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Prevalence of pneumonia associated with measles among hospitalized children in Maiwand Teaching Hospital, Kabul, Afghanistan

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Abstract. Objective: The aim of this study is to determine the prevalence of measles and pneumonia associated with measles among children who were admitted to the pediatric department of Maiwand Teaching Hospital, Kabul, Afghanistan. **Study Design:** Descriptive, Cross-sectional. **Place and Duration:** Pediatrics department of Maiwand Teaching Hospital, Kabul, Afghanistan, for six months (April 2022 to October 2022). **Methods:** A total of 557 patients, including children and infants of both genders, were included in this study. Patients' diagnosed measles and the frequency of pneumonia among all patients were assessed. The SPSS 22.0 version was used to analyze all of the data. **Results:** The average rate of measles was found to be 22.8% among hospitalized children. There were 289 (51.9%) male patients and 268 (48.1%) female patients. In terms of age, 17 (3.1%) of the patients were under six months old, 150 (26.7%) were 6-12 months old, 310 (55.7%) were 13-60 months old, 68 (12.2%) were 61-120 months old, and 12 (2.2%) were more than 120 months old. The prevalence of pneumonia was found among 121 (21.7%) cases. 112 (20.1%) cases had received the measles vaccination. **Conclusion:** This study found that the prevalence of pneumonia among children with measles was 21.7%, which is relatively high. It was due to a lack of vaccinations. It can be controlled by providing awareness about vaccination to the parents of children.

Keywords. Pneumonia, Measles, Children, Infants, Prevalence

Background

Measles is a very highly contagious, vaccine-preventable disease caused by a virus that is transmitted by air and through direct contact with infected cases. Unvaccinated young children are at the highest risk of measles and its complications (e.g., pneumonia and encephalitis), including death. Measles outbreaks can result in epidemics with a high case fatality rate, especially among young, malnourished children. ⁽¹⁾ The disease is a common cause of childhood morbidity and mortality across the globe, particularly in developing countries. However, measles is still affecting the developing countries due to insufficient coverage and

improper handling of vaccines. ⁽¹⁾ Measles is endemic in Afghanistan, with almost all provinces reporting suspected cases every year. From January 1, 2021 to January 29, 2022, 35 319 suspected measles cases were reported in Afghanistan, of which 3221 (9%) were laboratory-confirmed by Ig M-ELISA in the seven reference laboratories (one national and six regional). Most of the suspected measles cases (91%) occurred among children less than 5 years of age. During the same period, 156 measles deaths were reported among the confirmed cases (CFR = 4.8%), with more than 97% of the fatalities registered among children less than 5 years of age. Although the number of deaths is relatively low, the rapid rise in cases suggests that the trend of reported deaths will continue to increase sharply in the coming weeks. The most affected provinces, with the highest number of reported cases (confirmed and suspected), are Balkh, Ghazi, Helmand, Kandahar, Kabul, Paktika, and Paktya. ⁽²⁾ Measles is still an important public health problem worldwide, causing significant morbidity and mortality. Measles can be serious, being associated with many complications and hospital admissions. According to the World Health Organization (WHO), over 140,000 people died from measles in 2018, the majority of whom were children under the age of five, despite the fact that it is a vaccine-preventable disease that can be avoided through immunization program strategies guided by laboratory-supported surveillance. ^(3, 4) Another study conducted by Maria Gianni Ki et al. that assessed *the " Measles epidemic in the pediatric population in Greece during 2017–2018: Epidemiological, clinical characteristics and outcomes"* was shown which During the 2017–2018 measles outbreak in Greece, we learned that measles is still not an innocent viral infection, as it is characterized by high morbidity rates and complications. Pockets of unvaccinated populations could be the source of new outbreaks, resulting in significant costs in public health. To address future challenges, high measles vaccination coverage should be achieved, as well as closing immunity gaps in the population and ensuring high-quality laboratory surveillance. ⁽⁵⁾ On the other hand, in a study by Jamison Pike et al. under the title "Societal Costs of a Measles Outbreak," it was show that recent cent increases in incident measles cases in the US and across the globe underscore the need to more fully understand the societal cost of measles cases and outbreaks, an under-vaccination. equences of under vaccination. Our estimates can provide valuable inputs for policymakers and public health stakeholders as they consider budget determinations and the substantial value associated with increasing vaccine coverage and outbreak preparedness, as well as the protection of society against vaccine-preventable diseases, such as measles, which are readily preventable with high vaccination coverage. ⁽⁶⁾ Another study, "Measles in Afghan Refugees: Challenges, Efforts, and Recommendations," conducted by Zarmina Islam et al., revealed that a concurrent rise in COVID-19 cases, poor healthcare capacity in Afghanistan, higher transmission of measles due to internal displacement, and current evacuation efforts predispose Afghanistan and other nations to measles outbreaks. Additional barriers to becoming refugees complicate and delay evacuation efforts, possibly endangering the security of Afghan refugees. Given the situation, Afghan refugees need immediate international health aid to increase vaccination and awareness efforts. ⁽⁷⁾ In addition, Hanan Al-Marbouai's study titled "An Imported Measles Outbreak in Al Buraimi Governorate, Oman, in April 2020" revealed that the greatest challenge in eliminating measles is In Oman is imported cases among non-Omani expatriates and unvaccinated children. It should therefore be a priority to vaccinate all expatriate children. Only when everyone is vaccinated in Oman can the goal of creating a measles-free country be realized. ⁽⁸⁾ As you know, recently, the prevalence of measles and the resulting deaths have increased in the country, and the cause of death of most children with measles is due to its complications, so knowing the prevalence and complications of this disease will help in the treatment and care of these patients, Also, With the studies

conducted, we concluded that few studies have been received to assess the measles outbreak at a specific location in Afghanistan, so we decided to choose the outbreak of measles among children and its related complications "specific Pneumonia" at Maiwand Hospital because studying dying the prevalence of measles and its associated complications is useful for health system planners and public health professionals. Also, knowing the burden of this disease in a population is necessary to provide the resources needed to finance special services or health promotion programs. In the hope that the research conducted by us will provide more information on the identification of measles and its complications, and thus improve health services, The determination of prevalence is a very useful measure in public health, especially for service planning, because it allows us to understand the burden of the health and social care system at a specific point in time. Therefore, we decided to choose this study.

Methods

A cross-sectional study was conducted to find out the frequency of pneumonia associated with measles among children hospitalized at Maiwand Teaching Hospital. This was a 6-month hospital-based, retrospective record-based study that was done on pediatric patients who were clinically diagnosed with measles in the pediatric department of Maiwand Teaching Hospital, Kabul, Afghanistan, from April 2022 to October 2022.

Study population and sample size

Five hundred and fifty seven (557) patients, both male and female, are considered the study population.

Data collection method

An integrated investigation form was used to find the prevalence of measles and pneumonia associated with measles among children hospitalized at Maiwand teaching hospital. It was filled by the data collector according to the patient file and registration books.

Inclusion criteria

Infants and children diagnosed with measles are admitted to Maiwand Pediatric Service.

Exclusion criteria

Children below one month of age and older than 15 years, Post-measles patient with more than one weak, Children with measles who have incomplete files, Children with measles whose files are not available or lost.

Data analysis procedure

All section forms were carefully checked, and variables from the forms were entered into the Statistical Package for Social Sciences (SPSS) version 22. All the variables that are included in the form will be checked for mistakes. Descriptive statistics were applied to the data for the determination of percentages and frequencies.

Ethical consideration

The complete written research protocol and all data collection tools were checked for approval by the ethical review committee (ERC) of the Kabul University of Medical Science.

The privacy and confidentiality of the patients are maintained by providing codes to each key informant, and their unrecognizability is maintained throughout the research process.

Results

During the study period, a total of 2441 patients were admitted, with 557 of them being confirmed to have measles. The average rate of measles was found to be 22.8% among hospitalized children. There were 289 (51.9%) male patients and 268 (48.1%) female patients. In terms of age, 17 (3.1%) of the patients were under six months old, 150 (26.7%) were 6-12 months old, 310 (55.7%) were 13-60 months old, 68 (12.2%) were 61-120 months old, and 12 (2.2%) were more than 120 months old.

Table 1: Demographic information for all enrolled cases.

Characteristics	Frequency	Percent
Less than 6 months	17	3.1
6 months – 1 years	150	26.9
1-5 years	310	55.7
5-10years	68	12.2
More than 10 years	12	2.2
Gender		
Male	289	51.9
Female	268	48.1

Table 2: shows the percentages of rural and urban families, which were 77.6% and 22.4%, respectively.

Parameter	Frequency	Percent
Urban	432	77.6
Rural	125	22.4
Total	557	100

Table 3: Prevalence of pneumonia and vaccination status among all patients.

Characteristics	Frequency	Percent
Pneumonia		
Yes	121	21.7
No	436	78.3
Vaccination status		
Yes	112	20.1
NO	362	65.1
Unknown	82	14.7

Table 4: Shows the percentages of mortality, LAMA, discharge, and referred patients, which were 0.5%, 5.6%, 91.6%, and 2.3%, respectively.

Parameter	Frequency	Percent
Discharge	510	91.6
LAMA	31	5.6
Dead	3	0.5
Referred	13	2.3
Total	557	100

Discussion

The present study aimed to determine the prevalence of pneumonia associated with measles among children. According to our study, 2441 patients were admitted during the study period, and among them, 557 were confirmed to have measles. The average rate of measles was found to be 22.8% among hospitalized children. There were 289 (51.9%) male patients and 268 (41.8%) female patients. In terms of age, 17 (3.1%) of the patients were under six months old, 150 (26.7%) were 6–12 months old, 310 (55.7%) were 13–60 months old, 68 (12.2%) were 61–120 months old, and 12 (2.2%) were more than 120 months old. The prevalence of pneumonia was found in 121 (21.7%) cases. The measles vaccination had been administered to 112 (20.1%) of the cases. The measles vaccination had been administered to 112 (20.1%) of the cases. In this cross-sectional study, 557 patients of both genders were enrolled. Males made up the majority of patients (51.9%). Our finding is comparable to previous study.⁽¹¹⁾ Our study is related to another study on the prevalence of pneumonia and the distribution of measles cases by vaccination status.⁽¹⁴⁾ Most of the children in our study were 1–5 years old, which is consistent with international studies from the Congo⁽¹⁹⁾ and Japan.⁽²⁰⁾ Our findings are also in line with the observation reported of pneumonia among measles patients admitted to a public hospital in Karachi.⁽¹³⁾ Our study finding is different from the finding of a 2021 cross-sectional study conducted by Asadullah Khan et al. under the title "Prevalence of Pneumonia Associated with Measles Among Infants and Children," which reported about 63.3%.⁽⁹⁾ Our study finding is also different from the finding of a study conducted by Shaheed Khan et al. under the title "Prevalence of pneumonia associated with measles among infants and children hospitalized in Khyber Teaching Hospital Peshawar, KPK, Pakistan," who reported about 40.4%.⁽¹⁰⁾

Conclusion

This study found that the prevalence of pneumonia among children who had measles was 21.7%, which is relatively high. It was due to a lack of vaccinations. It can be controlled by providing awareness about vaccination to the parents of children. Our study reflects data only from a single health center; it cannot represent the whole country. However, it can highlight the immunity gap.

Recommendations

- The awareness of parents about the benefits of vaccination should be raised.
- Diagnosing cases of measles in time to prevent its complications.

- Such studies should be done in an observational way and based on primary data.
- This should be done on a wider scale.

Limitations

This research was done on patient files and secondary data, and the diagnosis of patients with pneumonia and measles was made based on clinical symptoms and signs, and we did not have direct contact with the patients. And since it was done only in one health center, it does not show the true prevalence in all populations and requires more and wider studies.

Author's contribution

All authors equally contributed. Z.H drafted the manuscript and analyzed the data; QK & AM data collection YB & AA translated the initial manuscript from Persian to English, Z.H intensively reviewed the manuscript, and responded to the reviewer's comments.

Conflicts Of Interest

"The author(s) declare(s) that there are no conflicts of interest regarding the publication of this paper."

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