Original Article

Measles in infants younger than 9 months of age: A descriptive analysis

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ABSTRACT

Objective: To determine the frequency of measles and measles related complications in infants younger than 9 months of age.

Methodology: A prospective observational study conducted in Department of Paediatrics Rawalpindi Medical University, Rawalpindi from January to December 2018. A pre-designed study tool was used to collect data. A total number of 298 cases of less than 9 months of age that presented to the Allied Hospitals of Rawalpindi Medical University with clinical diagnosis of measles were enrolled. The data was presented in the form of frequencies and percentages.

Results: Out of 298 cases, majority 62% (n=185) were reported from Benazir Bhutto hospital, Rawalpindi, while 36.5% (n=109) and 1.6% (n=5) cases were reported from Holy Family Hospital and District Headquarter Teaching Hospital, Rawalpindi respectively. 57.4 % of the study population was male (n=171) while 42.6 % was female (n=127). Mean age was found to be 6.62 month (SD ±2.13) with median age of 07 months. Age distribution for age groups 1-3 months, 4-6 months and 7-9 months was found to be 11% (n=33), 31.3 % (n=93), and 57.7% (n=172) respectively.

Conclusion: High numbers of infants under 9 months of age are affected by measles. Thirty per cent cases are complicated by pneumonia, gastroenteritis and otitis media.

Keywords: Measles, infants, vaccination, 9 months, Children.

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Introduction

Measles is the most transmissible infectious disease known to mankind, and is still one of the top causes of death in children worldwide.[1]Measles is normally transmitted by airborne respiratory droplets. Accelerated immunization activities have had a major impact on reducing measles deaths. Global measles deaths have decreased by 80% from an estimated 545 000 in 2000 to 110 000 in 2017.[2]

Pakistan is a country with a large (>185 million) mobile population with high birth rates and substantial spatial heterogeneity in measles vaccine coverage. [3] In the last few years, Pakistan has encountered many outbreaks/epidemics of measles. During 2018 outbreak 32,135 cases of suspected measles were reported across the country with a major case load from Punjab and Sindh, and more than 5% of these patients were reported from district Rawalpindi. In 2012-13 measles epidemic, around 26,000 cases of suspected measles with 570 deaths were reported by the WHO DEWS, during the period between January 2012 and Mid May 2013. [4]

Serious complications resulting from measles are more likely to develop in children who are immune-compromised, malnourished or under the age of five years. Pneumonitis is the principal complication accounting for most measles-associated deaths.[5]The mean case fatality ratio for measles in low and middle income countries varied according to the study setting and was 5.4% in community settings while it rose to 10.8% in hospital based studies.[6]In population with a high incidence of under nutrition and other infectious diseases, like in our country, case-fatality rate of measles is reported to be 3-6% and can reach up to 30% in complex emergencies.[7]Mortality in measles is primarily due to its complications which include gastroenteritis, meningitis, pneumonia, and encephalitis. Measles related optic neuritis can lead to blindness. The risk of mortality and morbidity due to measles is greatest in children younger than 1 year of age and those who are unvaccinated.[8]

World Health Organization (WHO) formulated the guidelines for measles vaccination in 1970 where it was recommended to give the first dose at 9 months of age in high-risk settings in the developing world. Measles Vaccine is safe, effective and inexpensive[9] and has resulted in a dramatic decrease in measles associated mortality worldwide. Studies from Bangladesh[10] and Haiti presented comparable results.[11,19]

WHO has recommended measles vaccination even before 9 months in endemic areas. To reduce measles related morbidity & mortality especially in the under 9 months age group, it is a prerequisite to determine the frequency of measles in our country affecting infants of this age. Keeping aside the failures and derelictions of routine EPI program and vaccination status of the infants, this study aims to determine the frequency of measles and measles related complications in infants younger than 9 months of age.

Methodology

A prospective observational study was carried out in Paediatric Department Rawalpindi medical university, Rawalpindi from January to December 2018. Both the in-patients and outpatient cases attended at all teaching hospitals of Rawalpindi Medical University meeting the WHO case definition of measles were included in the study using purposeful/convenience sampling.

WHO case definition for Measles was applied to any suspected case and patients fulfilling these criteria were included in this study. WHO clinical case definition of measles is "Any person in whom a clinician suspects measles infection, or any person with fever and maculopapular rash (i.e. non-vesicular) and cough, coryza (i.e. runny nose) or conjunctivitis (i.e. red eyes)". Data was collected and entered in a predesigned questionnaire by the attending paediatrician at the time of admission and was updated during the hospital stay of the patient. Data was recorded in excel sheets andanalysed using SPSS version 20 for descriptive statistics.Only cases resident of district Rawalpindi were included in this study.

Results

A total number of 998 cases of age 1 months-12 years that presented to the Allied Hospitals of Rawalpindi Medical University with clinical diagnosis of measles were enrolled in a prospective observational study. Out of 998 cases of measles, 298 (30 %) belonged to age group less than 9 months, constituting the study population for the present research. Majority of the cases 62% (n=185) were reported from Benazir Bhutto hospital, Rawalpindi, while 37% (n=109) and 1.6% (n=4) cases were reported from Holy Family Hospital and District Headquarter Teaching Hospital, Rawalpindi respectively.

57.4 % cases were males (n=171) and 42.6 % cases were females n=127. Mean age was found to be 6.62 month (SD ±2.13) with median age of 07 months. Age distribution for age groups 1-3 months, 4-6 months and 7-9 months was found to be 11% (n=33), 31.3 %(n=93), and 57.7% (n=172) respectively. Exponential growth in no of cases was observed in respect of increasing age by 5 months and above.

The study observed a very high measles incident of 30%, complicated with pneumonia 39.6%, gastroenteritis 23.5%, and otitis media 18.7%. 859 cases recovered completely while 08 cases died of pneumonia and 01 expired due to measles encephalitis.

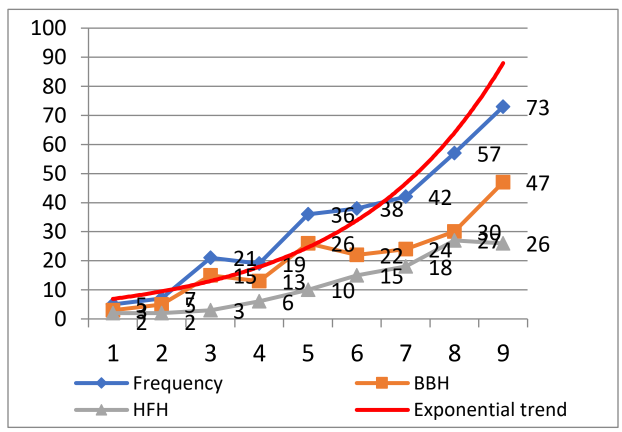

Figure 1. Age in Months of Measles Patients

Table II. Complications of Measles

	Gastroenteritis	Pneumonia	Otitis Media	Encephalitis
BBH n=185	23	66	25	1
HFH n=109	45	51	31	0
DHQ n=4	1	1	0	0
Total (298)	69 (23.15%)	118 (39.6%)	56 (18.7%)	01 (0.3%)

Discussion

Preventive measures are always better than curative actions, and immunization is the most commonly used measure for preventive health care. It reduces the hospitalization and treatment costs and has been adopted in order to avoid disease. It is also an indicator of parent's motivation to ensure a child's future welfare.

The debate of being unprotected against measles and the possible plausible reasons for being unprotected as stated in regional literature due to scarcity of measles vaccine, gender disparity, spiritual beliefs and uncertain security conditions as reported for other vaccines is out of question. WHO EPI criteria to administer the first dose of measles vaccine in Pakistan is at 09th month of life and infants younger than 9 months infected with measles are missing the chance of being vaccinated. With the endemic situations and under 9 months measles incident of 30% as per recorded by the current study some immediate actions are required to deal with the situation.

In this study, 30% of measles cases occurred in infants younger than 9 months of age. It is 10% lower than a previous study conducted in district Rawalpindi where 40% of the admitted and diagnosed patients belonged to the 6 months age group.[14] Also it is somewhat comparable to data from Bangladesh, where 31% of vaccinated and 17% of non-vaccinated infants younger than 9 months of age were affected by measles in a study documenting the incidence of this deadly disease in the under 9 months old age group.[15]

This study showed that measles was more common in males as compared to females with a male to female ratio of 1.34%. This coincides with a study conducted in Thailand which also reported that males have a higher incidence of measles as compared to females.[16]This may be due to the fact that our society is male dominant society and male patients are brought to medical attention earlier than female patients.

In current study, pneumonia and diarrhoea were the commonest complications and were present in 43.3% and 44.2% cases respectively. A study done in a tertiary care hospital in Kolkata, West Bengal similarly showed pneumonia in 30.7% and diarrhoea in around 27% as the most frequent complications.[17] Pneumonia occurred more in infants having measles with statistically significant difference. The reason for increased prevalence of pneumonia with measles is that measles virus causes a transient but profound immune suppression resulting in increased susceptibility to secondary bacterial and viral infections. Due to the development of these opportunistic infections, measles remains the leading vaccine-preventable cause of child death worldwide.[18,20.] An earlier age of vaccination is proposed to be considered in epidemic or higher endemic situations.

Conclusion

Measles occurs in a significant number of younger infants in our setup and these infants can develop severe complications like pneumonia, diarrhoea, encephalitis, corneal ulceration etc. that can lead to significant morbidity and mortality.

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