SEROLOGICAL CONFIRMATION OF MEASLES IN CHILDREN ADMITTED WITH CLINICAL DIAGNOSIS OF MEASLES.

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ABSTRACT

Objective: To determine the frequency of IgM antibodies in clinically diagnosed cases of measles.
Design: Cross-sectional, descriptive study
Place and duration: Department of Pediatrics, Saidu Group of Teaching Hospital, Saidu Sharif, Swat (from 1st Jan 2010-31 Dec 2011).
Patients and method: A total of 150 patients of measles clinically diagnosed were enrolled for the study. Detailed history, demographic profile and vaccination status were recorded. Blood samples were collected from all subjects for measles serology by observing WHO protocol.
Results: Out of 150 patients, 57% (86) were male and 43% (64) were female with mean age of 38.28±30.99 months. Out of these 150 patients, 66% (99) were positive for measles IgM antibodies, while 34% (51) were negative for measles IgM. Out of 51 measles negative patients 11.8% (6) were positive for rubella.
Conclusion: Diagnosing measles on clinical features alone is reasonable but not specific and IgM may be used to confirm the diagnosis
Key words: Measles, IgM antibodies, children, vaccination status

INTRODUCTION

Measles is a severe, vaccine-preventable viral disease that causes extensive morbidity and mortality in large parts of the world[1]. Measles continues to be a major cause of childhood morbidity and mortality worldwide, with an estimated one million fatal cases each year[2].

Measles is usually diagnosed clinically[3,4] and most of the studies in our country are based on clinical diagnosis alone[5,6,7]. Although Koplik spot is pathgnomonic and has high diagnostic power, it is present in 60 to 70% of patients at the time of presentation[3,8]. The WHO case definition of measles requires the presence of fever and rash with one or more of these symptoms: cough, coryza or conjunctivitis[4]. However, these clinical presentations can readily be confused with other rash-associated conditions, particularly those due to viruses such as roseola infantums, human herpesvirus-6 (HHV-6), rubella, dengue and parvovirus[4,9]. An antibody-capture EIA configuration for the detection of measles-specific IgM has proven more sensitive and specific (97% and 99% respectively) and reduces the chance of a false positive result due to rheumatoid factor[10]. When the clinical presentation is suspicious for measles, serologic studies and virus isolation from the blood, nasopharyngeal swabs and urine advised[11]. The laboratory confirmation of cases of measles is a vital aspect of surveillance at all stages of control programs because clinical diagnosis is unreliable[12]. The mainstay of laboratory confirmation is the detection of measles specific immunoglobulin (IgM) antibodies in serum sample[3,13].

IgM antibodies against measles virus increase with the onset of the rash and last for about one month[3,11]. This is the most useful diagnostic tool, and the result can be obtained within a few hours[10,11]. The sensitivity of IgM antibodies increases if blood is taken after seventy two hours of onset of rash[3,10]. This study is an attempt to determine the frequency of IgM antibodies in clinically diagnosed cases of measles.

Material and methods:

This cross-sectional descriptive study was conducted at Department of Pediatrics, Saidu

group of teaching hospital, Saidu Sharif, Swat, from 31st Dec 2010 to 31st Dec 2011. Clinically diagnosed patients of measles, admitted in Pediatrics unit Saidu teaching hospital were included in the study. A total of 150 patients, both male and female below age of 15 years were enrolled. Informed consent from respective parents was taken. Blood samples were collected from all the patients after 72 hours of appearance of rash according to WHO protocol[13] enrolled. Informed consent from respective parents was taken. Blood samples were collected from all the patients after 72 hours of appearance of rash according to WHO protocol[13]. Blood samples were sent to National Institute of Health (NIH) Islamabad for measles and rubella IgM antibodies and results were received through WHO focal person

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Results:

Out of 150 patients, 57% (86) were male and 43% (64) were female

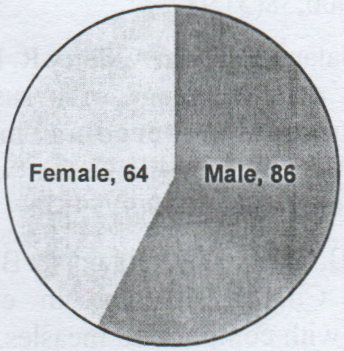


Figure 1. Sex of the patients

All patients were less than 15 years of age. The mean age of the patients was 38.28±30.99 months. Majority (84%) of the patients were below the age of five years, whereas 26% (39) were infants, and among infants 17.9% (7) were below 9 months.

Out of 150 patients, 66% (99) were positive for measles IgM antibodies, while 34% (51) were negative for measles IgM. Table 1 shows sex wise status of measles IgM.

Table 1: Sex wise measles IgM status

Results	Male (%)	Female (%)	Total (%)
Measles IgM Positive	53 (61.6)	46 (71.9)	99 (66)
Measles IgM Negative	33 (38.4)	18 (28.1)	51 (34)
Total	86	64	150

Out of 51 IgM negative, 11.8% (6) were positive for rubella IgM. No IgM for rubella were detected in IgM positive patient for measles. Proportion of Seropositivity in different age groups is shown in Fig.2

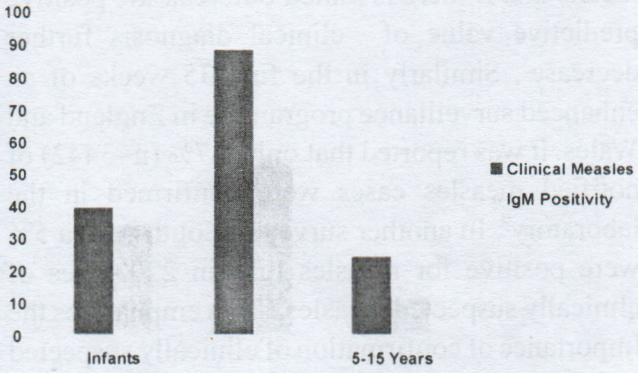


Figure 2. Proportion of seropositivity among clinically diagnosed measles in various age groups

Seven patients were below 9 months and out of them 6 (86%) were measles IgM positive. Among 32 patients of ages between 9 months to 1 year, 28 (87.5%) were seropositive. Out of 87 (58%) patients between 1-5 years, 56 (64%) were seropositive, and only 11 (46%) of 24 patients between 5 to 15 years were positive for measles IgM. All patient included in study were unvaccinated.

Discussion:

Measles IgM antibodies has been used in many studies for confirmation of measles as the gold standard[4] with sensitivity and specificity of more than 90 to 98%[10]. Using IgM in our study we noted that 34% clinically diagnosed cases were negative for IgM though we collected blood after 72 hours of rash to increase the sensitivity[3,10]. Almost similar results has also been published by Husain *et al* in 2009[14]. In their study 30.1% were

seronegative[14]. In three studies in Suburban Khartoum in 1999, 2000 and 2002, IgM seronegativity was observed in 25 to 28% of clinically diagnosed measles[2,4,15]. This means the predictive positive value of only clinical diagnosed cases is 70 to 75% in most of the studies. Helfand *et al*[16] also found 72% IgM positive cases in their study

Cohen et al[5] in there survey of suspected measles outbreak in Rawalpindi tested eleven cases of suspected measles and only 2 were positive for measles and 6 were positive for Rubella. This means that if there is mixed outbreak the positive predictive value of clinical diagnosis further decrease[5]. Similarly in the first 35 weeks of an enhanced surveillance programme in England and Wales, it was reported that only 3.7% (n=3442) of notified measles cases were confirmed in the laboratory[9]. In another survey in South Africa 5% were positive for measles IgM in 220 cases of clinically suspected measles[9]. This emphasizes the importance of confirmation of clinically suspected measles cases.

In our study we also noted that all the cases were unvaccinated which is a question mark on the vaccination coverage reported by EPI programme. We also noted that eighty threes percent of patients were below five year of age, similar percentage has been reported in other studies from Pakistan and India[6,7,17].

Conclusion:

Diagnosing measles on clinical basis is reasonable but not hundred percent reliable and need laboratory confirmation, particularly during mixed outbreaks. Immunization coverage in the district is poor.

Recommendations:

Any patient with febrile exanthm who need admission in infectious disease unit should be screened for measles. All the clinically diagnosed measles not confirmed by laboratory should receive measles vaccine. Moreover, there is a need of strengthening the EPI programme to achieve measles elimination from the country.

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