

# CLINICAL PROFILE OF MEASLES—A PROSPECTIVE STUDY OF 150 HOSPITAL BASED CHILDREN

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## ABSTRACT

*The clinical profile of 150 hospital based cases (6 months-7 yrs) of measles presenting between May 1986 to May 1987 was analyzed. Nearly a quarter (28%) were <1 yr; 60% belonged to 1-3 yrs age group, 8.6% were 3-5 yrs old and 2.6% were in the 5-7 yrs age group. The male : female ratio was 1.2 : 1. Nearly half (53.3%) were well nourished, 36.6% had Grades I-II PEM and 9.9% had Grades III-IV PEM. About half (47%) showed no complications; 53% had some complications of which 15% had more than one system involvement. Respiratory complications were seen in 50%, nutritional deterioration in 17.3%, gastrointestinal and neurological in 14.6% each and cardiac in 1.3%. The respiratory complications included pneumonia (16%), bronchitis (12.6%), activation of TB (10.66%), otitis (7.3%) and miliary tuberculosis (4%). CNS complications were encephalitis in 8%, meningitis in 3.3%, convulsions —2.6% and limb paresis in 0.6%. Children below 1 yr had a greater incidence of complications and multisystem involvement. Children between 3-5 yrs had respiratory and GI system involvement and children >5 yrs showed respiratory system involvement only. No complications were seen in the well nourished group while early grades of PEM had mild complications. Severe degree of malnutrition had higher incidence and severity of complications. The need for large coverage of measles vaccine in our country especially amongst the malnourished group is obvious.*

**Key words:** Measles, Clinical profile, Complications, Malnutrition.

Measles continues to be a disease causing severe morbidity and mortality in developing countries. The disease has more severe consequences in malnourished children(1,2). In spite of increasing awareness of measles vaccine, the disease continues to occur frequently in our country. In this manuscript, we report the clinical profile of nonimmunized cases of measles which came to public hospitals.

## Material and Methods

One hundred and fifty cases of measles aged 6 months to 7 yrs, attending the Outdoor and Indoor Departments and Municipal Hospitals in the city of Bombay during the period May, 1986 to May, 1987 were studied.

All the cases were personally checked by the authors and only those with a characteristic rash were selected. The cases with a previous immunization with measles vaccine were excluded. A detailed clinical examination was done during the acute stage. Radiological examination, at admission time and repeated after 4 weeks, was done in relevant cases. Cases with neurological signs were subjected to lumbar puncture. Children with severe complications were hospitalized, others were followed on OPD basis. In all cases blood was collected and sent to Haffekine Institute for HI antibody levels for measles. The details of our antibody studies and results are being separately reported(3).

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The following criteria were applied to determine which case should be termed as "complicated or uncomplicated".

(i) *Uncomplicated Case*: A febrile status within 4-5 days of appearance of rash; absence of any symptoms except for cough beyond 4-5 days of rash; and regaining of lost weight within 4 weeks of illness.

(ii) *Complicated case*: One or more of the following: (a) Respiratory complications—otitis media, bronchitis, pneumonia or activation of tuberculosis (with positive proof); (b) Gastrointestinal complications—diarrhea or prolapse of rectum; (c) Nutritional; (d) Cardiac and neurological.

**Results**

Of the 150 children, 42 (28%) were below 1 yr, 91 (60.6%) were aged between 1-3 yrs; 13 (8.6%) were in the age group 3-5 yrs and 4 (2.6%) were 5-7 yrs old. The youngest child was 6 months and the oldest was 7 yrs. The male to female ratio was 1.2 : 1. There were 52% Hindus, 34% Muslims; 8.8% Christians; 4.6% Parsis and 0.6% from other groups. Only one child (0.66%) died.

*Nutritional Status*

Of the 150 children, 12 (8%) were overweight; 68 (45.3%) had good nutrition; 33 (22%) had PEM Grade I, 22 (14.6%) had PEM Grade II, 8 (5.3%) had PEM Grade III and 7 (4.6%) had PEM Grade IV. Thus 53% were well nourished; 36.6% had PEM Grades I-II and 9.9% had severe PEM.

*Complications*

The highest complications were seen in the respiratory system (50%), followed by nutritional deterioration (17.3%), gastro-

intestinal 15.3% (14.6% had diarrhea and 0.7% had prolapse of rectum), neurological 14.6% and cardiac (1.3%). One case showed post measles reactive arthritis in the form of synovitis of the knee joint. This settled with rest and anti-inflammatory drugs.

Of the complications involving the respiratory system, 31.5% (16% of total) had pneumonia, 25% (12.6% of total) had bronchitis; and 14.5% (7.3% of total) had otitis media. Reactivation of TB was seen in 21% (10.6% of total) and miliary TB was documented in 7.8% (4% of total). Amongst the neurological complications, meningoencephalitis, convulsions and paresis were documented in 77.3, 18.8 and 4-5%, respectively.

The relationship of nutritional status to complications is depicted in *Table I*. It is obvious that complications increased with malnutrition and all children above Grade II malnutrition had a complicated course. The relationship of age to complications is highlighted in *Table II*. Children above 5 yrs, had only respiratory involvement, whereas children below 3 yrs showed multisystem involvement. Children between 3-5 yrs showed respiratory and nutritional complications.

**TABLE I—Relationship of Nutritional Status to Complications**

| Nutritional status | No. of cases | No (%) with complications |
|--------------------|--------------|---------------------------|
| Over-nourished     | 12           | 0 (0)                     |
| Well nourished     | 68           | 24 (35)                   |
| Malnourished       |              |                           |
| Grade I            | 33           | 23 (70)                   |
| Grade II           | 22           | 22 (100)                  |
| Grade III          | 8            | 8 (100)                   |
| Grade IV           | 7            | 7 (100)                   |

**TABLE II—Relationship of Age to Complications**

| Complications    | Per cent |         |         |        |
|------------------|----------|---------|---------|--------|
|                  | <1yr     | 1-3 yrs | 3-5 yrs | >5 yrs |
| Respiratory      | 38.0     | 43.9    | 38.4    | 25.0   |
| Gastrointestinal | 23.8     | 15.3    | —       | —      |
| Nutritional      | 19.0     | 13.2    | 7.6     | —      |
| Cardiac          | 2.3      | 1.1     | —       | —      |
| Nervous          | 33.0     | 8.7     | —       | —      |
| Multiple         | 26.1     | 19.7    | 15.3    | —      |
| Others           | —        | 1.1     | —       | —      |

## Discussion

The age distribution of the present study is in broad agreement with earlier Indian reports(4-7). However, children in 3 to 5 year age group were lower. The age distribution is in contrast to Western studies, where the affected age group is more than five years and a large number of adults are also affected(8). This is a reflection of the contrasting epidemiological profile of the disease in developing and developed countries. The sex ratio was comparable to earlier Indian studies(6,7).

A comparison of the present study and earlier Indian reports(4-10) reveals the following salient features with respect to complications encountered. The incidence of bronchopulmonary and gastrointestinal complications and nutritional deterioration was much lower in the present series. The lower incidence of complications could be related to a better nutritional status of the present series. A direct correlation was observed between nutritional profile and complications (*Table I*). Cardiac complications (1.3%) were infrequent in comparison to an earlier (2.6%) report (9). The incidence of otitis media and neurological manifestations were well within the range

reported by other(4-10). Other complications like bleeding manifestations (purpura, hemorrhagic measles) and blindness due to keratoconjunctivitis were not encountered in this and earlier Indian series in contrast to African data.

The case fatality (0.6%) was lower in comparison to earlier reports(2). A better nutritional status and improvement in hospital care with time are probable explanations for this.

Except for respiratory problems, the other complications were more frequently documented in younger children (*Table II*). The striking impact of age of CNS complications had also been noted by other workers(10-12). This is in sharp contrast to Western studies which show a higher frequency of measles encephalitis in children above 10 years of age and adults (13-15). This could be due to the fact that measles is now seen in much older age group in the Western countries due to the impact of immunization(16).

Our HI antibody titers results(3) showed, that all children above 3 years age had an excellent range of antibody titres. Children below 1 years of age had lower antibody titres. Children with a good range of antibody titres showed milder complications, whereas those with lower titres had a higher incidence and severer complications.

It is concluded that measles may pass off as a mild viral infection in well nourished children above 3 years but it can assume dangerous dimensions in children below 3 years especially if malnourished. A large coverage with measles vaccine at the optimal age is a must for our country.

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