study: 24(48%) boys and 26(52%). Out of 50 cases 13(26%) infants developed diaper rash during their diaper wearing time. The age distribution of the cases was 3(23.1%) below 01 months; 2(15.3%) 1-6 months and 8(61.6%) 7-12 months. Six (24%) male infant and 7(27%) female infant developed rash in their diaper wearing time.

Among the infants who developed diaper rash 11(84.6%) cases wore diaper for more than 4 hours, without changing. Besides, 02(15.4%) and 0% developed rash who wore single diaper for 3-4 hours and 2-3 hours without changing respectively.

Table-I

Relation between age and Diaper rash (n=50)

Age (months)	Cases (N=50)	Diaper Dermatitis	p- value
<1	20 (40%)	3(23.1%)	<0.05[s]
1-6	8(16%)	2(15.3%)	
7-12	22(44%)	8(61.6%)	

Table 1: The age distribution of the cases was 3(23.1%) below 01 months; 2(15.3%) 1-6 months and 8(61.6%) 7-12 months. Frequency of diaper rash increases with increased age of the infant at 7-12 months of age which is statistically significant (p – value <0.05) in comparison to age 1-6 months.

Table-II

Relation between sex and Diaper rash (n=50)

Sex of the user	No. of user	No. Diaperrash
Male	24	6(25%)
Female	26	7(27%)

Among 50 children, there were 24(48%) male and 26(52%) female infants.

Male : Female ratio = 1:1.1. There was no relation between gender and diaper rash (Table 2).

Table-III

Association of diaper rash with frequency of changing diaper (n=13)

Frequency of changing (hours)	Frequency	Percentage	p-value
>4 hours	11	84.6	<0.001[s]
3-4 hours	2	15.4	
2-3 hours	0	0.0	

Table-III: Shows the association between frequency of diaper change and diaper rash. Those who wore a single diaper without changing for a prolonged period of more than 4 hours at a time developed diaper rash 11(84.6%) cases which is statistically significant (p – value <0.001) in comparison to <4 hours.

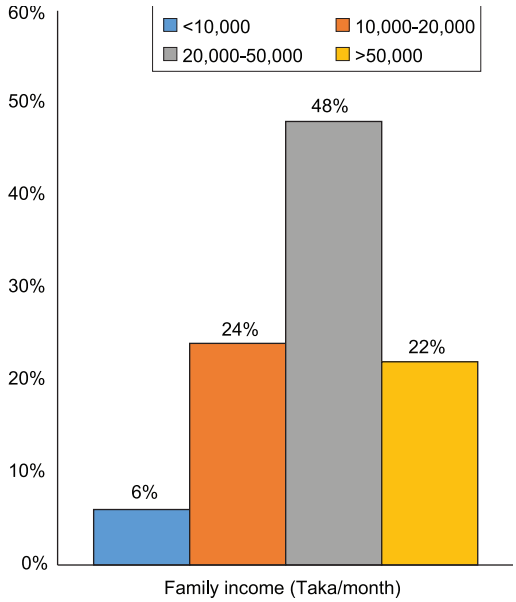

Fig.-1: *Socio-economic status (family income) of diaper users*

Fig.-1: Shows the relation between Socioeconomic status and diaper use. Most of them are used by the parents with family income around 50,000/month. <10,000, 10,000-20,000, 20,000-50,000 and >50,000 used diaper at a rate 6%, 24%, 48%, 22% respectively.

Discussion:

Diaper rash is one of the most common skin hazards of wearing diaper among the infants. In this study, the frequency of diaper rash, age and sex distribution of the cases common age of presentation and factors affecting rashes were observed. Diaper rash was found to be present in 26% of cases at 7-12 months which is similar to study result of Scowen[5]. Mauricio[9] also found increased frequency of diaper rash at 6-12 months. Philipp[2] and Nield[15] found peak frequency at 9-12 months and total incidence 26% is also similar to them. Increasing age of infant increased the chance of diaper rashes. Philipp[2] also reported that newborn develop diaper dermatitis 25% of all diaper rashes, here it is 23.1%. There were so many factors contributing diaper dermatitis like thin layered soft skin, continuous use of diaper and use of systemic antibiotics causing death of normal flora and increase susceptibility to Candida infection.

No sex predilection was found in the current study. Li[11], Serdaloglu[16] and Philipp[2] also reported no sex difference in their study.

In this study, among the infants who developed diaper rash, 84.6% used a single diaper continuously for a period of more than 4 hours without changing. 15.4% and 0% infants developed diaper rash after using a single diaper at a time for 3-4 hours and 1-2 hours respectively which match with the study of Nield[15], Serdaloglu[16] and Adalat[14]. Nield[15] found that the prevalence of diaper dermatitis significantly decreased of nappy changes of e" 6 times/day compared with less frequent nappy changing. Serdaloglu[16] suggested in his study that diaper should be changed at least every 3-4 hours.

This study is in agreement with above researches and makes the recommendation that the diapers should be changed at least every 3-4 hours to avoid diaper dermatitis.

Conclusion:

The frequency of diaper rash was found to be increased with increasing age of infants and its prolong use without changing.

Limitations:

The study was conducted at only two institute of Dhaka city which may not reflect the situation of whole country. Study period was short and population were small.

References:

1. Prasad HR, Srivastava P, Verma KK. Diaper dermatitis—an overview. Indian J Pediatr. 2003 Aug; 70(8):635-7.
2. Philipp R, Hughes A, Golding J, et al. Getting to the bottom of nappy rash. ALSPAC Survey Team. Avon Longitudinal Study of Pregnancy and Childhood. Br J Gen Pract.1997 August; 47(421):493-7.
3. Prasad HR, Srivastava P, Verma KK. Diapers and skin care: merits and demerits. Indian J Pediatr. 2004; 71:907-8.
4. Atherton DJ, et al. The aetiology and management of irritant diaper dermatitis. J EurAcadDermatolVenereol. 2001; 15(1):1-4.
5. Scowen P. Nappy rash: let's give mother more help. Professional care of mother and child.2000;10(1): 26-8,30.
6. Adalat S, et al. Diaper dermatitis- Frequency and contributory factors in Hospital attending children. Pediatric Dermatology. Oct 2007;24(5):483-88.
7. Stamatous GN, et al. Diaper dermatitis: etiology, manifestations, prevention and management. Pediatr Dermatol. 2014;31(1):1-7.
8. Scheinfeld N. Diaper dermatitis: a review and brief survey of eruption of the diaper area. Am J Clin Dermatol. 2005;6(5):273-81.

9. Mauricio Odio, and Lauren Thaman. Diapering, Diaper Technology, and Diaper Area Skin Health. Pediatric Dermatology. 2014;31(1):9–14.

10. Ferrazzini G, Kaiser RR, Hirsig Cheng SK, et.al. "Microbiological aspects of diaper dermatitis". Dermatology (Basel). 2003; 206(2):136-41.

11. CH Li, ZH Zhu, YH Dai. Diaper dermatitis: A survey of risk factors for Children Aged 1-24 Months in China. The Journal of International Medical Research. 2012; 40: 1752 – 60.

12. Alberta L, Sweeney SM, Wiss K. Diaper dye dermatitis. Pediatrics. Sep 2005;116(3):450-452.

13. Prasad HR, Srivastava P, Verma KK. Diaper dermatitis – an overview. Indian J Pediatr. Aug 2003;70(8):635-637.

14. Adalat S, et al. Diaper dermatitis- Frequency and contributory factors in Hospital attending children. Pediatric Dermatology. Oct 2007;24(5):483-88.

15. Nield LS, Kamat D. Prevention, diagnosis and management of diaper dermatitis. ClinPediatr (phila).2007 Jul;46(6): 480-6.

16. Serdaroglu S, Ustenbas KT. Diaper Dermatitis (Nappy Dermatitis, Nappy Rash). J Turk. AcadDermatol 2010; 4(4):04401r.