

VACCINATION STATUS AND CAUSES OF UNDER VACCINATION IN PAEDIATRIC PATIENTS ADMITTED AT KHYBER TEACHING HOSPITAL PESHAWAR

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ABSTRACT

To assess the vaccination status of the admitted pediatric population in Khyber Teaching hospital Peshawar and to compare the findings in the data collected during June 2006 and February 2010. A hospital based survey was conducted in the pediatric population admitted in the department of Pediatrics KTH Peshawar, in June, 2006 and February, 2010. Those children whose parents gave consent for the collection of data based on a questionnaire were included in the study. Data was collected from parents of 81 children on both the occasions. We found that 40% of patients had up-to-date vaccination profile in 2006 while it was 33% for 2010 (*p*-value 0.54). Twenty-seven (33.3%) children had no history of vaccination in 2006, while thirty-seven (45.6%) children were not vaccinated in 2010 (*p*-value 0.30). In 2006 the underlying causes of no vaccination were lack of awareness (74%) and peer pressure (11%) while in 2010; internal displacement of the patients which precluded vaccination (43%) and lack of awareness (32%) were the main causes. There was no statistical difference between lack of awareness amongst parents of patients in 2006 and 2010 (*p*-value 0.08). Awareness for polio and participation in supplementary vaccination activities for polio was high in 2006 (97%) and in 2010 (87%). A low rate of vaccination was found in children during both time-periods. Lack of awareness regarding the standard EPI schedule was the main factor in 2006 while internal displacement of the patients was the main underlying cause of under-vaccination in 2010.

Key Words: Immunization, Poliomyelitis, Prevention, Infectious diseases, Knowledge.

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INTRODUCTION

The main dogma behind vaccination is to immunize a person against an infectious disease. Immunization controls and eliminates life-threatening infectious diseases. It prevents an estimated 2-3 million children deaths every year in all age groups, which makes it one of the most successful and cost-effective public health intervention¹. The Expanded Program on Immunization (EPI) was initiated in 1974 by WHO and UNICEF but it was launched in Pakistan in 1978 to protect children by immunizing them against Tuberculosis, Polio, Dip-

theria, Tetanus, Pertussis and Measles. Hemophilus and Hepatitis B were included in the EPI program in 2009². EPI in Pakistan targets about 5.8 million children below 1-year of age to protect them against 8 vaccine-preventable diseases, in addition about 5.9 million pregnant women to prevent them and their children from tetanus³.

Pakistan is a developing country with very high Infant Mortality Rates (IMR), major cause being infectious diseases⁴. A study conducted in Pakistan showed that 2 out of top 3 causes of infant mortality were due to vaccine-preventable diseases⁵. Pakistan's EPI indicators have failed to meet the expected targets³, especially in comparison with other regional countries^{3,6}. For instance, Pakistan is among one of the three countries around the globe which are yet to interrupt the wild type transmission of the Poliomyelitis virus. Even India, a neighboring country has successfully eradicated the virus^{6,7}.

Several studies are available in which prevalence rates of vaccination have been investigated in various cities of Pakistan^{8,9}. Many authors have reported various barriers standing in the way of successful

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vaccination, which are different in different regions and different time periods^{10,11}. Although in our case, convenient sampling of the hospital data was used. However, before the launch of full-fledge research on a massive scale in which adequate representation from every part of the province would be taken, the need of such pilot studies is vital and their importance cannot be denied as they serve to indicate whether such a large-scale research needs to be conducted or not.

The aims of this study were to investigate the immunization status of children admitted in Pediatrics Unit in a tertiary care hospital, to identify the causes of under vaccination in children, assess the knowledge of parents regarding schedule of vaccination and then to compare the above finding in two time periods (2006 and 2010). The two time frames were chosen so as to look for any difference in the causes of under-immunization, whether there has been any development in the vaccination status due to the increasing stress on the EPI schedule and finally to sum up, the final aim was to decide whether a large scale study needs to be conducted to analyze the vaccination statistics of the pediatrics population in the province of Khyber Pukhtunkhwa.

METHODOLOGY

A cross-sectional study was performed in two phases; first phase was from 19th June to 30th June, 2006 and second phase was from 1st February to 12th February, 2010. The study was performed in Pediatrics Unit of KTH Peshawar, which is a 1200-bedded tertiary care hospital in Peshawar and is affiliated with Khyber Medical College, Peshawar. The hospital receives patients from all over the Khyber Pukhtunkhwa province. The study was approved by the hospitals' Institute Review and Ethics Board (IREB).

A total of 162 pediatric patients were included in the study. There were 81 patients on both occasions. The inclusion criteria were all parents who gave informed consent for the study and were admitted during the study time period.

The authors developed a researcher-administered questionnaire in Urdu language (the national language of Pakistan). The questionnaire was designed incorporating important parameters after extensive literature search of PubMed database. The format of majority of the variables was categorical with a yes or no format. There were few open ended questions. The 9-itemed questionnaire collected data on gender, age, address, current immunization status, causes of non/under immunization polio drops administered, knowledge of parents regarding schedule of vaccination and vaccination status of siblings of patient.

The questionnaires were filled by researchers

themselves after getting an oral consent from parents of the patients. Questions were asked from parents and then double checked with vaccination card (if available) and physical examination (for BCG scar) was performed. Vaccination status was considered up-to-date if the vaccination had been administered regularly according to the EPI schedule. If under-not vaccinated, the reason of doing so was noted down. Awareness was based on patients knowledge of EPI schedule, if the parents of the patients could identify approximately the right time periods at which vaccination is administered to a child, they were considered as having reasonable knowledge regarding the EPI schedule and were categorized as "know the schedule" while those who could not identify the approximate time periods or had no know-how regarding vaccination fell into the non-aware category. While a third category was based on those who replied they had vaccinated their child according to the dates mentioned in the vaccination card. Only those patients were included in this category whose parents insisted on that they had followed the dates on the card rigorously till the completion of dates on vaccination card or those who could show the vaccination card.

Data was entered on Microsoft Excel Worksheet. Data was analyzed using Statistical Package for Social Sciences 14.0 (SPSS, Inc., Chicago, IL, USA). *Fisher's Exact Test* was applied to test the association. Results were recorded as frequencies and p-values. For all purposes, a p-value of <0.05 (95% confidence level) was considered as the criterion of significance.

RESULTS

A total of 162 patients were included in the study (81 each in both phases). There were 42 male (51.8%) and 39 female (48.2%) patients in 2006 while 46 male (56.7%) and 35 female patients (43.3%) in 2010.

The immunization status of patients is given in Figure 1.

There was no statistically significant difference in vaccination status of patients in both time periods, although more number of children was vaccinated in 2006. The odds ratio was found to be 1.72??.

Amongst the 64 patients (35%) who were not vaccinated, the parents' were asked to identify the main reason for not immunizing their child. The main reasons are shown and compared in Table 1.

The only significant difference was in 'Internal Displacement', which was more prevalent in 2010 compared with 2006. The most common reason for non-immunization was found to be lack of awareness.

Figure 1: Immunization status in 2006 and 2010

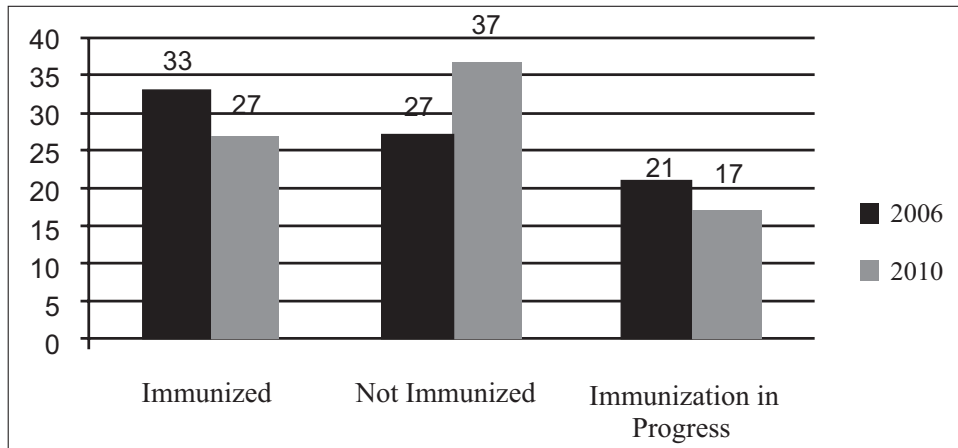


Figure 2: Demographic distribution of non-immunized patients in 2006 and 2010

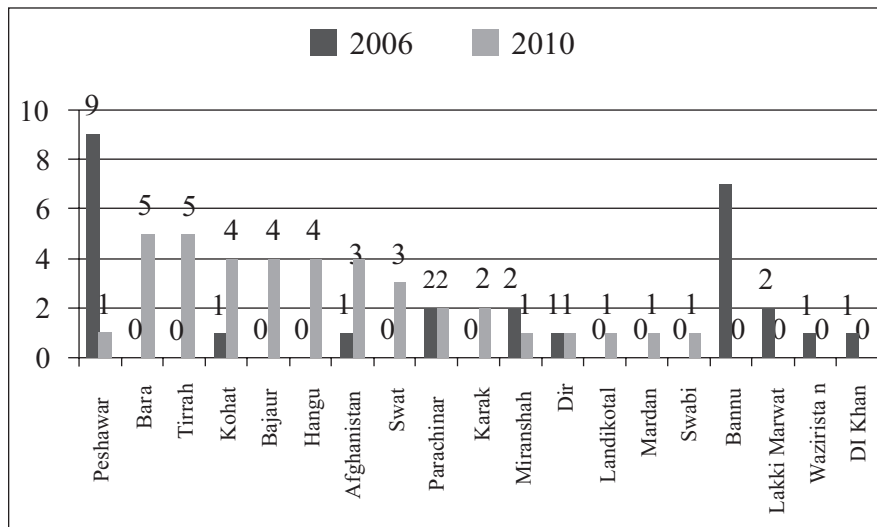


Table 1: Reasons for non-vaccination in 2006 and 2010

	2006	2010	%age	p-Value
Lack of awareness	20	12	50%	0.08
Peer pressure	3	0	4.8%	0.08
Unwell condition	2	6	12.5%	0.46
Did not consider it important	1	3	6.2%	1
Not present in area	1	0	1.5%	0.43
Internal displacement	0	16	25%	0.0008

Table 2: Knowledge of parents' regarding vaccination schedule in 2006 and 2010

	2006	2010
No Knowledge	26 (32%)	28 (35%)
Know the schedule	18 (22%)	20 (24%)
According to Card	37 (46%)	33 (41%)

The demographic distribution of patients in 2006 and 2010 is given in Figure 2.

It can be very well appreciated that in 2006, the non-immunized patients were mostly from main city or sub-urban areas of Peshawar and Bannu while in 2010, the non-immunized patients were from the tribal areas or areas where there was ongoing conflict.

The parents were asked regarding participation in polio campaigns that are held regularly. In 2006, 79 patients (97.5%) received polio drops while 71 patients (87.6%) in 2010 received polio drops. The two patients who did not receive polio drops in 2006 were both from Afghanistan.

There was no significant difference (p -value = 0.81) in terms of knowledge regarding vaccination schedule as majority of parents immunized according to card.

DISCUSSION

Our research pointed out an alarmingly high rate of under/non vaccination in the admitted pediatric population in KTH Peshawar and no improvement on vaccination profile in the selected population was seen even after 4 years interval.

The immunization coverage of fully immunized admitted children in this study was 37.03% {41% (2006) and 33% (2010)}. The partial/non-immunized children accounted for 59% (2006) and 67% (2010) with a mean of 62.9%. The results are consistent with other similar studies that have been performed previously^{8, 9}. A hospital based study conducted in a different hospital in same city, reported 37.6% children to be completely immunized and 62.4% to be partial/non-immunized⁸. In another study⁹ on 2000 children in Karachi, the reported percentage of population vaccinated was 26.5% at 2 years of age. They also reported a relative risk of 2.2 for complete immunization in children delivered at hospital compared with delivery at home and a relative risk of 1.4 for vaccination with a higher educational level of mother.⁹

Majority of data regarding immunization status is based on studies conducted in hospitals. Ahmad et al¹², conducted a community survey in North West Frontier Province (currently, Khyber Pukhtunkhwa) and showed that 65% children were fully immunized. There was a discrepancy that only half of them were verified by immunization.

There is a difference in the findings of the studies conducted in related to the EPI program itself in Pakistan¹³⁻¹⁵. Pakistan Demographic and Health Survey reported immunization coverage of different provinces of Pakistan¹³. Punjab had the highest immunization coverage of 53%, followed by NWFP

(KPK) of 47%; Sindh had 37% while Balochistan was last in list with 35%. Few studies have cited improved immunization coverage, as high as 89% in Pakistan^{14,15}.

In this study, though we did not look for individual vaccines except polio. Polio vaccination in oral polio campaigns, on national immunization days and routine vaccination coverage, taking all into account, the percentage of the sample population vaccinated against polio was 97.5% (2006) and 87.5% (2010) with a mean of 93%. In a study conducted in Hyderabad, Pakistan, Shaikh et al¹⁶ reported the vaccinations for different vaccines (100% polio, 71.6% BCG, 64.8% DPT and 40.8% measles). Amongst all EPI vaccines, polio has the highest rate of immunization and it has been reported in many studies. Iram et al¹⁷ reported 99% immunization against polio in a study conducted on 50 children visiting outpatient department in a tertiary care hospital in Punjab province of Pakistan. The increased coverage for polio can be attributed to media campaigns, regular polio campaigns and polio workers going door-to-door to provide vaccines¹⁸.

In this study, the main reasons cited by parents for non-immunization were lack of awareness regarding benefits of immunization, Conflicts in their resident localities leading to internal displacement which precluded access to vaccination centre, unwell condition of child, not considering immunization as important, services not present in area and yielding to peer pressure and not immunizing their child. All these barriers except conflicts in their resident localities leading to internal displacement have been cited previously by other studies. In addition to these, parents literacy¹⁹, malnourished child¹⁶, family income²⁰, rural area¹⁸, place of delivery⁹, age of parents²¹ have been reported as other causes of non/under immunization.

Majority of parents did not know the schedule of vaccination. The most common response amongst parents of immunized children was according to immunization card. The use of immunization card is associated with improved immunization coverage²¹. Very few parents knew about the names of various diseases against which immunization is done. All parents were able to recall name of Polio and the polio drops which shows effectiveness of media and polio campaigns. Other studies have also shown low level of knowledge regarding names of diseases¹⁷.

The most important reason contributing towards under-non vaccination in our study in 2010 was the re-emergence of conflicts in various resident localities leading to internal displacement of the patients. This has affected the vaccination in many regions of Khyber Pukhtunkhwa. This has precluded the access of the patients to the vaccination/ hospital centres.

In such a scenario the EPI teams cannot also launch a door to door campaign.

This study was aimed as a pilot study to identify the need for any large-scale study on the vaccination statistics that may be done on a grass-root level. The paediatric population of the admitted patients in KTH Peshawar was a selected convenient sample of the population belonging to the different parts of the Khyber Pukhtunkhwa province. Even if the Berksonian bias is taken into consideration, the alarmingly high rates of non-vaccination as indicated in our study would set off the impact of such a bias so that if a mega-study is performed at a grass-root level in the province, there is a high likelihood of getting similar results. Furthermore, such a large scale study would more clearly quantify and hence shed light on the causes of non-vaccination and how to circumvent them.

There were a number of limitations in this study. A slightly loose criterion was used to analyse the awareness of the patients in which if they could identify the approximate dates of vaccination in the EPI schedule, they were considered to be aware. There was no correlation with the presenting complaint of the child. The vaccination coverage was not correlated with either place of delivery or the educational level of mother. There were no questions in the questionnaire regarding individual vaccines as the common population does not have any know-how of the individual vaccine names, including it in the study would have been worthless. Seasonal variations were there, as first phase was conducted in summer month of June while second was in winter month of February. The study also included patients from Afghanistan where there are at present no such EPI program and immunization services which lead to slight changes in results of this study.

CONCLUSION

Based on this study we recommend, institution of various methods to raise the awareness level regarding vaccination. The awareness campaign specifically needs to focus on the issues of peer pressure, the importance of vaccination and raising the knowledge level regarding vaccination in the common man. Actions need to be taken by the government agencies to provide vaccination campaigns targeted towards internally displaced population of the country. A campaign needs to be launched on massive level to dispel the misconceptions regarding vaccination as many of the families believe as indicated in our study that vaccination should not be given to a child while the baby is ill.

Finally this pilot study concludes that there is a definite need of a large scale study having adequate representation from the different parts of the

province of Khyber Pukhtunkhwa focusing on vaccination statistics, the reasons of under-immunization and methods that should be employed to raise the vaccination coverage in the population of Khyber Pukhtunkhwa.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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CONTRIBUTORS

FS conceived and designed the study. FS and HG collected and analyzed the data. FS and HH interpreted the data and wrote the manuscript. All authors have approved the final manuscript that was submitted to the journal.