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STUDY OF FEVER WITH RASH IN PEDIATRIC POPULATION ATTENDING TERTIARY CARE CENTER IN EAST PART OF CENTRAL GUJARAT

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Abstract

Introduction: *Fever and skin rash is a common paediatric complaint which makes the child irritable & leads anxious parents rush to the emergency. Inability to express complaints by patient and varied presentation of common ailments make it difficult for general practitioners to diagnose aetiology of febrile rashes. Thus pediatric dermatology has now been new area of interest for dermatologists and pediatricians.* ***Aims & objectives:*** *To study epidemiological data of febrile skin diseases in pediatric population. To study pattern of association of fever with skin rashes.* ***Material and method:*** *A prospective study was conducted in dermatology department of tertiary care centre from June 2017 to May 2019. All paediatric patients with fever and skin rashes were included. Demographic data, history of development of fever, type of fever, duration between fever & development of rash, morphology & distribution of rash was noted.* ***Results:*** *Among 243 patients, 145 were male and 98 were female. Highest incidence was noted in 0-7 year agegroup. Maximum patients belonged to lower lower(37%) socioeconomic class. Similar complaint in siblings was seen in 35% of patients having infectious disease. Maximum patients were of viral exanthema in infectious and allergic reactions in non infectious diseases. Most common system involved was reticuloendothelial followed by respiratory system.* ***Conclusion:*** *Proper knowledge of epidemiological trends of regional diseases, association between fever & development of rash and alarming signs of systemic deterioration can help in early diagnosis and intervention hence better outcome.*

Keywords: *Pediatric, fever, rash*

INTRODUCTION

Fever and skin rash is a common paediatric complaint which makes the child irritable & leads anxious parents rush to the emergency. Inability to express complaints by patient and varied presentation of common ailments make it difficult for general practitioners to diagnose aetiology of febrile rashes adding severity to the disease by delaying the diagnosis and sometimes worsening the situation by prior misdiagnosis. Although in most cases presenting with febrile rash, the disease is benign, in some it may be the first & sole manifestation of serious life-threatening condition. For the dermatologist & paediatrician, it is worth to know the recent epidemiological trends of pattern of fever & development

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of rash for the diagnosis of febrile rash in early phase to prevent morbidity & mortality of the child as well as psychological stress to the parents.

Fever is not a disease but a sign that body's immune system is fighting against some antigen.Itcan be continuous, intermittent or remittent. Skin rash is a symptom which appears during the course of a systemic or localized disease that could be characteristic diagnostic finding in a small set of specific diseases or could be nonspecific and play only supportive role in diagnosis.Itcan be maculopapular, vesicular, pustular, petechial, and purpuric.

Temporal association between pattern of fever & development of rash can give direction and knowledge of epidemiological trends and help to make diagnosis early, preventing unnecessary lab investigations. Keeping the importance of early management of pediatric febrile rashes in mind, it has now been a new area of interest for both dermatologists and pediatricians.

COMMON CAUSES OF FEVER WITH RASH IN CHILDREN:

VIRAL	BACTERIAL	COLLAGEN VASCULAR DISAESE	DRUG HYPERSENSITIVITY
•measles •rubella •varicella •HSV virus •dengue •HHV6 •HHV7 •Influenza virus	•staphylococcus aureus •group A streptococcus •neisseria meningitidis •salmonella typhi	•systemic juvenile rheumatoid arthritis •SLE •juvenile dematomyositis •kawasaki disease •HSP	•SJS •TEN •DRESS •AGEP •leucocytoclastic vasculitis

AIMS & OBJECTIVES

- To study epidemiological data of febrile skin diseases in pediatric population.
- To study pattern of association of fever with skin rashes.

METHODOLOGY

Study pattern: Prospective study in dermatology department of a tertiary care center in eastern part of central Gujarat.
Study period: 24 months i.e. from June 2017 to May 2019.
Inclusion criteria:

- Patients age ≤15 year presenting to dermatology / pediatric department with fever and skin rashes.
- Patient's parents/ guardian giving consent for photograph and use of data in future studies

Exclusion criteria:

- Parents / guardians who had denied for consent of photograph & enrolment in future studies.
- Patient age > 15 years.

All paediatric patients presenting to dermatology / paediatric department with fever and skin rashes were included after parent/ guardian's written consent for photograph & enrolment in study. Demographic data including age, sex, address, socioeconomical class were entered in study proforma. Detailed history of development and type of fever, duration between fever and development of rash, morphology and distribution of rash was noted. H/O similar cases in family/ neighbourhood and seasonal variation were noted. Thorough clinical examination for skin and systemic involvement was done and relevant lab investigations were done. Treatment was given accordingly. Patient was observed in further follow ups. Clinical photographs were obtained keeping patient's identity confidential. The study was approved by institutional ethics committee. Statistical analysis was done by using chi square test.

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RESULTS

Total 243 patients having fever with skin rash presented to dermatology / pediatric department during the period of June 2017 to May 2019 were enrolled in the study. There were 145 males (59.7%) & 98 females (40.3%) included in the study with Male: female ratio being 1.48:1. Among 243 cases enrolled in the study, significant male predominance was noted among all the diseases except in allergic conditions where the female preponderance is seen. [Chart 1]. Maximum number of patients in this study belongs to 0-7 years followed by 8-15 years. [Chart 2] Present study shows more patients (46%) coming from urban slums whereas 22% patients were coming from urban area & 32% patients were coming from rural areas. Study patients were classified according to modified Kuppuswami classification, and the results show maximum patients belonging to lower lower (37%) and upper lower (30%) socioeconomic class. Maximum patients with infectious conditions were living in a family of >6 people. Similar complaint in siblings was seen in 35% of patients having infectious disease. [Chart 3]

The study population was classified under two major subgroups according to cause of illness into infectious conditions and noninfectious conditions. Among them 211 patients were of infectious(86%), maximum being viral exanthema(41) followed by impetigo(30), chicken pox(21), acute urticaria(20), pyoderma(20), Hand foot mouth disease(15), measles(12) and Herpes Simplex Virus infection(5) in descending order and very few cases of Staphylococcal Scalded Skin Syndrome, Toxic Shock Syndrome and scarlet fever.[Chart 4] Among noninfectious cases drug reactions were maximum(20) in number in which drug induced urticaria(12), erythema multiforme(5) fixed drug eruptions(1), 2 cases of Steven Johnson Syndrome(SJS) were enrolled. Few cases of acrodermatitis enteropathica, acrodermatitis acidemica langerhans cell histiocytosis and rheumatic fever were enrolled. [Chart 5]

History of prodromal symptoms including easy fatiguability, malaise, anorexia, irritability, flu like symptoms, redness in eyes, vague abdominal pain, sore throat was observed more in infectious conditions. Also siblings of these patients reported to have such complaints within the incubation period of disease. Seasonal variation in disease presentation was noted in our study. Maximum patients of measles and chicken pox were seen in spring. In Summer maximum cases of bacterial pyoderma and impetigo were seen and in monsoon maximum cases of viral fever, dengue rash were seen. [Chart 6]

On systemic evaluation, maximum patients (83%) had one or the other system involvement. Most common system involved was reticuloendothelial (22%) followed by respiratory (20%) & gastrointestinal systems (16%) [Chart 7]

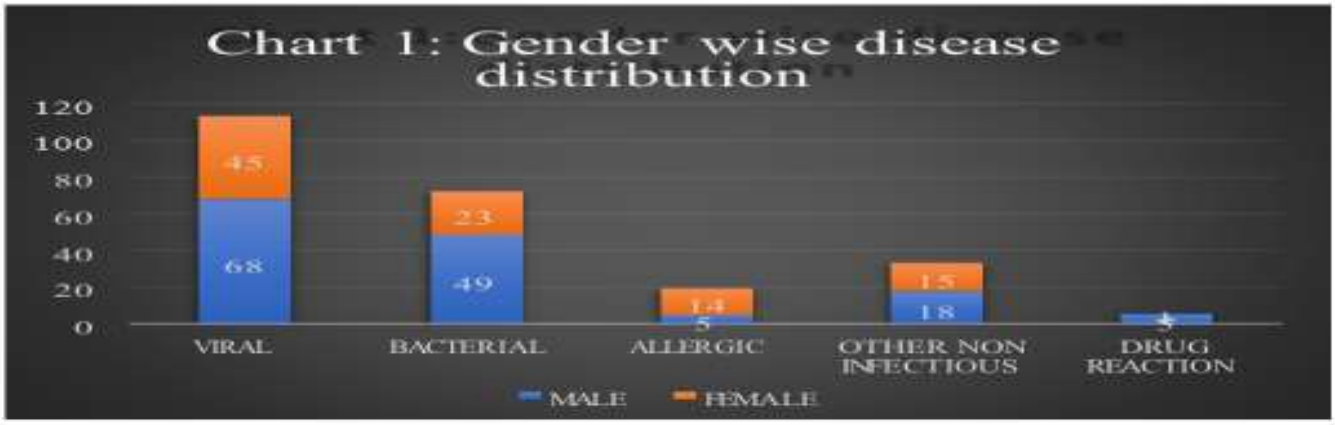

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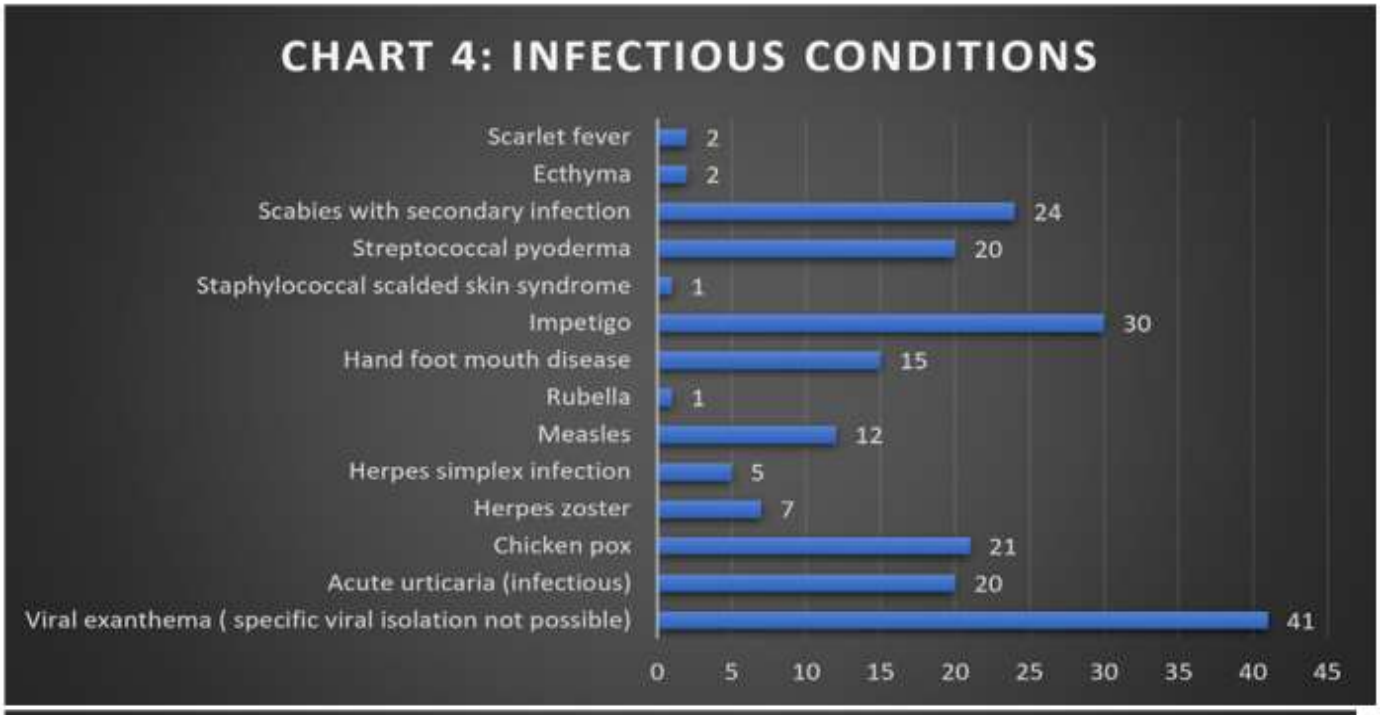
Chart 3: Family history of similar complains:

FAMILY HISTORY	YES	NO
Viral	80	44
Bacterial	45	27
Allergic	8	9
Other non-infectious	1	25
DRUG REACTION	0	8



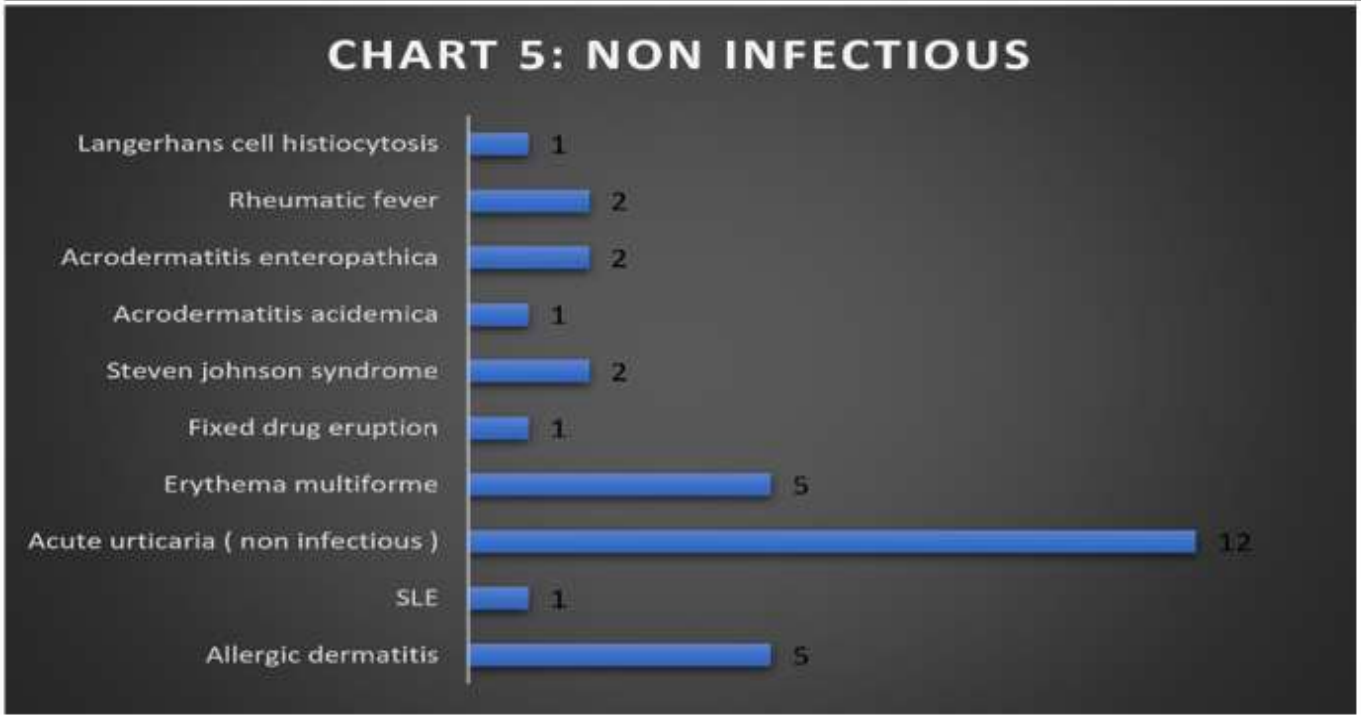


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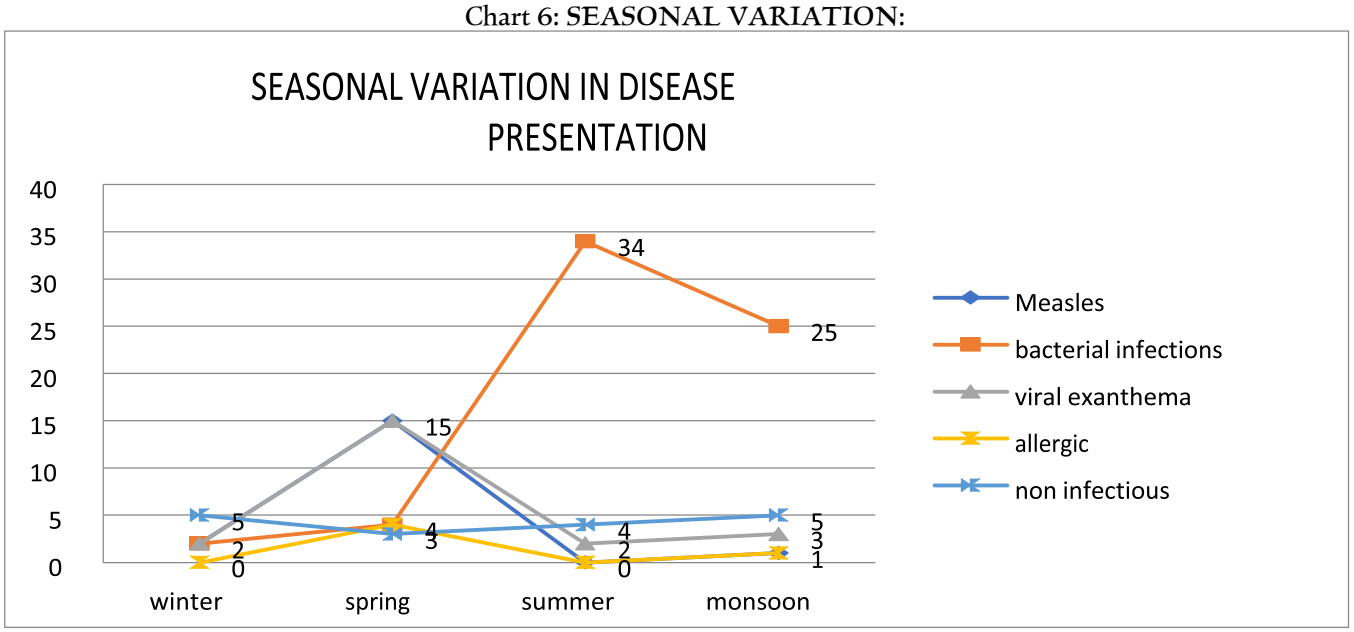
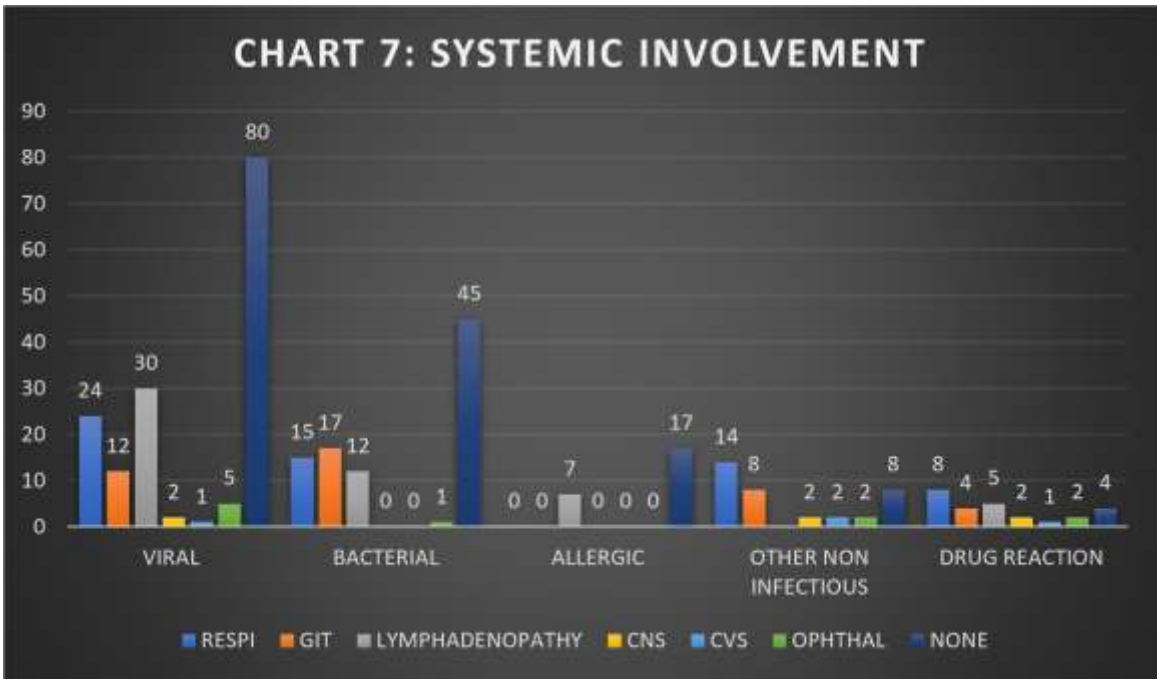
Chart 6: SEASONAL VARIATION:





DISCUSSION

Pediatric dermatology has always been a challenging field. Children are not half adults. In children skin is yet not fully developed nor is the immunity. Pediatric physiology and pattern of disease presentation andprogression are quite variable. Among them, patients presenting with febrile rash is of utmost importance because when patient with febrile illness develop rash, they tend to visit the hospital with a serious diease in mind. Also common conditions for adults can present as emergency in children. Inability to express exact symptom adds to the severity thus requiring emergency management even if situation is not that critical.

In our study male predominance was seen with male female ratio being 1.48:1. Results are statistically significant p value < 0.05. Reasons behind male predominance is high male to female ratio in general population in Gujarat (M: F=1.08:1)[9], restricted outdoor activities in female children and few reports suggesting better immunity in female child[10]. In present study most common age group affected is 0-7 years. Younger age group outnumbered the elder children in viral & bacterial infections, which is statistically significant p value <0.05. Similar results are shown in standard textbook of

pediatric dermatology[1]. Chances of getting cross infections from schools and more outdoor activities leading to more exposure to environmental antigens could be the reason for increased number of cases in this age group. Selfmedication by parents for common illnesses like upper respiratory tract infections, abdominal pain or fever, leading to drug reactions was seen maximum in this age group. Other conditions like allergies, drug reactions &non-infectious conditions are almost equally prevalent in both age groups thus showing no statistical significance

In present study, maximum patients 46% (112/243) were from urban slums statistically highly significant p value being < 0.005. As our hospital being a tertiary care center in urban city of population > 50 lakh[9] , patients from peripheral urban slums and rural areas have better access to our hospital. Again overcrowding (>6 people living in small house), poor educational level, lack of proper sanitation facilities leads to more contagious conditions in these group of patients. This relates to results of our study that maximum patients belonged to lower lower socioeconomical class.

Urticaria& angioedema (infectious + non-infectious origin) was most common (38%) entity seen in our study. Itchy wheals and swelling of lips and periorbital area, difficulty in breathing causes discomfort to the child and apparent visual severity makes the parents rush to hospital Also viral exanthem(41), chicken pox(21),HSV infection(5)& herpes zoster(7) were commonly seen pediatric conditions. Similar results are shown in standard textbook of pediatric dermatology[1].

Among noninfective causes, drug reactions were most common (22/32). Cases of drug induced urticaria angioedema were seen maximum (12), followed by EM (5), FDE (5), SJS (2) in decreasing order. Antibiotics like Fluoroquinolones, Metronidazole, anticonvulsants like phenytoin, carbamazepine, NSAIDS like ibuprofen, etoricoxib were main culprit drugs.Total burden of drug reactions was 28% of total cases. This much high number of drug reactions could be because of easy availability of OTC drugs.A large number of patients had taken medicine in raw form presenting with acute skin failure.

History of prdromal symptoms including easy fatiguability, malaise, anorexia, irritability, flu like symptoms, redness in eyes, vague abdominal pain, sore throat was observed more in infectious conditions[3]. Also siblings of these patients reported to have such complaints within the incubation period of disease. Similar case in family are seen in infective conditions as well as genetic disease like acrodermatitis acidemica. Seasonal variation of disease presenatation attributes to high pollen transmission in spring, high perspiration rate in summer and humidity in monsoon. High rate of mosquito breeding in monsoon leads to more cases of dengue in monsoon.

Patient having only skin lesions can be easily managed by dermatologist, but many a times alteration in anatomical and physiological barriers lead to multisystem involvement, requiring multidisciplinary approach. Systemic involvement was seen in 83% patients, maximum being reticuloendothelial system 22% followed by respiratory system 20% in form of upper respiratory tract infections (pharyngitis, running nose, tonsilitis) and pneumonitis and gastrointestinal system 16%. Systemic involvement was primarily involved in infective conditions whereas secondary alteration in mileu was seen with drug reactions like steven johnson syndrome

LIMITATIONS

Due to lack of sensitization of knowledge about pediatric dermatological conditions, few patients might be missed out. Further, in our set up, due to limited availability of microbiological culture & viral isolation, exact causative agent in each and every case could not be established.

CONCLUSION

As pediatric patients have different physiology & different patterns of disease presentation, it is important to have high index of suspicion while attending febrile exanthems in pediatric patients. Proper knowledge ofepidemiological trends of regional diseases, association between fever & development of rash and alarming signs of systemic deterioration can help in early diagnosis and intervention hence better outcome.

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CONFLICTS OF INTEREST: none

REFERENCES

Nelson JSB, Stone MS. Update on selected viral exanthems. CurrOpinPedtr2000; 12:359-64.

Rashmi Sarkar, Kirtisudha Mishra, Vijay Kumar Garg; Fever with rash in child in India; IJDVL, 2012, vol 78, issue 3, page 251-262

Mohammad JafarSaffar, HivaSaffar, soheilashahmohammadi;fever with rash syndrome: a review of clinical practice guidelines in differential diagnosis; Journal of Pediatrics Review, 12 july 2013.

Gindler J, Tinker S, Markowitz L, Atkinson W, Dales L, Papania MJ. Acute measles mortality in the United States, 1987-2002. J Infect Dis 2004; 189:69-77.

Fölster-Holst R, Kreth HW. Viral exanthems in childhood - infectious (direct) exanthems. Part 1: Classic exanthems. J DtschDermatol Ges2009; 7:309-16.

Manchani AJ. Exanthems in Childhood: An Update. Pediatr Ann 1998; 27:163-70

Sharma VK, Sethuraman G, Kumar B. Cutaneous adverse drug reactions: Clinical pattern and causative agents: A 6-year series from Chandigarh, India. J Postgrad Med 2001; 47:95-9.

WHO-UNICEF joint statement on strategies to reduce measles mortality worldwide. Geneva: World Health Organization. [homepage on the Internet] 2001. Available from: http://www.who.int/vaccines-documents/DocsPDF01/www667.pdf.

Indian Data Sheet 2011Census: Gujarat population gender ratio Stronger immunity in newborn girls due to genes-study, Journal pediatric research, 2014, 25th may

Indian Journal of Forensic and Community Medicine, January-March, 2019;6(1):1-3.

Modified Kuppuswamy socioeconomic scale updated for the year 2019.

The effects of weather conditions on measles incidence in Guangzhou, Southern China Journal List Hum Vaccin Immunother v.10(4); 2014 Apr PMC4896574