Original Article

Measles Complications in Children

Frequencies of Different Measles Complications in Children Presenting at a Tertiary Care Hospital, Larkana

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ABSTRACT

Objective: To assess the frequencies of measles complications among children presenting at Chandka Children's Hospital, Larkana.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Department of Pediatrics / Community Medicine, CMC (SMBBMU) Larkana from April 2022 to September 2022.

Materials and Methods: Patients with measles with different complications were selected from hospitalized OPD and indoor patients. A detailed history, physical examination, and different measles complications were recorded in a proforma. All selected patients' immunisation and nutritional status were evaluated. The data was analyzed using SPSS version 17 software.

Results: In the study, a total of 150 hospitalized measles-diagnosed patients were recorded; among them, 120 (80%) were selected as having measles' complications according to selection criteria. The patients in the study had a mean age of 3.95 ± 0.211 years and were mostly male 72 (60%). Among 120 patients, 70(58.3%) were vaccinated, while 50(41.7%) were unvaccinated; additionally, 36(30%) cases were found well-nourished, 59(49.2%) were mild-to-moderately malnourished, and 25(20.8%) were severely malnourished. The most common complication among measles patients in the study was pneumonia in 72(60%), followed by encephalitis 22(18.3%), acute watery diarrhoea in 21 (17.5%), and otitis media 5(4.2%).

Conclusion: The common complications of measles are pneumonia, encephalitis, watery diarrhea, and otitis media, which are mostly observed in unvaccinated and malnourished children. Good nutrition and a proper schedule can help improve health and lower the risk of disease in all age groups.

Key Words: Frequencies, Measles, Different, Complications, Tertiary, Hospital.

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INTRODUCTION

Measles is a highly infectious acute viral illness marked by high fever, cough, coryza, conjunctivitis, a pathognomonic enanthem (Koplik's spots), and a maculopapular rash. [1] In endemic regions, it is mostly a seasonal illness. Person-to-person transmission occurs mainly through airborne droplets from an infected person's coughs or sneezes, but transmission can also occur through direct interaction with contaminated fluid.[2]

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The only effective way to avoid getting measles is to get immunised. In Pakistan, the majority of children are immunised with a single dose of measles vaccine at the age of nine months, and only those who present to EPI clinics at the age of 15 months are administered the second shot. [3] In 2021, it was anticipated that 24.7 million children skipped their first dose of the measles vaccination and that 14.7 million children missed second dose.[4] Measles, 10,399 cases were recorded in Pakistan in 2021 compared to 2,747 cases in 2020.

According to the WHO, continuous, homogeneous coverage of at least 95% is required to control measles outbreaks.[5] There are numerous complications connected with measles, some of which are very severe watery diarrhea, ear infections, pneumonia, and encephalitis. This disease can cause cerebral inflammation, resulting in seizures, hearing loss, or cognitive difficulties. Certain risk factors may cause increase the number cases such as age <24 months, absent or incomplete measles vaccination and travel to countries with measles outbreaks.[6]

MATERIALS AND METHODS

Operational definition of measles: Clinical measles was diagnosed in patients with a generalized maculopapular rash of three or more days, a fever of 101°F or more and either cough, coryza, or conjunctivitis.[7]

Pneumonia definition: Pneumonia as defined according to World Health Organization (WHO) criteria, i.e., a respiratory rate > 50 breaths per minute for children ages 2–11 months or > 40 breaths per minute for 12- to 59-month-old children, or the presence of pulmonary infiltration on a chest radiograph.[8]

Central nervous system: The CNS was considered to be involved if there was lethargy, irritability, headache, fits, disorientation, or other neurological deficit.[7]

Weight for age was plotted on National Centre for Health Statistics (NCHS) charts to classify malnutrition as well nourished, mild, moderate, or severe.[9]

Study Design: A descriptive cross-sectional study

Study setting: This study was conducted at the Pediatric Medicine Unit of Chandka Medical College, SMBBMU Larkana.

Study duration: from April 2022 to September 2022.

Sampling technique: non-probability convenience sampling

Sample size: A sample size calculation was made for 150 patients, with a 95% confidence level, a 3% error margin, and taking the 3.7 percent of otitis media patients with measles as,[10]

Inclusion criteria:

- All the children who presented with measles (as per the operational definition)
- Duration of disease > 72 hours
- Age: 1–12 years
- Both genders
- Each vaccinated and unvaccinated patient's status is confirmed by EPI cards.

Exclusion criteria:

- Patients with any chronic illness, such as congenital heart disease, chronic renal disease, etc.
- Immuno compromised patients (assessed on history and medical record)

Data Collection Procedure: The study was conducted at the CMC Children's Tertiary Hospital in Larkana during the period from April 2022 to September 2022. In the study, 150 hospitalised patients with measles, aged one to twelve years old, were recorded. Among 150 patients, 120 (80%) patients with different measles complications according to clinical diagnostic criteria were selected for the study. All aspects of the study were given to all parents of children; written consents were taken; and the confidentiality of the study was assured to all parents of children. Demographically, patients' age groups, gender (male or female), residence (urban or rural), etc., were recorded. Measles-vaccinated patients were verified by Epi cards or parent inquiries. Subsequently, for malnutrition screening and measurement, weight for age was applied according to NCHS charts, and children were then categorised as having well-nourished, mild, moderate, or severe malnutrition. In a study, the most frequent complication of measles pneumonia assessed by WHO criteria was a respiratory rate > 50 breaths per minute for children 2–11 months or > 40 breaths per minute for 12- to 59-month-old children, or the presence of pulmonary infiltration on a chest radiograph. Encephalitis, the most common complication of measles, labelled those cases in which the central nervous system was considered to be involved if there was lethargy, irritability, headache, fits, disorientation, or other neurological deficit, and all patients were given vitamin A orally during admission.

RESULTS

One hundred and fifty hospitalized measles patients were recorded; thereafter, 120 (80%) patients with measles complications were chosen for the study based on inclusion criteria. The average age of all participants was 3.95 ± 0.211 months, with a range of 1 to 12 years. In terms of gender distribution, male 72(60%) participation appeared to be higher than female 48(40%).Table.01.

Table No.1: Demographic& other variable profile of measles complication patients (N=120)

Variable		n	%
Mean age		3.95 ± 0.211 months, range of 1 to 12 years.	
Age	1-4 years	80	66.7%
	5-8 years	28	23.3%
	9-12years	12	10.0%
Gender	Male	72	60.0%
	Female	48	40.0%
Malnourish-ment	Well-nourished	36	30.0%
	Mild-nourished	27	22.5%
	Moderate-nourished	32	26.6%
	Severe-nourished	25	20.8%
Vaccination Status	Vaccinated	70	58.3%
	Un vaccinated	50	41.7%

Distribution by age group: 80 (66.7%) in the 1–4 year age group, 28 (23.3%) in the 5–8 year age group, and 12 (10%) in the 9–12 year age group. Table. 01

According to classification, 36 (30%) of measles patients were well-nourished, while mild and moderate malnutrition appeared to affect 27 (22.5%), 32 (26.6%), and 25 (20.8%) patients, respectively. Table. 01

Vaccination status after verification in measles patients seemed to indicate that 70 (58.3%) of cases were vaccinated, with 19 (27.1%) fully vaccinated (the second dose of the measles vaccine); the remaining 50 (41.7%) children were unvaccinated. Table. 01

The most frequent complications presented among the patients are respiratory illness (pneumonia) in 72 (60.0%), followed by encephalitis in 22 (18.3%), and thereafter acute watery diarrhea and otitis media in 21 (17.5%) and 5 (4.2%), respectively. Fig: 01.

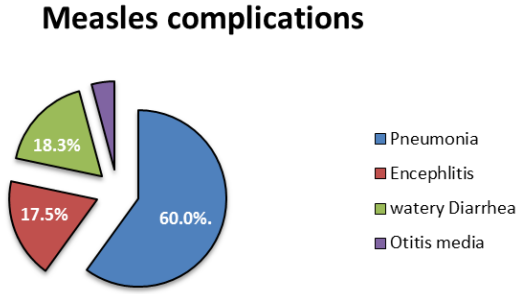

Fig No.1: Complications and outcome in Measles Patients (n=120)

DISCUSSION

Mostly measles patients recover without sequelae, however. Measles can be serious. Most measles-related deaths are caused by complications, with frequent complications of the respiratory tract (pneumonia) accounting for most measles-associated morbidity and mortality caused by the measles virus or by secondary viral or bacterial pathogens.[11]

In our study, the main age range of patients was 1 year to 4 years old, which is similar to the studies from Pakistan[12], Lebanon[13], and Nigeria.[14] According to the CDC's data on measles, children under 5 years of age and adults older than 20 years of age are more likely to suffer from measles complications.[15] According to gender, in the present study, the number of cases was slightly higher among males, coinciding with a number of other reports.[12,16,17]

In the current study, 57% of all patients were vaccinated, 43% were unvaccinated children, and 26% of the vaccinated had received two doses of the measles vaccine. Similar findings appeared to have been made in the study.[12,18] There are two major reasons for immunization failure: first, a failure of the vaccine delivery system to provide potent vaccines to people in need; and second, a failure of the immune response, whether due to vaccine deficiencies or factors inherent in the host.

In this study, statistically 84 (70.0%) of the patients were malnourished, and out of those, 30% of the complications were in severely malnourished patients. Similar findings were reported in several studies.[13,16]

Furthermore, to exacerbate potential measles outbreaks, 12% of Pakistan's population is malnourished, the fourth largest in the world.[19]

Since the beginning of the COVID-19 pandemic, an estimated one out of every two children in Pakistan's Sindh region had missed receiving routine immunizations.[20] In the present study, the most frequent complication was found to be pneumonia (60.0%), which seemed very high. In two studies in Pakistan, pneumonia was reported to be the most common complication among measles patients, accounting for 61.6% and 56.29%, respectively.[21,22]

One in every 1,000 children who contract measles will develop encephalitis (brain swelling), which can cause convulsions and leave the infant deaf or intellectually disabled.[15]

In our study, encephalitis was the second most common complication after pneumonia, accounting for 18.3% of patients, which appeared high when compared to recent study that found rates of 21.7%.[23]

Diarrhea is observed in less than one out of every ten individuals infected with measles.[14] Watery diarrhoea was the third most common complication, accounting for 17.5%, in many studies.[21,23]

According to researched data, it is contrary that in many studies, diarrheal complications are the second-most common complication (especially in Indian studies), while less studies showed that watery diarrhea is the third-most common complication. Although the measles virus was not found in the stools, the findings of this research indicated that measles could be the viral agent producing diarrhea.

Otitis media in measles may be caused by inflammation of the epithelial membrane of the Eustachian tube, which produces blockage and subsequent bacterial infection.[11] The prevalence of otitis media in the current study was 4.2%, which is comparable to the 3.7% and 2.98% reported by Inayat Ullah et al.[21]

CONCLUSION

The common complications of measles are pneumonia, encephalitis, watery diarrhea, and otitis media, which are mostly observed in unvaccinated and malnourished children. Good nutrition and a proper schedule can help improve health and lower the risk of disease in all age groups.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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