ORIGINAL ARTICLE

STUDY OF VACCINATED AND UNVACCINATED MEASLES PATIENTS

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ABSTRACT

Background: Measles is a major killer in children worldwide. Immunization has a main role in reduction of morbidity and mortality of the disease. The objective of this study was to compare the gender, age distribution, and hospital stay in vaccinated and unvaccinated measles patients.

Material & Methods: This cross-sectional comparative study was conducted Department of Pediatrics, Lady Reading Hospital, Peshawar, from April 2012 to March 2013. A total of 566 admitted cases of measles were enrolled. Immune compromised children and children who developed measles within 4 weeks of measles vaccination were excluded. Gender, age in years, and age grouping were demographic variables while hospital stay was research variable. Age was a ratio variable and was analyzed by mean $\pm$ SD, minimum and maximum. All the other variables were categorical and were analyzed by number and percentages.

Results: Out of 566 patients with measles, 310(54.80%) were males and 256(45.20%) were females with a male to female ratio of 1.2:1. The mean age of the sample was 3.18$\pm$2.16 (1-14) years. Out of total 566 patients, 211(39%) were vaccinated and 345(61%) were unvaccinated. Unvaccinated children had longer hospital stay as compared to vaccinated patients.

Conclusion: Measles is not uncommon in children despite vaccination. Its prevalence is higher in younger males. Hospital stay in unvaccinated children is longer than the vaccinated ones.

KEY WORDS: Measles; Vaccination; Immunization; Immunity.

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INTRUDUCTION

Immunization is a sole component of preventive medicine and is an important need of the day. Immunization reduces the cost of treating diseases and thus helps in poverty reduction and socioeconomic development of the country.[1] Globally vaccination against measles was initiated by WHO in 1974[2] and in Pakistan it was started in 1978 with the definitive objective of eliminating measles along with other vaccine preventable diseases like tetanus, diphtheria, tuberculosis, pertussis, and polio.[3]

The measles vaccine has changed the epidemiology of measles dramatically .Once worldwide in distribution, endemic transmission of measles has been interrupted in many countries where there is widespread vaccine coverage. Morbidity and mortality associated with measles decreased prior to the introduction of the vaccine as a result of improvement in the health care and nutrition; however the incidence declined dramatically following the introduction of measles vaccine in 1963.[4]

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The global number of measles deaths dropped by 71% and the number of mortality fell from 542,000 to 158,000 between 2000 and 2011.[2,3,5] The number of new cases fell by 58% over that period. In late 2012, at least 306 children were killed by a deadly outbreak of measles, a huge increase from 2011, when 64 were killed by the disease in Pakistan. The increase was most pronounced in Sindh, where deaths jumped from 28 in 2011 to 210 in 2012. About 50% of those deaths in Sindh took place in December; mainly due to a shortage of vaccine forcing immunization drives to be halted for a short period.[5]

The current recommendation for measles vaccination in Pakistan includes a first dose at 9 month followed by a second dose at 12-15 month of age.[4] Seroconversion is 87% at 9 month and 95% at 12 month because of persisting maternal antibody.[4] The vaccine coverage for measles in Pakistan is below 60%.[6] The key reasons for poor performance are the inadequate service delivery and lack of recipient awareness about the immunization service and its

benefits for their children.[7, 8]

Measles in spite of available vaccination remains a heavy burden on health facilities worldwide especially in developing countries. Globally about 40 million cases of measles occur every year, out of which 70% occur in Africa and Asia. Every year 777,000 deaths occur due to measles in 11 countries.[9] Adequate immunization coverage results in considerable reduction in incidence, morbidity and mortality from measles.[10]

The objective of this study was to compare the gender and age distribution, and hospital stay in vaccinated and unvaccinated measles patients.

MATERIAL AND METHODS

This cross-sectional comparative study was conducted in Isolation Ward, Department of Paediatrics, Lady Reading Hospital, Peshawar, Pakistan from April 2012 to March 2013. Non-probability consecutive sampling technique was used to enroll 566 children.

All children with measles up to 14 years of age who had measles were included. Immune compromised children and children who developed measles within 4 weeks of measles vaccination were excluded. All patients were admitted in Isolation ward through Emergency Day Care Center. Detailed history was taken and general and systemic examination carried out. Measles vaccination was assessed by immunization card or parental inquiry. Full blood count (FBC) with ESR, serum electrolytes and x-ray chest done. I/V line maintained and I/V fluids given as required. Injection ceftriaxone were given 50-100 mg/kg body weight as single dose per day. Antipyretics were given orally in form of syrup paracetamol or ibuprofen or I/V paracetamol as required. Daily progress was assessed by doing FBC and knowing the hydration status. Patients were discharged when they were afebrile and condition was satisfactory. Critically ill patients were also given emergency medications and resuscitation as required.

Gender, age in years, and age grouping were demographic variables while hospital stay was a research variable. Age grouping was; 0-5 years, 6-10 years and 11-14 years. Age was a ratio (quantitative) variable and was analyzed by mean $\pm$ SD, minimum and maximum. All the other variables were categorical and were analyzed by number and percentages. Data analysis was carried by using SPSS version 10 (SPSS Inc., Chicago, IL) for Windows.

RESULT

Out of 566 patients with measles, 310 (54.80%) were males and 256 (45.20%) were females with a male to female ratio of 1.2:1. The mean age of the sample was 3.18$\pm$2.16 (1-14) years. Table 1 shows frequency across gender of measles vaccination in measles patients. Males are dominating in both the vaccinated and unvaccinated groups.

Table 1: Measles vaccination in measles patients across gender.

Gender	Vaccinated n (%)	Unvaccinated n (%)	Total n (%)
Male	114 (51.6)	196 (56.8)	310 (54.7)
Female	107 (48.4)	149 (43.2)	256 (45.3)
Total	221 (39)	345 (61)	566 (100)

Table 2: Measles vaccination in measles patients across age groups.

Age group	Vaccinated n (%)	Unvaccinated n (%)	Total n (%)
0-5 years	190 (85.9)	299 (86.6)	489 (86.4)
6-10 years	28 (12.7)	42 (12.2)	70 (12.4)
11-14 years	3 (1.4)	4 (1.2)	7 (1.2)
Total	221 (39)	345 (61)	566 (100)

Table 3: Measles vaccination in measles patients across hospital stay.

Hospital stay (Days)	Vaccinated n (%)	Unvaccinated n (%)	Total n (%)
1	29 (37.7)	48 (62.3)	77 (13.6)
2-3	116 (39.6)	177 (60.4)	293 (51.8)
4-6	68 (37)	116 (63)	184 (32.5)
>6	8 (66.6)	4 (33.4)	12 (2.1)
Total	221 (39)	345 (61)	566 (100)

Table 2 shows frequency across age groups of measles vaccination in measles patients. Here age group of 0-5 years is dominating by frequency in both the vaccinated and unvaccinated groups.

Table 3 shows duration of hospital stay in patients with and without measles vaccination. Unvaccinated children had longer hospital stay as compared to vaccinated patients.

DISCUSSION

Measles is a highly contagious and one of the most devastating infectious diseases of human being. It was responsible for millions of deaths annually worldwide before the introduction of measles vaccine. Despite the success of the current measles vaccine in controlling disease in industrialized countries, the importance of vaccine failure has become increasingly apparent in the developing countries like Pakistan.

In the present study, measles was more common in males as compared to females. This coincides with a number of reports,[11-13] while in other studies the number of measles cases was higher among females,[13] or no difference between sex were observed.[14] In present study, majority of the measles cases were between 0-5 years of age. Similar findings were reported by Muhammad et al[11], Khan et al[12] and Junejo et al[13] from inside the country and Albahadle and Abass[14] and Younis[15] internationally. However other authors reported measles predominantly in the age group of 5 to 12 years.[16-18] This indicates that children of this age are still unprotected against measles. Possible reason for this may be shortage of vaccine, religious beliefs, and internal displacement due to flood and uncertain security conditions in Khyber Pukhtunkhwa.

In our study, 39% of measles patients were already vaccinated against measles. Almost similar findings were reported by Rahim et al[19] and Husain et al[20] from inside the country and Slater et al [21] from Israel. However, Tariq,[6] Khan et al[12] and Aurangzeb et al[9] reported measles in 50%, 51% and 57% of vaccinated cases in their studies respectively. In other local and international studies even higher figure i.e., 66.6%,[22] 71.6%[16] and 79.4%[17] of measles cases in previously vaccinated children were reported.

Reports of such a large number of measles cases among previously vaccinated children raise concern about vaccination failure. Vaccination failure may be due to immunization at less than one year of age or administration of nonviable, low potency vaccine that may have been improperly stored or handled.[23] Neutralizing effect of maternal antibodies to suppress the effect of measles vaccine up to 12 months or beyond is widely accepted. Thus giving booster doses of MMR ideally or a measles vaccine minimally at 15 months after a measles vaccine at 9 months is very important.[24]

It is therefore recommended that reduction in measles cases and hence mortality and morbidity can only be achieved by increasing immunization coverage, reducing regional variations in measles coverage levels, improving nutritional status of infants and children, maintaining cold chain for vaccine, training of EPI technicians on proper injections and enforcing two dose measles vaccine.

This study does not reflect the true prevalence of measles vaccine failure in the total population, because it is a hospital based study and many cases of measles might have not been brought to the hospital due to different reasons and beliefs as it is considered a natural event and the majority of measles cases are not brought to the health facilities due to this false belief. Hence a multicenter and a community based study may be more fruitful and meaningful.

CONCLUSION

Measles is not uncommon in children despite vaccination. Its prevalence is higher in younger males. Hospital stay in unvaccinated children is longer than the vaccinated ones.

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