

**CLINICO-EPIDEMIOLOGICAL STUDY OF VESICULOBULLOUS DISORDERS IN  
PEDIATRIC AGE GROUP IN SOUTH-EAST RAJASTHAN**

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**ABSTRACT**

**Objective:** A study to determine the prevalence and clinical characteristics of different vesiculobullous disorders in pediatric (0-18 years) age group, in a tertiary care centre in South-East Rajasthan. **Materials and Methods:** All children  $\leq 18$  year, with vesiculobullous disorders, attended the outpatient department of pediatric dermatology clinic at our institution over a period of 1 year from July 2017 to June 2018 were included in this study. **Results:** A total of 197 out of total 20982 children in age group of 0 to 18 years attending our outpatient Department, presenting with vesiculobullous disorders during the study period, so prevalence of vesiculobullous disorders among them was 0.94%. There were 121(61.42%) male and 76(38.58%) female with male to female ratio of 1.6:1. The mean age was 4.91 years. Children in the age group of  $>5-11$  years showed maximum incidence (49/197) of the vesiculobullous disorders, infections and infestations being the most common vesiculobullous disorders seen in 140(71.06%) children, followed by inflammatory disorders seen in 20(10.15%), miscellaneous disorders in 18(9.14%), non-infectious disorders in 7(3.55%), autoimmune disorders in 6(3.04%) and drug reactions in 3(1.53%). Metabolic and inherited disorders seen in 2(1.02%) children and 1(0.51%) child respectively. **Conclusion:** The present study concludes that clinical observations remain the key toward the diagnosis and lab investigations can not provide any shortcut to the diagnosis. vesiculobullous disorders in children are often misdiagnosed causing false incidence reports. Our knowledge in this field need to be upgraded in the years to come.

**KEYWORDS:** Vesiculobullous, Pediatric age group, Infections, Inflammatory disorders.

**INTRODUCTION**

The field of pediatric dermatology has gained significant recognition in the past several years.<sup>[1]</sup> Skin diseases in childhood are common and may constitute at least 30% of all outpatient visits to pediatricians and 30% of all visits to a dermatologist involve children.<sup>[2]</sup> Vesiculobullous disorders are common in children. Primary vesiculobullous disorders include vesicles, bullae and pustules. It can either be very benign or potentially fatal in some cases. They can be either inherited or acquired depending on the etiology.<sup>[1]</sup> Only limited information is available about frequency of specific skin diseases in children and due to the rare incidence of each of these diseases in children, most of the cases have been reported as case reports and there are only a few studies in Indian literature regarding the pattern of vesiculobullous diseases exclusively in pediatric age group.

**MATERIAL AND METHODS**

It was a hospital based observational descriptive study. All paediatric patients 18 years and below with vesiculobullous disorders attended the outpatient department between July 2017 to June 2018 were enrolled in the study.

A detailed clinical history and examination was done in all children and data was collected on a predesigned proforma and information included name, age, gender, diagnosis, age at onset, duration of disease, associated cutaneous and systemic conditions. Investigations like gram stain, tzanck smear, KOH examination, skin biopsy and immunofluorescence were done when required for confirmation of diagnosis.

## RESULTS

In our study, a total of 197 children upto 18 years of age with Vesiculobullous disorders, were evaluated. Out of total 20982 patients in age group of 0 to 18 years attended our OPD, the number of patients from 0 to 18 years with vesiculobullous disorders were 197, so prevalence of vesiculobullous disorders among them was 0.94%. In our study out of 197 patients, 121(61.42%) children were male and 76(38.58%) children were female with male to female ratio of 1.6:1. A pattern of seasonal variation was seen in 5 common dermatoses. Patients with HFMD, impetigo and dermatophytic infections were recorded mainly in rainy and summer seasons, while scabies was mostly seen in winter and rainy seasons. Papular urticaria presented predominantly in rainy season. The children were placed into 6 sub groups. Among 197 patients enrolled in the study, most of the children belonged to age group of 5-11 years were 49(24.87%) and least number of the children belonged to age group of birth to 1 month were 8(4.06%). The neonates constituted 8(4.06%) of study population. There were 3(1.52%) boys and 5(2.54%) girls in neonate's group. 1 month to 1 year age group constituted 47(23.86%) children with 26(13.20%) boys and 21(10.66%) girls. Pre-school group (>1 to 5 years) was the largest group with 73(37.05%) children constituting 50(25.38%) boys and 23(11.67%) girls. There were 28(14.21%) boys and 21(10.66%) girls in school going age group of >5 to 11 years. There were 20(10.15%) children in age group of >11 to 18 with 14(7.11%) boys and 6(3.04%) girls. Out of 197 patients, 127(64.47%) children belonged to urban background while 70(35.53%) children were from rural background, with the ratio of 1.8:1. The various vesiculobullous disorders were categorized into eight groups. The most common group was infections and infestations seen in 140(71.06%) children followed by inflammatory disorders seen in 20(10.15%) and miscellaneous disorders constituted of 18(9.14%) children. Non-infectious disorders constituted of 7(3.55%) children. Autoimmune disorders were seen in 6(3.04%) children. Drug reactions seen in 3(1.53%) children. The least common disorders seen in the present study belonged to metabolic disorders seen in 2(1.02%) children and inherited disorder seen in 1(0.51%) child. Majority of infectious disorders belonged to viral infections seen in 86(43.65%) children followed by bacterial infections seen in 39(19.80%), fungal infections seen in 8(4.06%) children and infestations seen in 7(3.55%) children. Of the viral infection group, HFMD was the most common entity seen in 39(19.79%) followed by Varicella seen in 24(12.18%) and HZ seen in 11(5.58%) children, Herpes labialis seen in 5(2.54%), Herpes simplex in 4(2.03%), Eczema herpeticum in 2(1.02%) and Herpes genitalis seen in 1(0.51%) children. Out of bacterial infections, bullous impetigo was the commonest seen in 36(18.28%) followed by SSSS seen in 3(1.52%) children. Out of fungal infections, candidiasis was seen in 5(2.54%) children followed by bullous tinea pedis seen in 2(1.01%) and tinea manuum seen in 1(0.51%) children.

In our study, out of 197 children, infestations in the form of bullous scabies seen in 7(3.55%) children. In group of non-infectious disorders, erythema toxicum neonatorum seen in 4(2.02%) and miliaria seen in 3(1.52%) children.

Of inherited disorders group only 1(0.51%) case of epidermolysis bullosa dystrophica(EBD) seen in our study (Figure 1a). Out of Metabolic disorders only 2(1.02%) children were seen with acrodermatitis enteropathica. Pattern of inflammatory disorders revealed pompholyx to be the commonest seen in 15(7.61%) children followed by bullous popular urticaria seen in 4(2.03%) and bullous lichen planus seen in 1(0.51%) children. Out of the 3(1.53%) children with drug reactions, stevens-johnson syndrome (Figure 1b) and bullous fixed drug eruption (Figure 1c) were seen in 2(1.02%) and 1(0.51%) children respectively. Autoimmune disorders were recorded in 6(3.04%) patients, of which pemphigus vulgaris (Figure 1d) was the commonest seen in 3(1.52%) followed by chronic bullous disease of childhood (Figure 2a) seen in 2(1.02%) and bullous pemphigoid seen in 1(0.51%) children. Out of miscellaneous disorders, paederus dermatitis (Figure 2b) was the commonest seen in 8(4.06%) children followed by friction blister seen in 7(3.55%) and burn seen in 2(1.02%) children while allergic contact dermatitis seen only in 1(0.51%).

## DISCUSSION

Vesiculobullous disorders in children form a challenging domain for treating clinicians due to its varied presentation. The pattern of blistering disorders varies in different age groups. The etiopathogenesis of bullous disorders in children differs as compared to adults. It is categorized into inherited disorders, infectious, inflammatory, autoimmune, drug reactions and metabolic disorders.<sup>[3]</sup>

Maximum number of children in the present study belonged to school age group i.e. 49(24.87%) it can be due to the difference in exposure rates, outdoor activities and lack of awareness in this age group. Many studies have shown that skin disorders are more commonly seen in this age group.<sup>[4,5]</sup> Minimum number i.e. 8(4.06%) children belonged to age group of birth to 1 month.

In our study, male 121(61.42%) patients out numbered female 76(38.58%) patients with male to female ratio of 1.6:1, which is not significantly different from studies done by Srinivas SM et al<sup>[6]</sup> and Gupta V.<sup>[7]</sup> Several other studies on the pattern of skin diseases in children worldwide also reported a slight male predisposition.<sup>[5,8,9]</sup> Male preponderance due to the difference in their pattern of clothing, outdoor activities and contact with other children can be the reason. Male out numbered females in age group of 1-3 years (35/11) and 11-18 years (14/6), while female were more commonly affected in the neonatal age group (5/3). Children from urban background 127(64.47%) out numbered rural 70(35.53%) children with the ratio of 1.8:1, which was

consistent with result of study done by Balai M et al.<sup>[10]</sup> Ours being a tertiary health center this was expected due to relatively easy access and also more health awareness among urban subpopulation. It also indicates that because of easy availability of medical facility and more awareness to health in urban area, people living in urban area report earlier than those in rural areas. Pattern of some of the disorders is affected by seasonal and climatic factors. Patients with HFMD, impetigo and dermatophytic infections were recorded mainly in summer season. Scabies was seen in winter season and papular urticaria presented mainly in rainy season. A study by Banerjee et al show similar observation.<sup>[11]</sup> In this study, majority of disorders belonged to infections and infestations seen in 140(71.06%) followed by inflammatory disorders seen in 20(10.15%) and miscellaneous disorders seen in 18(9.14%) children. Similar to our study, Sardana et al found infections as most common entity.<sup>[5]</sup> In the present study the most common vesiculobullous disorders were infections as seen in other studies. Infections are the most common pattern documented in various studies ranging from 35.6 to 85.2%.<sup>[12]</sup> Among infections, viral infections were most common seen in 86(43.65%) children followed by bacterial infections seen in 39(19.80%) and fungal infections seen in 8(4.06%). Viral infections outnumbered bacterial and fungal infections in a study by Wenk et al<sup>[13]</sup> and Gul et al.<sup>[14]</sup> The variation among infective disorders can possibly be attributed to the region of study, prevalent environmental factors, type of population studied, hygiene, nutritional status etc.

HFMD, bullous impetigo and varicella accounted 39(19.79%), 36(18.28%) and 24(12.18%) respectively of the total infections. Studies have shown HFMD to occur more in children less than 5 years as seen in our study.<sup>[15,16,17]</sup> HZ seen in 11(5.58%) children in our study. In our study, Varicella was most common in the age group of 5-11 years. As reported by Meyer et al., 90% of the cases occur in children <10 years of age and few cases occur in older individuals.<sup>[18]</sup>

In our study, bullous impetigo was the commonest bacterial infection seen in 36(18.28%) children followed by SSSS (Figure 2c) seen in 3(1.52%). Impetigo was most common in preschool and school age group, was supported by other studies.<sup>[19,20,21]</sup> Brown et al. and Sladden and Johnston, described impetigo as the most common bacterial skin infection.<sup>[22,23]</sup> Several other authors have also shared the same view.<sup>[24,25,26,27]</sup>

All cases of impetigo presented with only skin involvement, with face being the most common site followed by extremities. This view is shared by other authors.<sup>[28,29]</sup>

In our study, candidiasis (Figure 2d) was the most common fungal infection seen in 5(2.54%) children followed by bullous tinea pedis seen in 2(1.01%) and tinea manuum seen in 1(0.51%). In a study by Sharma et

al, candidal intertrigo was the most common fungal infection with maximum incidence in infants.<sup>[30]</sup> Infestations constituted only of 7(3.55%) cases of the total cases in the form of bullous scabies. All other studies reported scabies to be one of the commonest dermatosis in children. This difference is because vesiculobullous presentation of scabies is not common.

In the present study, the second most common vesiculobullous disorder was inflammatory disorders. Among the inflammatory disorders, pompholyx constituted of 15(7.61%) cases of the total disorders. Srinivas S M et al. in their study have reported 12.2% of the children to have pompholyx.<sup>[6]</sup> Bullous papular urticaria seen in 4(2.03%) and bullous lichen planus seen in 1(0.51%) of total children. Various studies have reported the prevalence of insect bite reactions varying from 5.1 to 10.6%.<sup>[31,32]</sup> Kar et al. in his study found only 5% of insect bite reactions to have vesicles and bullae.<sup>[33]</sup> Sayal et al noticed more frequent occurrence of papular urticaria.<sup>[4]</sup>

In the present study, non-infectious vesiculobullous disorders were seen in 7(3.55%) children. Among them erythema toxicum neonatorum seen in 4(2.03%) children and miliaria crystallina seen in 3(1.52%).

In our study, Epidermolysis bullosa dystrophica was the only inherited disorder seen in only 1(0.51%) case. Worldwide data suggests that there is no gender, racial or geographical predilection of EB. According to the National EB registry project from USA, the incidence and prevalence rates of EB simplex are 10.75 and 4.65, of junctional EB are 2.04 and 0.44, and dystrophic EB dominant type 2.86 and 0.99 and recessive dystrophic EB 2.04 and 0.92, respectively.<sup>[34,35]</sup>

In the present study, acrodermatitis enteropathica was the only metabolic disorder seen in 2(1.02%) children. A higher incidence (3.6%) of acrodermatitis enteropathica has also been reported in a study from Karachi by Javed et al.<sup>[36]</sup> In the present study, autoimmune blistering disorders were seen in 6(3.04%) children. Among them 3(1.52%) children had PV, 2(1.02%) had CBDC and 1(0.51%) had BP. Only 3(1.52%) cases of PV were reported in the present study, 1(0.51%) in male and 2(1.02%) in females. The cases were reported only in the age group of 5-11 years and 11-18 years. The similar data was reported by Bjarnason and Flosadottir<sup>[37]</sup> who described the mean age of onset of childhood pemphigus as 12 years, and also reported M: F ratio of 1:0.96, while it was reported as 1:1.26 in a study by David et al,<sup>[38]</sup> Jordon et al. called childhood pemphigus as a rare disease that comprises only a minority of the immune-bullous diseases seen in children.<sup>[39]</sup>

The presentation of PV was quite similar to that seen in adults, and the same has been reported by Merchant and Weinstein.<sup>[40]</sup> Patient with CBDC showed predominant skin involvement, with mucosal involvement.

Involvement of mucosa in CBDC have already been reported in earlier studies.<sup>[41,42]</sup> Drug reactions constituted of 3(1.53%) of the total disorders. Among drug reactions, SJS seen in 2(1.02%) children and bullous FDE seen in 1(0.51%) case, which might be due to the limitation of giving drugs to children by the parents.

Among the miscellaneous disorders, paederus dermatitis seen in 8(4.06%) children and frictional blisters seen in 7(3.55%) children, while burn in 2(1.02%) and allergic contact dermatitis seen in 1(0.51%). The diseases such as incontinentia pigmentii, bullous ichthyosiform erythroderma, bullous SLE, bullous Henoch-Schonlein purpura and congenital syphilis, often reported in the literature to give rise to vesiculobullous lesions, were not encountered in the present study, which might be due to rarity of the disease.

There have been extensive research and rapid developments in the field of pediatric dermatology in the last few decades. Although there are various published studies on pediatric dermatology, but no studies have been attempted describing exclusively, the profile of vesiculobullous diseases in children as a whole under one roof.

The present study concludes that clinical observations remain the key toward the diagnosis and lab investigations can not provide any shortcut to the diagnosis. Bullous disorders in childhood are often misdiagnosed and hence causing false incidence reports. Our knowledge in this field need to be upgraded in the years to come.

#### Source of support

Nil.

#### Conflict of interest

Nil.

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