

Prevalence Of Measles In Vaccinated And Unvaccinated Children In QHAMC, Nowshera.

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ABSTRACT

Objective: Measles is an infectious disease that is a prodigious threat to mortality under 5. This is cross sectional study was conducted to find the prevalence of measles vaccination and its effectiveness.

Study design: A Cross Sectional Observational Study.

Place and duration of study : Department of Paediatrics Qazi Hussain Ahmad Medical Complex, Nowshera from 20-june 2022 to 20-july 2023

Materials & Methods: In this hospital based study a total of 606 samples were taken of children under 5 years of age visiting QHAMC, Nowshera. A proforma was structured which asked about the Bio data, Vaccination status and Measles contraction history. MSWord and. SPSS software were used for data management and presentation.

Results: Results showed that Amongst 606 participants, 339(55.94%) were vaccinated while 267(44.06%) were unvaccinated. In these 339 vaccinated children 147(43.36%) children had measles while 192(56.64%) were free of measles. In the 267(44.06%) unvaccinated children 168(62.92%) had measles while 99(33.08%) were free of measles

Conclusion: This study concludes that Measles prove to be a huge burden on health and economical sectors of the state and measures need to be taken seriously, out of which measles vaccine prove to be very effective. Steps are need to be taken to ensure the administration of these vaccines to all the population to reduce further burden. Also more effective vaccines and strategies need to be developed.

Keywords: Measles, Children under 5 years of age, vaccination, mortality.

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Introduction

Measles is an infectious viral illness that mainly occurs in children below the age of five years. Measles remains a significant public health threat even though a safe and effective vaccine exists for it, particularly in the developing world. The WHO approximated that in 2018, measles killed 136,000 people, and 90% of these were children below the age of five [1]. The WHO Expanded Program on Immunization (EPI) puts the global annual child mortality from measles at 1.6 million in developing countries, ranking it among the EPI target diseases' leading causes of death [2]. Measles was a major global problem before the development of the vaccine and affected about 135 million people and killed 6 million every year [3]. Measles is an infectious disease that is caused by the rubella virus belonging to the Morbillivirus genus of the Paramyxoviridae family. It is an enveloped, single stranded, negative sense RNA virus that spreads through respiratory droplets. The virus does not infect animals and thus humans are the natural reservoir of the virus. The WHO describes a clinical case of measles as any individual with fever, maculopapular rash, cough, runny nose or conjunctival infection [4]. Measles, on the other hand, can lead to severe complication in the persons with the following conditions; AIDS, congenital immune deficiencies or persons on cancer treatment. These include pneumonia, diarrhoea,

Otitis media, and croup some of which may be fatal [5]. Measles is still a public health issue of concern although there is a live attenuated vaccine that is safe and effective. The vaccine is administered at 9 and 15 months and may be administered alone or with mumps and rubella referred to as MMR [6]. In Pakistan, there is some problem with the coverage of measles vaccination though it is improving, these problems are related to infrastructures and people's awareness. WHO has reported that 64 people died from measles in Pakistan in 2011, which proves the need to enhance the vaccination activities [7]. Studies have also shown that when the measles vaccine is administered early, it provides good immunity and the rate of the disease can also be brought down. For instance, while conducting a study, Laura M et al identified that measles is better protected by infants under 9 months through vaccination [8]. Therefore, the objective of this cross-sectional study was to establish the prevalence of measles among vaccinated and unvaccinated children under five years of age attending Qazi Hussain Ahmad Medical Complex (QHAMC) in Nowshera, Pakistan. The study aimed at evaluating the effectiveness of the measles vaccine in this population group and the outcomes concerning the impact of vaccination on the frequency of measles.

Methods

The research was cross-sectional observational conducted at QHAMC Nowshera on children below five years of age. Ethical clearance was sought from the Medical Education Department regarding the study. The study targeted 606 children and the sampling technique that was used was the stratified sampling. The respondents were asked to fill questionnaires that included biodata, vaccination history, and history of previous measles attack. The study period was from 20-june 2022 to 20-july 2023

Data Collection

Questionnaires with closed-ended questions were administered to the parents or guardians of the children after seeking their consent. The proforma gathered biodata, vaccination status and history of measles infection.

Statistical Analysis

Data were analyzed using statistical package for social sciences (SPSS) version 24. 0. Frequency distribution was used to analyze the data and chi-square test was used to determine the relationship between vaccination and measles. Data was analyzed and summarized in terms of tables and percentages.

Results

Out Of the 606 participants, 339 were vaccinated, which is 55. 94%, while 267 participants were unvaccinated, which is 44. 06%. Out of the vaccinated children 147 were affected 43. 36% with measles and 192 were

Not affected 56. 64%. Out of the unvaccinated people, 168 (62. 92%) developed measles while 99 (37. 08%) did not. The results of this study reveal a higher rate of measles in children who did not receive a vaccine compared to those who were vaccinated. The results of the chi-square test showed that there was a significant relationship between vaccination and measles infection ($p < 0. 05$).Results shows in figure 1,2 and table 1 to 4.

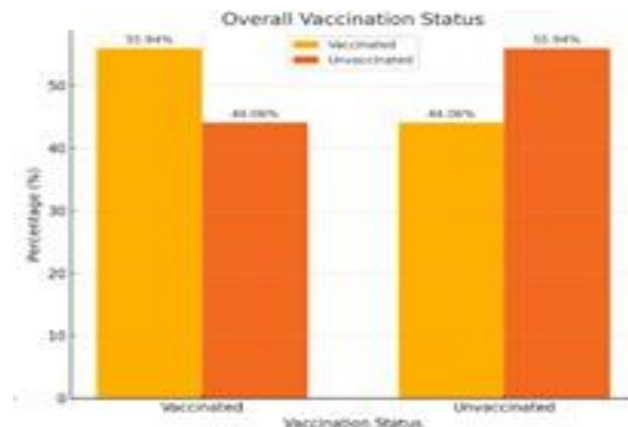
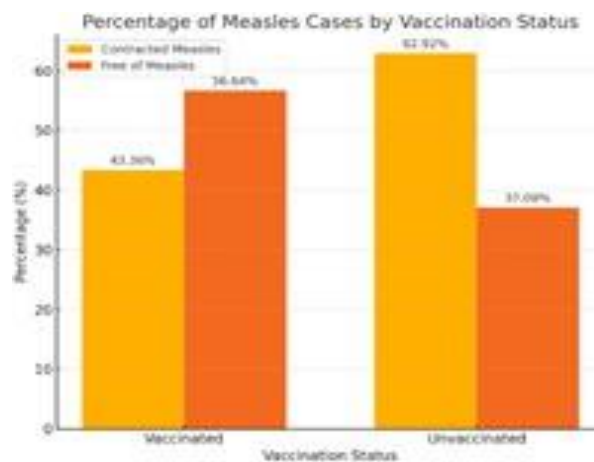


Table 1: Vaccination Status of Participants

Status	Number of Cases	Percentage (%)
Vaccinated	339	55.94
Unvaccinated	267	44.06
Total	606	100

Table 2: Measles Cases in Vaccinated Children

Status	Number of Cases	Percentage (%)
Contracted Measles	147	43.36
Free of Measles	192	56.64
Total	339	100

Table 3: Measles Cases in Unvaccinated Children

Status	Number of Cases	Percentage (%)
Contracted Measles	168	62.92
Free of Measles	99	37.08
Total	267	100

Table 4: Summary of Measles Cases by Vaccination Status

Vaccination Status	Contracted Measles	Free of Measles	Total
Vaccinated	147	192	339
Unvaccinated	168	99	267
Total	315	291	606

Discussion

The results of this study are in concordance with the previous studies that have underlined the importance of vaccination in the decrease of measles cases among children. Measles is still a significant threat to the health of the people, especially in areas where children have not been vaccinated. The findings of the present study of higher infection rates of measles amongst the unvaccinated children supports the fact that measles vaccine is effective in preventing the disease. Tahir et al. (2020) cross-sectional study conducted in District Bannu, Pakistan revealed a high proportion of measles in unvaccinated children. Among 7200 children, 578 had measles; 88. 41% of whom were not vaccinated [9]. This is in support of our study where we recorded that 62. 92% of children who had not received the vaccination were affected by measles as compared to 43. 36% of children who had received the vaccination. The results also call for better vaccination campaigns and health promotion activities to enhance the level of vaccination. In their study, Laura et al. (2020) pointed out that early vaccination can help to decrease the number of cases of measles morbidity and mortality. They found that infants who were vaccinated before 9 months were more protected from measles than the others [10]. Our study also goes with the idea of early vaccination as majority of the vaccinated children did not get affected by measles. This discovery calls for early administration of the vaccine to boost immunity among the children.

Also, the WHO's EPI has been instrumental in the reduction of measles incidence across the world. This is evident in the countries where vaccination has been implemented since incidence of measles has reduced where there is high vaccination coverage [11]. However, in Pakistan, there are some barriers like infrastructure problems, low community awareness, and vaccine resistance that affect the program. These challenges are well captured in our study with a large proportion of children still remaining unvaccinated and thus susceptible to measles. A dynamic modeling study by Fu et al in ten high burden countries showed that MCV1 reduced measles cases by 66% while MCV2 and SIA reduced the cases to 90% [12]. This substantial reduction in measles cases emphasizes the need for the first dose and the second dose of the vaccine and other immunization activities to achieve adequate coverage. Measles cases remain a concern in different regions of the world even though vaccines for the disease are available. Gastañaduy et al. (2021) stated that although the overall incidence of measles has decreased, the outbreaks are still seen because of the inadequate vaccination [13]. Our study supports this inference, as the frequency of measles was significantly higher among the children who had not received the vaccine. This means that, there is need to ensure and sustain high levels of vaccination in order to reduce incidences and contain the spread of the disease[14]. The drawbacks of our study are the small number of participants and the short period of observation. More research with larger sample

size and longer observation duration can provide more specific data regarding the effectiveness of measles vaccination. Furthermore, the barriers of vaccination including access to the vaccines and awareness of the vaccination programs should be eradicated to improve the vaccination [15].

Conclusion

In this study, it becomes clear that measles vaccination assists in the decrease of the disease occurrence among children. This distribution indicates that children who have not been vaccinated are at a higher risk of contracting measles hence the need to step up the vaccination and other health promotion activities to have more children immunized. Thus, the challenges of vaccination, early and complete immunization can be solved, and the effect of measles can be minimized to protect the at-risk population.

Limitations

The weaknesses of this research are that it has a small number of participants and a short time frame, which might not reflect all the fluctuations in measles occurrence. However, data collection was restricted to a single medical complex, which may have an impact on the results' generalization. More studies should be conducted with different and more numerous participants.

Future Directions

Further studies should therefore be conducted on a wider and more diverse population in order to increase the external validity of the results. This is why there is a need to undertake longitudinal investigations in order to evaluate the sustained efficacy of measles vaccination campaigns and the

role of booster doses. Also, strategies to counter vaccine misinformation and strengthening of health systems are vital for the elimination of measles.

References

1. World Health Organization: Measles. Available from: <https://www.who.int/news-room/fact-sheets/detail/measles>
2. Gastañaduy PA, Goodson JL, Panagiotakopoulos L, Rota PA, Orenstein WA, Patel M: Measles in the 21st century: progress toward achieving and sustaining elimination. *J Infect Dis.* 2021, 224. doi:10.1093/infdis/jiaa793
3. Vaccine preventable diseases – Federal Directorate of Immunization, Pakistan. Available from: <http://www.epi.gov.pk/vaccine-preventable-diseases/>
4. Fu H, Abbas K, Klepac P, van Zandvoort K, Tanvir H, Portnoy A, et al.: Effect of evidence updates on key determinants of measles vaccination impact: a dynamic modelling study in ten high-burden countries. *BMC Med.* 2021, 19:161-9. doi:10.1186/s12916-021-02157-4
5. Tahir MJ, Wazir MZ, Ullah I: Barriers to immunization in Pakistan. *Annals of Allied Health Sciences.* 2020, 6:1. Available from: <https://www.jpma.org.pk/PdfDownload/8611>
6. Expanded Programme on Immunization. World Health Organization. Available from: https://www.who.int/immunization/programmes_systems/supply_chain/benefits_of_immunization/en/
7. World Health Organization: Measles mortality reduction initiative. Available from: <https://www.who.int/news-room/fact-sheets/detail/measles-mortality-reduction-initiative>
8. Laura M, et al.: Efficacy of early measles vaccination: a study in infants. *J Pediatr.* 2020. Centers for Disease Control and Prevention: Measles data and statistics. Available from: <https://www.cdc.gov/measles/downloads/measlesdataandstatsslideset.pdf>

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Prevalence Of Measles In Vaccinated And Unvaccinated Children In QHAMC, Nowshera.

9. Centers for Disease Control and Prevention: Progress toward regional measles elimination — worldwide, 2000–2020. Available from: <https://www.cdc.gov/mmwr/volumes/72/wr/pdfs/mm7246a3-H.pdf> **Page-86-87**
10. World Health Organization: Measles - key facts. Available from: <https://www.who.int/news-room/factsheets/detail/measles>
11. Centers for Disease Control and Prevention: Measles cases and outbreaks. Available from: <https://www.cdc.gov/measles/cases-outbreaks.html>
12. World Health Organization: Global progress against measles threatened amidst COVID-19 pandemic. Available from: <https://www.who.int/news/item/10-11-2021-global-progress-against-measles-threatened-amidst-covid-19-pandemic>
13. PLOS ONE: Epidemiology of measles cases, vaccine effectiveness, and performance towards measles elimination in The Gambia. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0250935>
14. Centers for Disease Control and Prevention: Measles — United States, January 1, 2020–March 28, 2024. Available from: <https://www.cdc.gov/mmwr/volumes/72/wr/mm7246a1.htm>
15. World Health Organization: Measles vaccines: WHO position paper. Wkly Epidemiol Rec. 2019, 94:85–104. Available from: <https://www.who.int/publications/i/item/measles-vaccines-who-position-paper-april-2019>

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