Evaluating the Febrile Patient with Rash in Case of Dengue, Chickunguniya and Measles in Gandhi Hospital: 2017 – 2018

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ABSTRACT

Introduction: Evaluating the patients who presents with fever and rash can be challenging because the differential diagnosis is extensive and includes minor and life threatening illnesses. Febrile rashes are classified into maculopapular rash, generalized diffuse erythema, and vesicular. Currently, viral exanthems are by far the most common cause of fever with rash in children. Study aimed to identify the patients presenting with febrile rash and to confirm cases by laboratory diagnostic methods to ensure fast, economical and speedy confirmation of the cause.

Material and methods: A survey was carried out from May 2017 to Sep 2018 by the Department of Microbiology with technical support from OP and IP staff. Blood samples were collected after informed consent. Serum samples were screened for immunoglobulin M by ELISA, test was processed according to the manufacturer's instructions.

Results: This study covered 215 subjects out of which (55.9%) were males and (43.6%) were females, cases were segregated with different age groups 0 – 5 years, 6 – 12years, 13-18 years and adults > 18 years who developed febrile rash with fever. All the samples were screened for virus specific IgM.

Conclusion: There is a need for routine surveillance program at every teaching Hospital setting to ensure the incidence of the febrile rash with illness in children among different age groups. Diagnosis can be established serologically by emphasizing the need for Clinico-serological correlation of rashes. As antibiotics will be required to treat bacterial diseases, knowing the viral etiology will help in avoiding unnecessary administration of antibiotics.

Keywords: Fever, Rash, Dengue, Chick, Measles.

INTRODUCTION

The differential diagnosis for febrile patients with a rash is extensive. Diseases that present with fever and rash are usually classified according to the morphology of the primary lesion. Febrile rashes are classified into maculopapular rash, generalized diffuse erythema, and vesicular, pustular, nodular, petechial, and purpuric rashes.[1] Currently, viral exanthems are by far the most common cause of fever with rash in children. A thorough history and a careful physical examination are essential to making a correct diagnosis.

Laboratory studies can be useful in confirming the diagnosis; test results often are not available immediately. Because the severity of these illnesses can vary from minor (roseola) to life-threatening (meningococcemia), the family physician must make prompt management decisions regarding empiric therapy. Hospitalization, isolation and antimicrobial therapy often must be considered when a patient presents with fever and a rash.

In addition, the clinical picture can vary considerably, and the family physician may need to quickly decide about initiating empiric therapy or isolation. This article reviews common diagnoses for fever and a rash and suggests a logical approach to obtaining the correct diagnosis.[2]

Spot light on Dengue, Chickunguniya, and Measles.

Dengue is the most important arthropod – borne viral infection of humans. It belongs to the Flaviviridae family. It produces a spectrum of clinical illness which ranges from asymptomatic or mild febrile illnesses, to classic dengue fever (DF), to the most severe form of illness, dengue haemorrhagic fever (DHF)[3] Classic dengue fever is marked by a rapid onset of high fever, headache,diffuse body pain (both body and muscle), weakness, vomiting, and a centrifugal maculopapular rash.

Chickunguniya fever is caused by the Chickunguniya virus, a single stranded positive sense RNA virus that belongs to the genus Alphavirus of the Togaviridae family. Chickunguniya fever is characterized by high fever with rigors, accompanied by intense joint pain, headache, myalgia, and rash. The rash is itchy, transient, maculopapular, distributed over trunk and extremities, appearing 4-8days after fever and arthritis.

In **Measles,** patients presents with discrete lesion that become confluent as rash spreads from hairline downward, sparing palms and soles; lasts >/= 3days.[4] koplik spots (enanthems) appear either 12 hour before or within 24 hour of rash appearance. Other features are cough, cold, coryza. History of lower respiratory tract infection is seen.

MATERIAL AND METHODS

A total of 215 patients with provisional diagnosis of acute febrile illness were evaluated during the period of 1st May

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S. No	Disease	Cases with fever AND rash in OP / IP	No. of positive cases
1.	Dengue	93	74(79.5)
2.	Chickunguniya	46	27(58.3)
3.	Measles	76	76(100)
Table-1: Data showing number of cases presented with rash.			

S. No	Clinical menifesation	No. of cases			% DEN	% Chick	% Measles
		DEN	Chick	Measles			
1.	Fever	93	46	76	100	100	100
2.	Rash	74	27	76	79.5	58.6	100
3.	Headache	45	21	53	48.3	45.6	69.7
4.	Arthralgia	22	46	47	23.6	100	61.8
5.	Myalgia	18	45	43	19.3	100	56.5
6.	Cough and coryza	0	0	71	0	0	93.4
7.	Diarrhea	2	5	15	2.1	10.8	19.7
Table-2: Showing correlation of clinical menifestations for confirmed cases.							

2017 To 14th Sep 2018 at Gandhi Hospital in Hyderabad. All the clinically suspected cases of febrile rash were subjected for serological study.

A detailed history was taken in identifying the cause of fever and a rash. A history of recent travel, woodland or animal exposure, drug ingestion or contact with ill persons was noted. Details about the rash including site of onset, rate and direction of spread, presence or absence of pruritus, and temporal relationship of rash and fever.[5-6]

We defined a case clinically by WHO criteria as the occurrence of a febrile rash with or without cough, coryza and conjunctivitis in the period from 1st MAY 2017 to 14th SEP 2018. Laboratory criteria employed for diagnosis was "presence of specific IgM antibodies to Dengue, Chickunguniya and Measles, "We serologically confirmed all cases as Dengue, Chickungunia and Measles by immunoglobulin M (IgM) enzyme-linked immunosorbent assay (ELISA) with following kits:

1) IgM Elisa for Dengue:
IgM ELISA kit for Dengue was procured from NIV DEN MAC ELISA Kit NIV, Pune. The sensitivity and the specificity of the test are 98.5% and 98.84% respectively.

2) IgM Elisa for Chickunguniya:
IgM ELISA kit for Chickunguniya was procured from NIV CHIK MAC ELISA Kit NIV, Pune. The sensitivity and the specificity of the test are 95% and 98% respectively.

3) IgM Elisa for Measles:
IgM ELISA kit for Measles was procured from CAL BIOTECH ELISA KIT using manufacturers' instructions. The sensitivity and specificity of the test are 100% and 98% respectively

The assays results on the samples were interpreted qualitatively as positive, negative or equivocal. Viral Infection was confirmed when anti IgM antibodies to all the 3 tests were present. In the event of an equivocal result, a second serum sample was requested to ascertain seroconversion.

We initiated active case surveillance to identify the cases that met the case definition or by stimulated passive surveillance by initiating the communication with OP and IP staff. The parent of every case patient or the next available elder

member of the family was interviewed using the semi-structured questionnaire and we explained the purpose of collecting the samples and the processing of the samples to the population studied. We took their written informed consent.

RESULTS

Most commonly affected age group in this study was 1-12 years (figure-1).

From the above Data, febrile rashes are more common in measles followed by Dengue. All the above test were confirmed by ELISA (table-1).

Clinical manifestations of patients with clinically suspected cases of acute fever with rash were diagnosed and the most common symptom was fever followed by rash (table-2).

Fever was the most common symptom seen, followed by rash, myalgia and arthralgia. Maculo-papular rashes was the
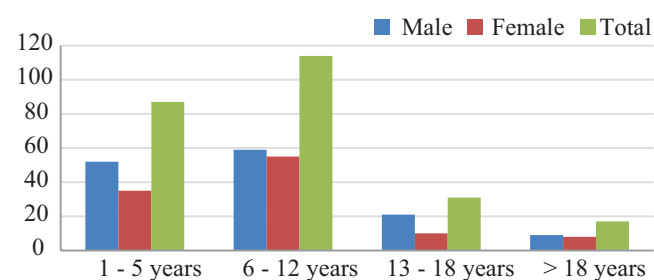

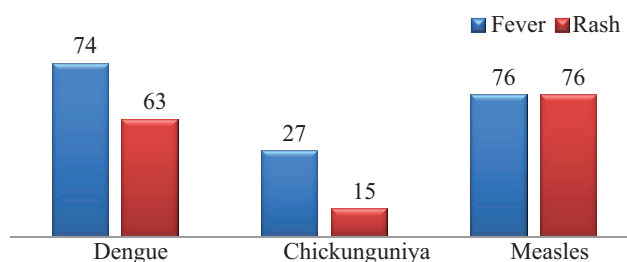**Figure-1:** Age and sex –wise distribution for all the 3 parameters.

Figure-2: Showing correlation of fever with rashes for confirmed cases.

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most common clinical sign seen in Measles cases (figure-2).

DISCUSSION

The present study was conducted in teaching hospital in Hyderabad. A total of 215 cases received at OP and IP of the pediatrics department of the hospital during the year 2017-2018. We describes the age distribution among 215 clinically suspected cases of fever with rash from whom samples were collected and confirmed as Dengue, Chickunguniya and Measles by IgM ELISA. We included only those patients in whom there was no history of drug allergies.

In our study male : female ratio is 1.2:1.with each disease and febrile rash is shown in (Char 2). The commonest age group with fever and febrile rashes was 1- 12 Years. Males were more commonly affected.

In case of **Dengue:**
This observation goes in accordance with the study done by Seema Awasthi et al who showed 58.8% of cases in 14- 44yrs age group and Prafulla Dutta et al showed 67.1% of cases.
IgM results of Dengue with rash are correlated well with the study done by Badaway A.Abdul Aziz et al[7]," Clinical and Hematological Effects of Dengue Viruses Infection". In the study by Gireesh V Achalkar et al[8] in 2013, conducted the study on 100 clinically suspected cases of Dengue. 50 patients were seropositive for dengue, 26(52%) were positive.

In case of **Chickunguniya:**
In the study done by Gianandrea Borgherini et al[9], on the Outbreak of Chickunguniya(157 adults patients) on Reunion Island, South-western part of Indian ocean, in 2007, also had male preponderance with 56.6% cases getting affected. In 2013, in Sangli District, Maharastra, showed the 54.5% of males getting affected due to Chickunguniya, with 45.5% of females being affected.
The presence of rash, in our study, correlates well with the study done by Winfried Taubitz et al[10] in 2007, South-west Islands, who conducted a study on 69 travellers, with 3-7days of fever and arthralgia of 1-30 weeks. Also in study of Galate L.B.et al[11] in 2016, Mumbai, showed 36.85% of Chickunguniya cases presenting with rash. The present study shows 57.1% of cases presenting with rash. Also in the study done by Ahmad N et al[12] during 2009 in Maharastra, showed IgM result as 96% and the study by Gianandrea Borgherini et al[9] in 157 Adult patients during 2007 showed the 75% of IgM positive cases.

In case of **Measles:**
In case of measles age group, ratio of males is more than females, similar Observation was seen in study done by Kasper S et al[13], who conducted a study on 37 patients during 2008-2009,of these 33 were confirmed serologically. In his study, he showed a female preponderance.
In our study, the most common clinical presentation seen is Rash, similar Presentation is correlates well with other studies. In the study done by Kasper S et al[13] in 2009, showed fever (92.3%), rash (92.3%). In study of Amir Mohammed et al[14] in 2011 showed fever and rash in 100% of cases. The study done by Surrender N Gupta et al[15], A mixed outbreak of Rubeola- Rubella in District Kangra of Northern India during 2013, showed the IgM positivity of 85%. Hashmi S et al[16] in their study in 2015 at Uttarakhand, showed IgM positivity of 90% cases.

CONCLUSION

There is a need for routine surveillance program at every teaching Hospital setting to ensure the incidence of the febrile rash with illness in children among different age groups.
Diagnosis can be established serologically by emphasizing the need for Clinico-serological correlation of rashes. Acute febrile illness comprises infection due to malaria, influenza, leptospirosis, scrub typhus, typhoid fever, and dengue, chickunguniya and measles of which some infections necessitate specific treatment.
As antibiotics will be required to treat bacterial diseases, knowing the viral etiology will help in avoiding unnecessary administration of antibiotics.

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