

FREQUENCY OF COMPLICATIONS IN MEASLES PATIENTS AT PESHAWAR

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ABSTRACT

Background: Measles is acute highly contagious viral disease with potential to cause serious complications especially in malnourished children. Although safe and effective vaccine is available for its prevention, measles still cause epidemics in different parts of world particularly in developing countries. This study was undertaken to find the frequency of different complications among children admitted with measles.

Material & Methods: This cross-sectional study was carried out in Measles Ward of Sifwat Ghayoor Memorial Government Children Hospital, Peshawar from December 2015 to February 2016. One hundred cases were enrolled through consecutive non-probability sampling technique. Study variables included age, gender, weight, area of residence, mothers education, family income, family type, duration of stay in hospital, disease outcome, vaccination status against measles, contact history and complications. Data was collected on proforma and analyzed using SPSS version 16.0.

Results: Among 100 patients, 57 were males and 43 females. Most 68 (68%) patients belonged to poor socio-economic background with monthly family income below 10,000 PKR. The majority 77 (77%) of mothers of patients were uneducated while only 18 (18%) had primary education. Pneumonia was the major complication accounting for 68% followed by diarrhea 31% and conjunctivitis in 21% patients.

Conclusion: Pneumonia is the major complication in patients with measles followed by diarrhea. Also there is high proportion of vaccinated children who did not complete the vaccination schedule which is a matter of concern for health planners.

KEY WORDS: Measles; Complications; Vaccination; Outbreaks.

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INTRODUCTION

Measles is one of the acute viral illnesses having the potential for severe and life-threatening complications. The disease is preventable by a safe and effective live attenuated vaccine and over the years globally, measles control activities are being very successful in reducing measles incidence and mortality.¹ Throughout the world approximately 45 million new cases of measles occur and almost one million individuals die of measles each year, mostly children belonging to the developing countries.²

According to the World Health Organization

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estimates, in 2000 almost 1.7 million children around the world died of vaccine preventable diseases. Among these deaths in children due to vaccine preventable diseases, measles accounted for the 46% (777,000) of the deaths during the same year.³ In 2008, around 164,000 measles related deaths were reported with the majority of the deaths from the African and South Asian countries having poor infrastructure of health.⁴

After acquiring measles, complications play an important role in measles related deaths rather than measles itself. The most common cause of death in measles patients is severe pneumonia. The mortality and complications rate remain highest among young children below 5 years of age. In developing countries, the high case fatality rate is due to infection occurring at younger age, vitamin A deficiency, low immunity, overcrowding, poor health facilities and malnutrition.^{2,5,6}

Measles is able to cause severe complications among those affected and specially in children who are immune-deficient and malnourished. The most

important complications caused by measles are blindness, encephalitis, ear infections, severe diarrhea, and pneumonia.^{6,7}

World Health Organisation in 1974 initiated the campaign of immunization against vaccine preventable diseases in children while it was started in Pakistan during the year 1978.⁸ In 2011 and 2012, the vaccination coverage against the communicable diseases that are preventable with safe and effective vaccines remained highly variable i.e. between 56-88% among different populations in different provinces of Pakistan.⁹

Industrialised countries of the world like United States and Europe have controlled the incidence of measles by effective vaccination with live measles vaccine.¹⁰ So in order to reduce the incidence, morbidity and mortality from measles infection adequate immunization coverage is required.¹¹

In Pakistan, the coverage for routine measles vaccination has been below 60%.¹² The two major reasons for this low vaccination coverage are the lack of motivation among the health staff and lack of information about the vaccination among the general population.¹³ The risk of developing complications is higher among those children who are not vaccinated as compared to those who have been vaccinated with the live measles vaccine.¹⁴

This study is undertaken with the aim of finding the frequency of different complications among children admitted with measles.

MATERIAL AND METHODS

This cross-sectional study was carried out in the Measles Ward of Sifwat Ghayoor Memorial Government Children Hospital, Peshawar, Pakistan from December 2015 to February 2016.

One hundred children of both genders up to the age of 15 years with measles infection were included in the study through consecutive non-probability sampling technique. Confirmation of measles was established using WHO criteria i.e. fever (38°C or more lasting more than 3 days), maculopapular rash (non-vesicular) and cough, coryza or conjunctivitis.¹⁵ Patients with attendant other than mother or father, having other chronic condition like congenital heart disease, and those with unconfirmed measles were excluded from the study.

Data collection was done using a preformed proforma having closed ended questions after taking an informed consent from the parents. The information source of the patient was parents and the patient's record files. Vaccination status of the patients against measles was confirmed with the help of patient's vaccination card if available or through the verbal confirmation made by parents of the patients. All the relevant investigations like complete blood count, chest x-ray, serum electrolytes and

CSF examination were done where needed. Every patient was observed closely for the development of complications.

The study variables included age, gender, weight, area of residence, mother's educational qualification, family income, disease outcome, duration of stay in hospital, feeding practices, vaccination status of children against measles, contact history with measles patients and complications of measles.

The frequency and percentages were calculated for the categorical variables like gender, address, mothers level of education, type of family, disease outcome, and complications while mean and standard deviation were calculated for quantitative variables like age, weight and duration of stay in hospital. The data was entered and analysed using statistical software SPSS version 16.0.

RESULTS

Among 100 patients, 57 (57%) were males while 43 (43%) females. The mean age was 22.49 ± 18.06 months with a range from 5 to 96 months.

Out of 100 patients, 79 (79%) belonged to the rural while 21 (21%) to the urban areas. Regarding the level of education status of mothers 77 (77%) were uneducated, 18 (18%) had primary education, 4 (4%) were matriculate while only one (1%) had education above matric. The majority of patients 68 (68%) belonged to poor family background with the family income below 10,000 PKR per month while 32 (32%) patients had family income above this level.

The majority of the patients 70 (70%) had positive contact history within the household or neighborhood while 30 (30%) had no such history. (Fig. 1)

Breast feeding was the commonest feeding practice among children below the age of 24 months (63.7%) as compared to formula milk (18.7%) and cow milk (17.5%). (Table 1)

Regarding vaccination status, 52 (52%) patients had one or two doses of vaccination against

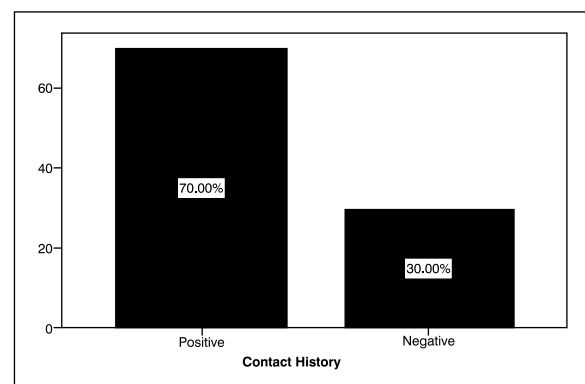


Figure 1: Frequency of contact history in measles patients (n=100)

Table 1: Frequency distribution of feeding with age group

		Age group			Total
		Below 24 months	24 to 30 months	Above 30 months	
Feeding	Breastfeed	51 (98.1%)	1 (1.9%)	0	52 (100%)
	Formula Milk	15 (88.2%)	0	2 (11.8%)	17 (100%)
	Cow Milk	14 (45.2%)	2 (6.5%)	15 (48.4%)	31 (100%)
Total		80 (80%)	3 (3%)	17 (17%)	100 (100%)
p-value		0.000			

Table 2: Frequency distribution of vaccination dose with age group

		Doses			Total
		One	Two	Nil	
Age group	At 9 months	18 (46.2%)	0	21 (53.8%)	39 (100%)
	At 15 months	29 (47.5%)	5 (8.2%)	27 (44.3%)	61 (100%)
Total		47 (47%)	5 (5%)	48 (48%)	100 (100%)
p-value		0.16			

Table 3: Frequency of complications in measles patients (n=100)

Complications	Frequency
Pneumonia	68 (68%)
Gastroenteritis	31 (31%)
Conjunctivitis	21 (21%)
Protein Calorie Malnutrition	6 (6%)
Febrile Fits	2 (2%)
Encephalitis	1 (1%)

Table 4: Gender-wise occurrence of pneumonia in measles patients

		Pneumonia		Total
		Yes	No	
Gender	Male	37 (64.9%)	20 (35.1%)	57 (100%)
	Female	31 (72.1%)	12 (27.9%)	43 (100%)
Total		68 (68%)	32 (32%)	100 (100%)

Table 5: Frequency distribution of pneumonia with vaccination status

		Vaccination Status		Total
		Yes	No	
Pneumonia	Yes	36 (52.9%)	32 (47.1%)	68 (100%)
	No	16 (50%)	16 (50%)	32 (100%)
Total		52 (52%)	48 (48%)	100 (100%)
p-value		0.784		

measles as compared to 48 (48%) non-vaccinated children. However, among 61 patients in age group 15 months or above who were supposed to have their second dose of measles vaccine, 27 (44.3%) were not vaccinated even with single dose and in the remaining 34 (55.7%) vaccinated children 29 (85.29%) had only one dose of vaccine as compared to 5 (14.71%) children who had completed the vaccination. (Table 2)

The duration of stay at hospital ranged from one to nine days with mean of 3.96 ± 1.51 days. The majority of the patients 72 (72%) belonged to the combined families while a lower number of patients 28 (28%) came from the nuclear family set-up.

The frequency of complications is shown in Table 3. The major complication among these patients was pneumonia in 68 (68%) patients. The occurrence of pneumonia was slightly higher in female patients (72.1%) as compared to males (64.9%). Its frequency was almost equal in vaccinated (52.9%) and non-vaccinated (50%) patients. (Table 3 to 5)

Among 100 patients, 3 (3%) died during their stay in the hospital while 97 (97%) recovered and were discharged from the hospital.

DISCUSSION

The epidemics of measles still hit many parts of the world including Pakistan resulting in high morbidity and mortality. The major factors responsible for resurgence of measles include low vaccination coverage, failure of getting the second/booster dose of measles vaccine at 15 months age, vaccine failure, poor health infrastructure and under-nutrition among children in the developing countries.¹⁶

Our study uncovered the fact that high percentage of the vaccinated children who escaped the booster dosage at 15 months age developed measles infection while the proportion of children with measles who received two doses of measles vaccine was very low among the vaccinated patients. Similar results were shown by Rabia et al in their study.¹⁷ Almost 50% of cases had not received even a single dose of measles vaccine. The reasons behind the development of measles in vaccinated children may be low efficacy of vaccine, declining immunity against measles with growing age, inadequate maintenance of cold chain resulting in loss of vaccine potency, faulty techniques of administering the vaccine and low vaccination coverage among the susceptible children. Similar results were reported by many other researchers.^{12,18,19}

According to our study the most common complication among the patients admitted with measles was pneumonia that was present in 68% of cases. These results are in accordance with those of studies conducted by Sultana et al and Joyce et al where pneumonia was observed in 63.6% and 75% cases

respectively.^{5,20}

Diarrhea/gastroenteritis was observed in 31% patients as the second most common complication in our study. Similar results were observed by Sultana et al and Mohammad et al in their studies where diarrhea was the second most common complication of measles, 27.3% and 32% respectively.^{5,21}

Other complications remained on the lower side with conjunctivitis being 21%, protein calorie malnutrition 6%, encephalitis 1% and febrile fits 2%.

Hence, majority of measles patients develop pneumonia as the major complication followed by diarrhea and dehydration and these two complications are responsible for the majority of deaths. Diarrhea also results in malnourishment complicating the already weakened immune status of measles patients and potentiating the effects of measles among these children.¹⁷

Our study found that there is high association of contact with measles patients and subsequent development of disease. History of contact with a case of measles was present in 70% of patients that is very close to the documented secondary attack rate of measles in the literature (around 80%).²⁰

CONCLUSION

Pneumonia is the major complication in patients with measles followed by diarrhea. Also there is high proportion of the vaccinated children who don't return at 15 months of age for the second/booster dose of vaccine resulting in high rates of measles among these partially vaccinated children. This is a matter of concern for health planners to sort out this issue so that in future vaccination efforts get fruitful in preventing the disease.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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None declared.

AUTHORS' CONTRIBUTION

Conception and Design:	MAR, MIA, MAR
Data collection, analysis & interpretation:	MAR, MIA, MAR
Manuscript writing:	MAR, MIA, MAR