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Original Research Article

A clinico-aetiological study of diaper area dermatoses in children

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ABSTRACT

Background: Diaper area dermatoses is a broad term used to describe various skin conditions that can occur in diaper area. Dermatoses in diaper area can occur as primary disease, as part of a generalised inflammatory skin disease, or as part of a systemic disease.
Methods: One hundred and thirty children below five years with eruptions involving the diaper area were enrolled in the study. A detailed history, general physical examination and dermatological examination was done and recorded in a proforma. Tests such as Tzanck smear, skin biopsy, KOH preparation, culture sensitivity, Gram staining and appropriate hematological investigations were done whenever necessary depending on the presenting condition.
Results: A total of twenty three (23) various dermatoses were encountered. Irritant contact dermatitis (22.3%) was the most common dermatoses, followed by scabies (14.6%), impetigo (13.8%) and papular urticaria (11.5%). Aetiological analysis revealed that majority (28.5%) of dermatoses belonged to infection group followed by inflammatory (26.15%) and arthropod bite (26.15%) groups. Amongst the infective dermatoses, bacterial infection (14.61%) was most common entity followed by viral (10.76%) and fungal infection (3.1%).
Conclusions: Our study emphasizes various dermatoses in diaper area in paediatric population and proves that aetiology is multifactorial and is not because of diaper alone.

Keywords: Diaper area dermatoses, Irritant contact dermatitis, Scabies

INTRODUCTION

Diaper area dermatoses is a broad term used to describe various skin conditions that can occur in diaper area.[1] Eruptions in the diaper region have diverse origins. Many lesions like vesicles, pustules, bullae, erosions and ulcerations may arise in the diaper area.[2] The anatomical area for diaper dermatoses encompasses the lower abdomen, lower lumbar region, gluteal area, genitalia and inner aspects of thigh. Eruptions in the diaper area are the most common dermatological problem in infancy.[3] There are many diseases that may also involve other areas of the body and coincidentally affect the diaper area. These eruptions can be subdivided into primary diaper area dermatitis, an acute inflammation of skin in diaper area with an ill-defined and multifactorial aetiology, and secondary diaper area dermatitis, a term which encompasses eruption in diaper area with defined aetiologies. The most important factors in development of primary diaper area dermatitis are water, moisturizer, friction, urine, feces, microorganism. Secondary diaper area dermatitis includes a variety of other inflammatory and infectious processes that can occur in the diaper area.[3] Diaper area dermatoses can be directly related to the wearing of diapers, those aggravated by wearing diapers, and those that occur in the diaper region

irrespective of whether diapers are worn or not.[4] The lesions over diaper area in an infant or child causes panic in parents. An early and accurate diagnosis of these disorders will help the dermatologist to avoid unwanted investigations, unnecessary hospitalization and treatment. As there is a paucity of studies on diaper area dermatoses in the current literature, a clinical study can unravel the common clinical manifestations in our population.

METHODS

The study was undertaken from March 2014 to July 2015. All children below 5 years of age with eruptions involving the diaper area reporting to the Department Of Dermatology, Sri R. L. Jalappa Hospital and Research centre attached to Sri Devaraj Urs Medical College, Kolar were enrolled in the study. A written consent was taken from the informant. A detailed history including chief complaints, recent infections, history of allergy, family history of rash like conditions, general physical examination and dermatological examination was done and recorded in a proforma. Tests such as Tzanck smear, skin biopsy, KOH preparation, culture sensitivity, Gram staining and appropriate hematological investigations were done whenever necessary depending on the presenting condition. Children below 5 years with eruptions involving diaper area were included in the study. Patients who had taken treatment earlier were excluded from the study.

Data was compiled in Microsoft excel after coding and was analyzed using SPSS 20 version software. Qualitative data was represented by frequencies and proportions and was analyzed.

RESULTS

A total of 130 cases having lesions over the diaper area were enrolled in this clinical study.

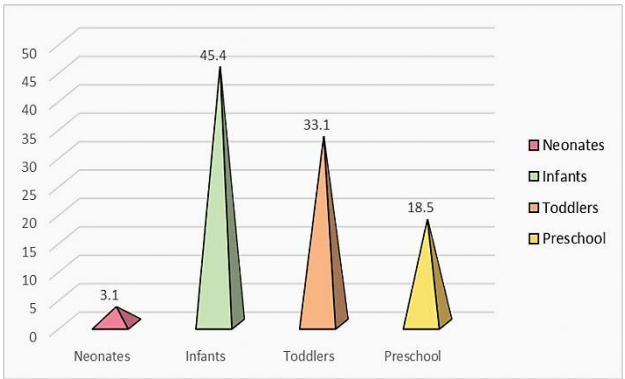

Figure 1: Diagram showing age group distribution.

In the present study on children below 5 years, majority of cases were infants (45%), followed by toddlers (33%), preschool children (19%) and least were neonates (3%) (Figure 1).

Table 1: Examination of diaper area site.

Area	Frequency	Percentage (%)
Gluteal area	85	65.4
Inner aspect of thigh	60	46.2
Lower abdomen	56	43.1
Genitalia	28	21.5
Lower lumbar region	23	17.7

Males (52.3%) were affected marginally more than females (47.7%). Majority of the patients (93.1%) presented with symptoms of less than 6 weeks duration. 37.7% of the cases developed initial lesions over the diaper area and 31.5% of children developed lesions confined to the diaper area alone. The most common diaper area involved was gluteal region (65.4%) followed by inner aspect of thigh (46.2%), lower abdomen (43.1%), genitalia (21.5%) and lower lumbar region (17.7%) (Table 1). Papule (37.7%) and excoriation (32.3%) were the commonest morphological presentation in our study.

Table 2: Clinical types of diaper dermatoses in the study.

S. no	Condition	Frequency	%
1	Irritant contact dermatitis	29	22.3
2	Scabies	19	14.6
3	Impetigo	18	13.8
4	Papular urticaria	15	11.5
5	Varicella	9	6.9
6	Miliaria	8	6.2
7	Seborrhoeic dermatitis	5	3.8
8	Candidiasis	4	3.1
9	Hand foot and mouth disease	3	2.3
10	Acute urticaria	2	1.5
11	Erythema multiforme	2	1.5
12	Gianotti crosti syndrome	2	1.5
13	Hemangioma	2	1.5
14	Lamellar icthyosis	2	1.5
15	Lichen striatus	2	1.5
16	Vitiligo	1	0.8
17	Tuberous sclerosis (Shagreen patch, ash leaf macule)	1	0.8
18	Staphylococcal scalded skin syndrome	1	0.8
19	Stevens-Johnson syndrome	1	0.8
20	Subcutaneous fat necrosis	1	0.8
21	Nevus depigmentosus	1	0.8
22	Lipoatrophy	1	0.8
23	Acrodermatitis enteropathica	1	0.8
	Total	130	100.0

A total of 23 various dermatoses were encountered (Table 2). ICD (22.3%) was the most common dermatoses, followed by scabies (14.6%), impetigo (13.8%), papular urticaria (11.5%).

Irritant contact dermatitis and impetigo were common in infants. Scabies was common in toddlers and papular urticaria was common in preschool children.

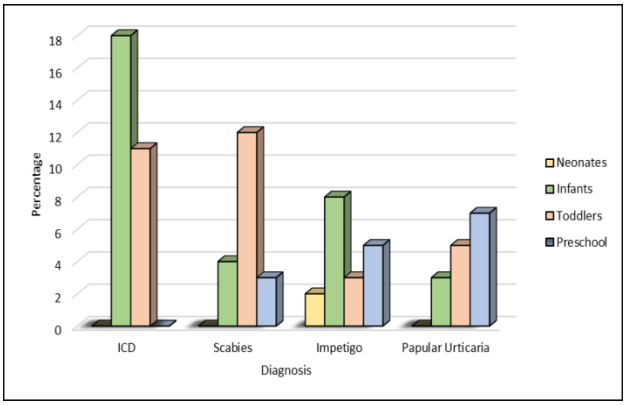

Figure 2: Bar diagram showing association between clinical dermatoses and age group.

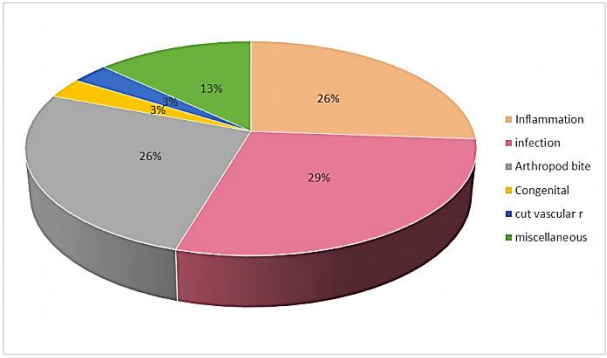

Figure 3: Pie diagram showing aetiology of diaper area dermatoses.

The most common aetiological factor was infection (28.46%) followed by inflammation and arthropod bite (Figure 3). Infectious aetiology was the commonest, seen in 37 (28.46%) children. Bacterial infection (14.61%) was most common followed by viral (10.76%) and fungal infection (3.1%). Out of bacterial infection, impetigo was the commonest entity seen in 19 (14.61%) children followed by SSSS seen in 1 (0.8%) patient and in impetigo, *Staphylococcus aureus* was the causative organism in 15 cases and Group A beta hemolytic streptococcus, in 3 cases. Out of various viral infections, varicella was seen in majority 9(6.9%) of the cases and multinucleate giant cells were seen on Tzanck smear. Hand foot mouth disease and gianotti crosti syndrome were seen in 3 (2.3%) and 2(1.5%) patients respectively. Among fungal infections candidiasis was seen in 4 (3.1%) patients and KOH and fungal culture was positive for *Candida albicans*.

Figure 4: Impetigo involving gluteal region.

Figure 5: Candidiasis with satellite pustules.

Figure 6: Irritant contact dermatitis.

Inflammatory aetiology was seen in 34 (26.15%) patients. ICD (29, 22.3%) secondary to diapers was seen in 24 patients and 3 cases was secondary to diarrhea. Seborrhoeic dermatitis was seen in 5 (3.8%) patients.

Figure 7: Scabies involving genital area.

Figure 8: Ulcerated infantile hemangioma.

Among arthropod bites scabies was seen in 19 (14.6%), and papular urticaria was seen in 15 (11.5%) patients.

Congenital dermatoses were seen in 4(3.07%) patients. Autosomal recessive lamellar icthyosis was seen in 2(1.5%) patients. Nevus depigmentosus and tuberous sclerosis (ash leaf macule and shagreen patch) in the diaper area was seen in 1 (0.8%) patient each.

Erythema multiforme secondary to HSV infection was seen in 2 (1.5%) patients. Acute urticaria involving diaper area was seen in 2 (1.5%) patients.

Among the miscellaneous conditions, miliaria was seen in 8 (6.2%) patients. Vascular malformation, hemangioma was seen in 2 (1.5%) patients. SJS due to phenobarbitone was seen in 1 (0.8%) patient. Sub-cutaneous fat necrosis secondary to fetal hypoxia was seen in 1 (0.8%) patient. Lichen striatus was seen in 2 (1.5%) patients. Lipoatrophy secondary to trauma was seen in 1 (0.8%) patient. Acrodermatitis enteropathica due to zinc deficiency was seen in l (0.8%) patient.

DISCUSSION

Dermatoses in diaper area are very common in general practice. They occur as primary diseases of the diaper area, as part of a generalised inflammatory skin disease, or as part of a systemic disease.

There are no comprehensive studies on the various clinical patterns of diaper area dermatoses in the Indian and Western literature. Hence, clinical and aetiological studies are required to assist in the selection of appropriate treatment and the prevention of important complications of diaper area dermatoses.

In our study, a total of 130 children below 5 years with lesions over diaper area were enrolled. Detailed history was taken; clinical examination was done along with appropriate investigations. Predisposing factors, preexisting co-morbidities and other associated conditions were enquired and noted.

A total of twenty three various dermatoses were recorded in one hundred and thirty children below five years of age.

A total of 62 females (47.7%) and 68 males (52.3%) were affected, indicating slight male preponderance which is in concordance with the study on the pattern of paediatric dermatoses by Balai et al.[5]

In the present study, majority of cases were infants (45%), followed by toddlers (33%), preschool children (19%) and least were neonates (3%). Whereas in a study by Banerjee et al, toddlers (42%) outnumbered infants and preschool children.[6]

The most common diaper area involved was gluteal region (65.4%), followed by inner aspect of thigh (46.2%), lower abdomen (43.1%), genitalia (21.5%) and lower lumbar region (17.7%).

Among the various etiologies encountered, infections (28.46%) were most common followed by inflammation (26.15%) and arthropod bite (26.15%), which is similar to studies by Balai et al and Banerjee et al.[5,6]

Of the infective dermatoses, bacterial infection (14.61%) was most common followed by viral (10.76%) and fungal infection (3.1%). Whereas bacterial infection was followed by fungal and viral infection in study by Balai et al.[5] Fungal infections were reported to be more common in study by Sayal, while viral infections outnumbered bacterial and fungal infection in another study.[7,8]

In the present study, impetigo (13.8%) was the commonest bacterial infection like many other studies.[5,9]

Gluteal area was the commonest region of involvement followed by lower abdomen. Impetigo was more prevalent among infants, followed by preschool children and toddlers. Whereas impetigo occurred much less commonly in infants compared to other age groups in study by Banerjee et al.[6]

Candidiasis (3.1%) was the most common fungal infection, which is consistent with other study.[10]

Out of various viral infections, varicella was seen in majority (6.9%) of the cases in our study whereas, herpes simplex was the commonest viral infection in another study.[3]

Pattern of inflammatory disorders revealed ICD (22.3%) to be the commonest, followed by seborrhoeic dermatitis (3.8%). Commonest region of diaper area involved was gluteal area followed by inner aspect of thigh and was more prevalent among infants. Seborrhoeic dermatitis was seen in 3 males (60%) and 2 females (40%). Similar findings was documented by Hayden and his team.[11] whereas infantile seborrhoeic dermatitis (10.49%) was most common in study by Sardana et al.[12]

Among arthropod bites scabies was seen in 19 (14.6%), and papular urticaria was seen in 15 (11.5%) children.

The incidence of scabies in our study was 14.6%. Commonly involving genitalia followed by lower abdomen and gluteal area. Scabies was more prevalent among toddlers, followed by infants and preschool children. Similar occurrence (10.61%) has been reported in few studies.[5,11] Whereas no significant age difference was found in other study.[6]

The incidence of papular urticaria in our study was 11.5% and the commonest region of diaper area involved was gluteal area followed by lower abdomen and lower lumbar region. Papular urticaria was more prevalent among preschool children, followed by toddlers and infants. Papular urticaria was more frequent in rainy season, which can be attributed to the biting habits of the insects. Similar findings were documented in various other studies.[6,13]

CONCLUSION

Our study emphasizes various dermatoses in diaper area in paediatric population. The three common disorders were irritant contact dermatitis, scabies and impetigo.

This study highlights the fact that many of the common dermatoses can significantly involve the diaper area and can have overlapping symptoms and presentations making the diagnosis difficult. This study also proves that aetiology is multifactorial and is not because of diaper alone. Awareness of these conditions over diaper area and attention to a comprehensive cutaneous examination will help the clinician to arrive at an accurate diagnosis.

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Ethical approval: The study was approved by the institutional ethics committee

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