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A CROSS-SECTIONAL RESEARCH FOR THE ASSESSMENT OF VACCINATION STATUS ASSOCIATION WITH INFECTION OF MEASLES

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Abstract:

Objective: *To assess the vaccination status amongst authenticated cases of measles and to evaluate the relationship between incidence of measles infection and status of vaccination.****Methods:*** *A cross-sectional survey was conducted at Services Hospital, Lahore from the period of January 2016 - April 2016. Both male and female were part of the study. Their ages were ≤ 09 months. They also met the standard definition set by World Health Organization. From day 4 and day 28 of the rash to test for measles IgM antibodies, three t0 five ml of blood was collected as a sample from every subject. After labelling to samples, they were further dispatched to National Measles Laboratory, National Institute of Health (NIH) Islamabad in reverse cold chain. Confirmed measles group was of those patients who were tested +ve for IgM antibodies. Suspected measles group of patients were examined negative for measles IgM antibodies. Windows SPSS was utilised for analysing of both the groups for status of vaccination, frequency of infection of measles against the total doses of measles vaccine received. By using Chi-square test, the comparison of frequencies of vaccination amongst confirmed cases of measles with suspected cases of measles for statistical importance. P-value less than 0.05 was taken as significant.****Results:*** *Total 915 cases were investigated in which 572 were confirmed measles patients; 72 were vaccinated while 258 had been never vaccinated to avoid the disease. From suspected measles patients, 128 were vaccinated adequately. In both groups, status of vaccination was unknown in a quarter of subjects. A considerable relationship was observed between the status of vaccination and infection of measles with greater measles frequency in unvaccinated cases as compared to the vaccinated patients.****Conclusion:****It was concluded that rate of vaccination amongst non-measles patients was considerably greater than those of measles patients. 12.6 percent of the cases were infected with disease albeit their complete vaccination.*

Keywords: *Children, measles, MMR vaccine, immunization, vaccine.*

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INTRODUCTION:

Measles is a widely known infectious disease. 30 million people are affected by it per year. It has one hundred percent of rate of infectivity [1, 2, 3]. It is responsible for millions of causalities of children per year. Notwithstanding the accessibility to vaccine in developing countries, about 66 percent deaths are caused due to this disease [3, 4]. Insufficient health care facilities and rampant malnutrition may expand this infectious disease up to ten percent [4]. Since no valid treatment has been discovered, vaccine is the last choice of the affected cases. Endemic measles transmission is interrupted by the use of its vaccination. The usage of its vaccine has certainly dropped the death figure up to 79 percent from the period of 2000 to 2014 [1, 4, 5]. However, the situation in Pakistan during these years remained pathetically worsened. In the year 2013, 5969 lab confirmed cases were reported which were significantly higher than 2676 reported confirmed cases in the year 2012. Pakistan has the unfortunate distinction of being the highest measles reporting countries in the Eastern Mediterranean area [6, 7]. This calls for urgency in terms of inadequate method adopted or ineffective vaccine administration at the wrong time in the country. These things are ought to be investigated properly [8]. In Pakistan the recommended dose of vaccine is on the age of nine months however, this was extended to the age of fifteen months at the recommendation made by various agencies such as World Health Organisation, United Nations International Children's Emergency Fund in the year 2009 [10,11].

The official record in Pakistan has shown abysmal results in which 80 percent vaccine coverage was reported with the first dose in 2012 and in the same year the coverage was reported 53 percent with the second dose. The coverage was reported 63 percent in the year 2014 [12]. These two factors are sufficient to narrate the reasons of increasing measles cases in Pakistan. During a period of measles epidemic, a Karachi based research has shown that 78 percent of children did receive minimum a single dose of measles vaccine. Nonetheless, antibodies of measles which suggest immunity to fight against the disease were present with the percentage of 55 amongst children [8]. It has been observed with grave concern that the number of vaccinated cases is emerging with every passing year. The purpose of our study was to assess the vaccination status amongst authenticated cases of measles and to evaluate the relationship between incidence of measles infection and status of vaccination.

METHODS:

A cross-sectional survey was conducted at Services Hospital, Lahore from the period of January 2016 - April 2016. The formula n= (Z2P (1P))/e2 was used for the calculation of sample size i.e. 317. Minimum sample desired for the study was 317 but it was extended up to 915 subjects for enhanced reliability and to cater the drop out cases during the whole survey. Both male and female were part of the study. Their ages were ≤ 09 months. They also met the standard definition set by World Health Organization. The definition of suspected measles was in the following words narrated: "'any person with generalised maculopapular rash and fever plus one of the following: cough or coryza (runny nose) or conjunctivitis (red eyes)' or any individual who is declared suspicious by the physician in term of measles". The cases which lack information regarding vaccination status, age and epidemiology number were dropped from the research. The conducted survey was based on the measles case-based surveillance. All the medical care centres were frequently visited by surveillance officers to register the desired patients infected with the suspicion of measles. Collected data was entered on the pre-established proforma containing information such as gender, status of vaccination, age, reporting institute and address of the reporting centre. Status of vaccination was either confirmed from the individuals verbally or from the record of vaccination cards. Transfer of the data was made on the line list of the EPI regularly. From day 4 and day 28 of the rash to test for measles IgM antibodies, three t0 five ml of blood was collected in a sterile syringe as a sample from every subject. After labelling to samples and allotting an EPID number they were further dispatched to National Measles Laboratory, National Institute of Health (NIH) Islamabad in reverse cold chain with the temperature varying from 2-8 degree centigrade. Confirmed measles group was of those patients who were tested +ve for IgM antibodies. Suspected measles group of patients were examined negative for measles IgM antibodies. In Pakistan, the minimum age of first inoculation against measles is 09 months. To meet our objective, analysis of both groups having ages ≤ 09 months was carried out by using windows SPSS for their status of vaccination and other required parameters. Analysis was also made by keeping in view the status of vaccination, by the time of vaccination and the level of vaccination (Partially or completely vaccinated)

Additionally, analysis was carried out to check the number of doses administered against the frequency

of measles infection cases. In the end, ultimate analysis was carried out to see the relationship between the presence of measles cases and vaccination for measles by comparing the status of vaccine with suspected and confirmed measles cases. Chi-square was utilised to determine the statistical significance. P-value less than 0.05 were considered statistically significant. Various other findings such as status of vaccination, IgM serology and gender were elaborated in percentages and frequencies.

Total 915 cases were investigated in which 572 were confirmed measles patients; 72 were vaccinated while 258 had been never vaccinated to avoid the disease. From suspected measles patients, 128 were vaccinated adequately. In both groups, status of vaccination was unknown in a quarter of subjects. A considerable relationship was observed between the status of vaccination and infection of measles with greater measles frequency in unvaccinated cases as compared to the vaccinated patients. Detailed outcomes analysis have been made in Table I and II.

RESULTS:

Table – I. Vaccination status among 9 months of age with confirmed and suspected measles (n= 915)

Vaccine Dose	Children with measles IgM positive		Children with measles IgM negative	
	Number	Percentage	Number	Percentage
Two doses	72	12.6	128	128
One dose	96	16.8	49	49
None	258	45.1	96	96
Status not known	146	25.5	70	70
Total	572	100	343	343

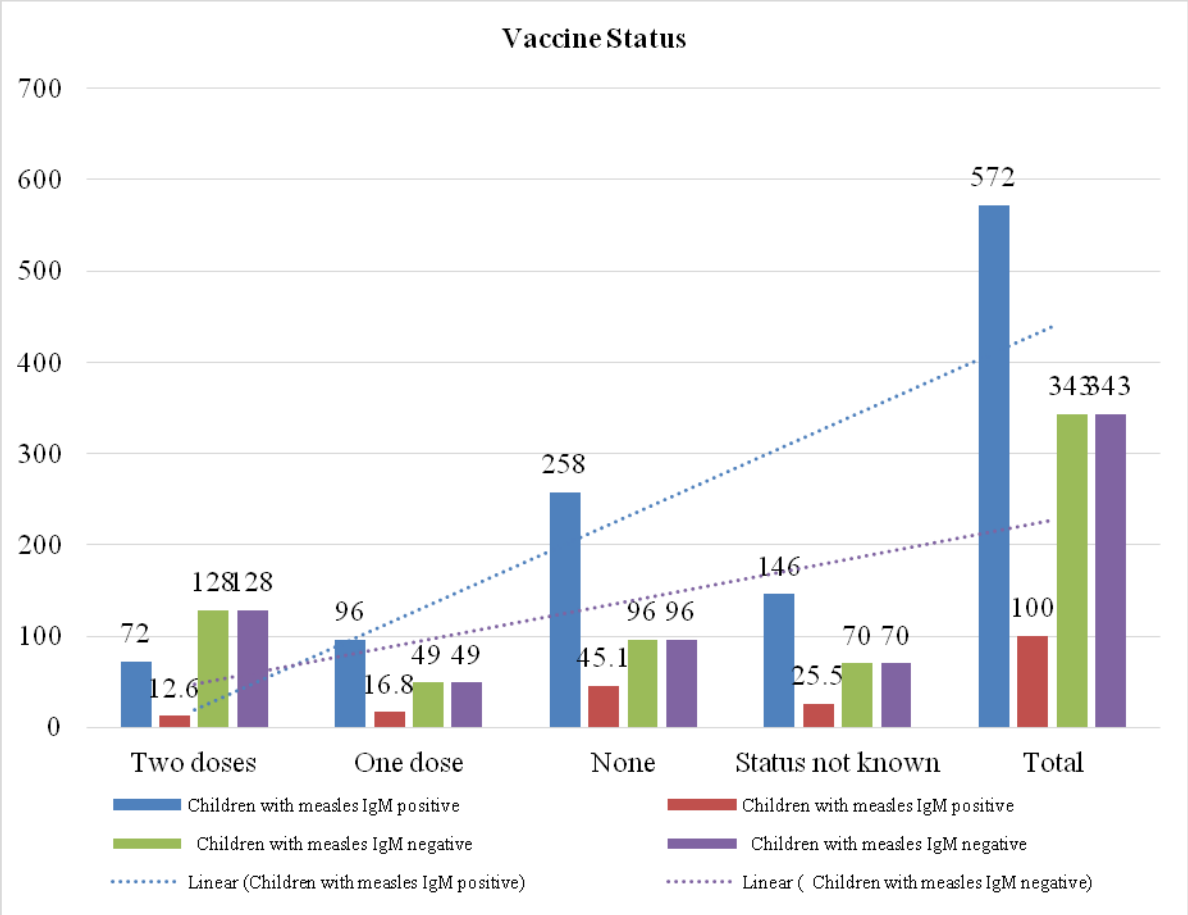
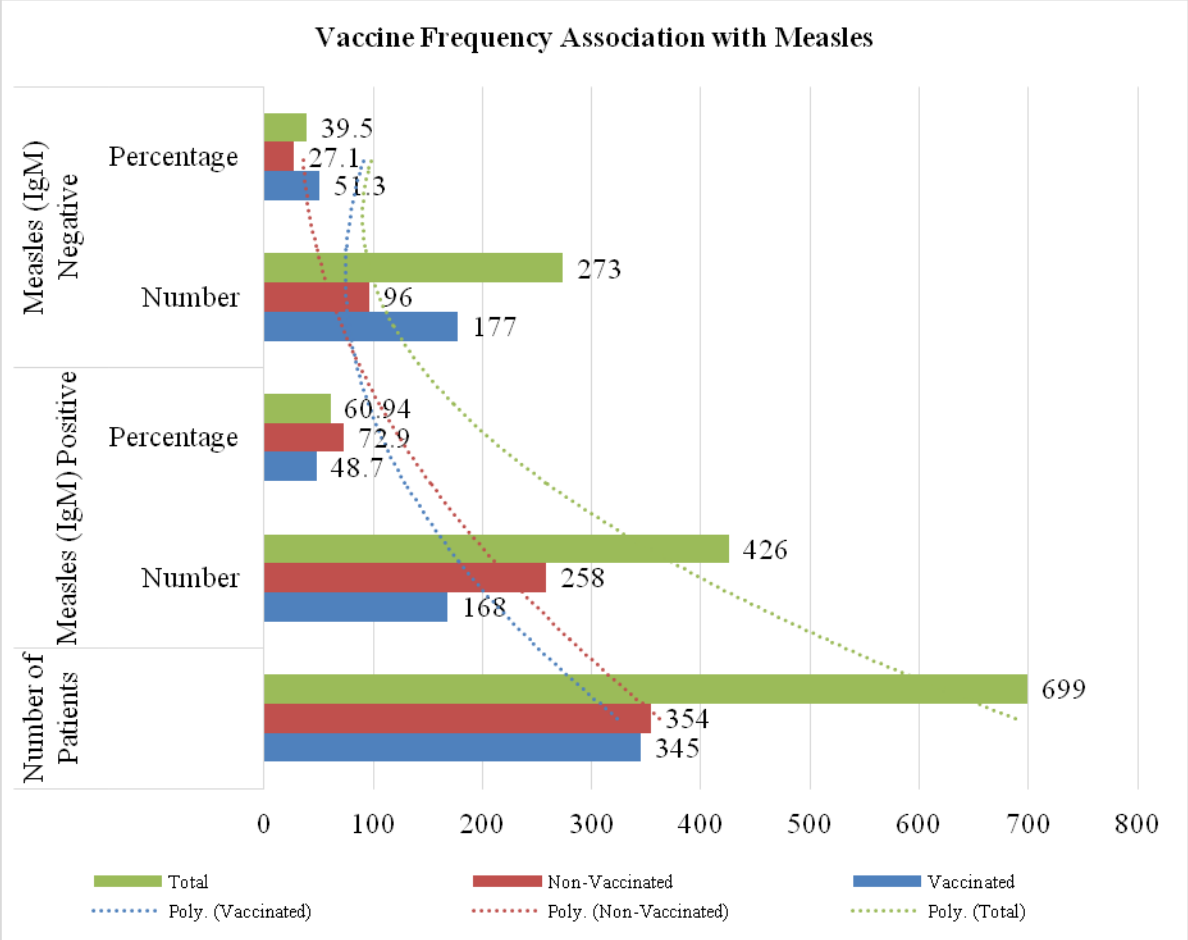


Table – II. Association of vaccination status with frequency of measles infection (n= 699)

Vaccination Status	Number of Patients	Measles (IgM) Positive		Measles (IgM) Negative		P-Value
		Number	Percentage	Number	Percentage	
Vaccinated	345	168	48.7	177	51.3	<0.001
Non-Vaccinated	354	258	72.9	96	27.1	
Total	699	426	60.94	273	39.5	



DISCUSSION:

In our study we can make an assessment about the status of immunisation in seventy six percent of all the cases registered at the outset against measles. This frequency can be contrasted with other developed nations in terms of its efficacy and betterment. In Canada the judgement about status of immunisation in measles cases was recorded as 70 percent whereas in Malaysia it was recorded 69 percent [13, 14]. This rate about immunisation status was reduced from 29 -43 percent in Mozambique and California [15]. Vaccination records highest availability was 95 percent which recorded from European Economic Area (EEA) and European Union (EU) nations [16].

In USA the situation is quite different where total 64 reported cases had only one vaccinated case. In Malaysia unvaccinated cases were 31.29 percent [14]. Protective role against the disease is suggested by measles vaccine after weighing upon the high frequency of unvaccinated measles cases. In order to establish positive correlation between the vaccination absences with greater frequency of measles infection, the comparison between measles frequency amongst those who had received either one or two doses of the vaccine with the measles frequency amongst unvaccinated cases was made. It was proved that decreased frequency of measles infection was associated with increasing number of doses. In our findings, 12.6 percent children who were vaccinated

properly against the disease were infected with measles. It is pertinent to note that in our study 30 percent of the cases were infected with measles despite having one dose of vaccine against the disease. It included a slightly more than 12 percent of the cases who were vaccinated with both doses of vaccine. The results that we acquired in the vaccinated population can be rightly compared to the reported range of frequency ranging between 9 to 30 percent in the countries such as Malaysia [14] California, EU/EEA [16] and Canada [13]. It also included 1.8 to15 percent of the cases that were completely inoculated against measles. Unvaccinated cases proportion amongst all age groups was higher [16]. During the outbreak of disease in 2009, two physicians in Virginia and Pennsylvania were reported to have infected with the disease albeit their complete vaccination [17]. This caused startling uncertainties about the validity and efficiency of the vaccine. Some studies conducted in developing countries have demonstrated the less formation of IgG antibodies in response to measles vaccination [18]. The positive thing that we received from those two infected doctors was the inability of the infection to spread thus indicating the lower chances of infectivity as compared to completely symptomatic cases [17]. Besides we pay heed towards cases of measles who were vaccinated, we should render our attention to something more serious and grave i.e. the children who keep on remaining unvaccinated. This answer may have relevance to EPI sphere encompassing demographic data accuracy in order to measure vaccine coverage and vaccination targets, quality assurance of surveillance system and information. Additionally, it might be influenced by political will, human resources, professional devotion of the concerned agencies and equipment. It is very unfortunate to narrate that the affected province, corrupt health centres are declared by Transparency International [19]. It is highly recommended on our part that a strategy must be formulated to ensure vaccine coverage more than 95 percent. To maintain the record of all the vaccinated children is another recommendation of ours. Immediate endeavours are required to find out the factors responsible for poor immunisation of children and maintenance of records. There is also a dire need to educate all the masses about the advantages of vaccine by means of all available resources such as electronic and print media, schools, mosques etc. We also recommend that more and more researches are to be carried out to determine various factors related to the disease infection.

CONCLUSION:

By summing up all the required data and information, it was concluded that rate of vaccination amongst non-measles patients was considerably greater than those of measles patients. 12.6 percent of the cases were infected with disease albeit their complete vaccination. The vaccination status in about quarter of the cases was unknown.

REFERENCES:

1. Jani JV, Jani IV, Araujo C, Sahay S, Barreto J, Bjune G. Assessment of routine surveillance data as a tool to investigate measles outbreaks in Mozambique. BMC Infect Dis 2006; 6:29. [DOI: 10.1186/1471-2334-6-29].
2. European Centre for Disease Prevention and Control. Measles and rubella monitoring – March 2013: Surveillance Report [Online]. Stockholm; 2013. Available from: http://ecdc.europa.eu/en/ publications/Publications/measles-rubella-monitoring- report-march-2013. Accessed on November 18, 2017.
3. Rota JS, Hickman CJ, Sowers SB, Rota PA, Mercader S, Bellini WJ. Two case studies of modified measles in vaccinated physicians exposed to primary measles cases: high risk of infection but low risk of transmission. J Infect Dis 2011;204: S559-63. [DOI: 10.1093/infdis/jir098].
4. Zahoor MA, Rasool M H, Waseem M, Aslam B, Zahoor MK, Saqalein M et al. Prevalence of measles in vaccinated and non-vaccinated children. EXCLI J 2015; 14:504-7. [DOI: 10.17179/ excli2015-170].
5. Khan T, Qazi J. Measles outbreaks in Pakistan: causes of the tragedy and future implications [Online]. Epidemiol Rep 2014; 2:1. Available from: http://www.hoajonline.com/epidemiolrep/2054-9911/2/1. Accessed on November 18, 2017.
6. WHO. Measles deaths decline, but elimination progress stalls in some regions. Improved vaccination rates critical for success [Online]. Geneva: World Health Organization; 2013. Available from: http://www.who.int/mediacentre/news/notes/2013/measles_20130117/en/. Accessed on November 18, 2017.
7. WHO. Reported measles cases and incidence rates by WHO Member States [Online]. Geneva: World Health Organization; 2012. Available from: http://www.who.int/immunization/monitoring_ surveillance/burden/vpd /surveillance_type/active/measles_monthlydata/en/. Accessed on November 18, 2017.

8. Niazi AK, Sadaf R. Measles epidemic in Pakistan: In search of solutions. Ann Med Health Sci Res 2014; 4:1-2. [DOI: 10.4103/2141-9248.126600].
9. Khan A, Ullah O, Ambreen, Ahmed I, Merajuddin. Measles in vaccinated children 1.5 to 3 years of age in rural community of district Peshawar, Pakistan. J Ayyub Med Coll Abbottabad 2015; 27:825-8
10. Rahman A, Saeed A, Ali M. Assessment of knowledge and practices of mothers regarding measles-2 immunization for children [Online]. Pak J Med Health Sci 2013; 7:719-21. Available from: http://www.pjmhsonline.com/2013/july_sep/pdf/719%20%. Accessed on November 18, 2017.
11. WHO. Response to measles outbreaks in measles mortality reduction settings [Online]. Geneva: WHO Press; 2009. Available from: http://www.who.int/immunization/documents/diseases/ measles_who_ivb_09_03/en/. Accessed on November 18, 2017.
12. Wasif S. Measles outbreak: The epidemic isn't near; it's already here [Online]. Express Tribune; 2013. Available from: https://tribune.com.pk/story/539790/measles-outbreak-the-epidemic-isntnear-its-already-here/. Accessed on November 18, 2017.
13. Lim GH, Deeks SL, Fediurek J, Gubbay J, Crowcroft NS. Documenting the elimination of measles, rubella and congenital rubella syndrome in Ontario: 2009-12 [Online]. CCDR; 2014. Available from: https://www.canada.ca/en/publichealth/services/reports-publications/canada-communicable- disease-report-ccdr/monthly-issue/ 2014-40/ccdr-volume-40-08-april-17. Accessed on November 18, 2017.
14. WHO. Country Profile-Measles Elimination: Malaysia [Online]. Geneva: WHO press; 2016. Available from: http://www.wpro.who.int/immunization/documentsmeasles_country_profile_may 2016_mys.pdf. Accessed on November 18, 2017.
15. Mason WH. Measles. In: Kliegman RM, Stanton BF, St Geme III JW, Schor NF, editors. Nelson Textbook of Paediatrics. 20th ed. Philadelphia: Elsevier Saunders; 2016. p. 1542-8.
16. Mehta P. The Measles Vaccine [Online]. Mehta Childcare; 2016. Available from: http://www.mehtachildcare.com/vaccines/measles vaccine.htm. Accessed on November 18, 2017.
17. Rahim F, Habib-ur-Rehman and Afridi JM. Measles- Demographic profile and complications in children [Online]. J Med Sci 2011; 19:174-6. Available from: http://www.jmedsci.com/admin/ uploadpic/JMS-5-oct2011.pdf. Accessed on November 18, 2017.
18. WHO. Measles [Online]. Geneva: World Health Organization; 2016. Available from: http://who.int/mediacentre/factsheets/fs286/en/. Accessed on November 18, 2017.
19. Beach R, Thalange N. Infectious disease and immunity. In: Thalange N, Beach R, Booth D, Jackson L, editors. Essentials of Paediatrics. 2nd ed. Philadelphia: Elsevier Saunders; 2013.p. 231-46.