STATUS OF IMMUNIZATION IN YOUNG CHILDREN

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ABSTRACT

Objectives: To determine the immunization status of young children coming to a tertiary care hospital from various districts of KPK and FATA.

Material and Methods: This observational, cross sectional study was conducted in Department of Child Health Khyber Teaching Hospital Peshawar, from March 2011 to September 2014. Relevant information was noted on a questionnaire prepared in accordance to aims and objectives of the study.

Results: A total 432, parents of children having ages 1-5 years visiting Khyber Teaching Hospital, Peshawar were interviewed. 276 (63.8%) were male, whereas 156 (36.1%) were female. Majority of the study population (86.3%) was belonging to rural areas. Out of 432 children, only 205 (47.4%) were fully vaccinated, 107(24.8%) partially vaccinated, 120 (27.8%) were non-vaccinated, whereas 227 (52.6%) children were under vaccinated (non-vaccinated + partially vaccinated). Among 276 male patients, 127 (46.01%) and among 156 female patients 78(50%) were fully vaccinated, 79 male (28.6%) and 41 female (26.7%) were non-vaccinated, whereas 70 male (25.3%) and 37 female (23.7%) were partially vaccinated and 149 (53.9%) male and 78 female (50%) were under vaccinated. Out of 59 children from urban areas, 36 (61.01%), out of 373 children from rural area 169 (45.3%) were fully vaccinated; 9(15.2%) from urban and 111 (29.7%) from rural areas were non-vaccinated; 14 (23.7%) from urban and 93 (24.93%) from rural areas were partially vaccinated; whereas 23 (38.98%) from urban and 204 (54.69%) from rural areas were under vaccinated.

Conclusion: Immunization coverage is low in children of Khyber Pakhtunkhwa and FATA. The proportion of immunized children in rural areas of KPK and FATA is lower as compared to urban areas.

Key Words: Immunization, measles, children, tertiary care, Khyber Pakhtunkhwa.

INTRODUCTION

Paediatric vaccination is considered to be one of the most important health measures for healthy childhood population. Vaccination protects children from major infectious diseases; it prevents millions of deaths, morbidities and disabilities in children throughout the world, and is therefore considered essential by pediatricians and other health professionals.[1] Paediatric immunization is one of the most effective means of combating lethal infectious diseases in children.[2]

In 1974 World Health Organization(WHO) initiated the Expanded Program of Immunization(EPI) to make vaccines available to all children for the purpose of controlling six pediatric infectious diseases; tuberculosis, polio, diphtheria, tetanus, pertussis, and measles.[3] Pakistan initiated its EPI program in 1978 with support, guidance and recommendations of WHO.[4] The main objectives of initiating EPI program were to eradicate polio by 2012, to eliminate measles and neonatal tetanus by 2015 and decreasing the incidence of other vaccine preventable diseases.[5] Later on in 2002 vaccines against hepatitis B, in 2008 vaccine against haemophilus influenza type B, and in 2012 pneumococcal vaccine were also added with support from the government and development partners.[5]

Pediatric vaccination has led to a significant reduction in morbidity and mortality from dangerous infectious diseases worldwide and subsequently lowering the infant mortality rate.[7] However, in 2012 the World Health Organization notified that around 1.5 million children worldwide died from vaccine-preventable disease. During the same period WHO further reported about 22.6 million children under the age of 1 year worldwide did not receive diphtheria-Pertussis-tetanus vaccine three (DTP3) and more than 70% of this pediatric population lived in ten countries of Pakistan, Ethiopia, the Democratic Republic of Congo, India, Iraq, Indonesia, Nigeria, Uganda Philippines and South Africa.[8]

In Pakistan, the health department provides the vaccination schedule for the national EPI program in accordance with the guidelines WHO. The EPI is supported and funded by the United Nations International Children's Funds (UNICEF) and GAVI. In Pakistan free vaccines are provided in every district across the coun-

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try. In spite of a National Immunization program and frequent anti-polio Campaigns Pakistan is still one of the few countries where polio could not be eradicated.[6] The WHO notified that in Pakistan there were 198 confirmed polio cases in 2011[7], 58 in 2012 and 93 cases were reported in 2013.[8] Whereas in 2014 and 2015, 306 and 38 cases respectively have been reported.[9] In the past couple of years Pakistan has also been facing a rise in measles cases. In 2011, 64 children died, and in 2012 the number increased to 306, of whom majority was from Sindh province.[9] 192 deaths were reported in 2013 from Punjab province of Pakistan[10]. Due to cultural, economic factors and security reasons Pakistan has lower vaccination status than other countries in the region[6].

The benefits of getting a child immunized are much evident, yet studies have shown that in many developing countries, some of the parents, usually belonging socio-economically disadvantaged populations, refuse child vaccination[11]. According to the 2010 report of Pakistan Institute of Legislative Development and Transparency (PILDAT), about 15% of deaths below the age of 5 years makeup 5% of overall mortality in Pakistan reflecting children as the most neglected part of society[10].

In KPK and FATA immunization rate is more compromised as compared to Punjab which is socio-economically more developed[11]. Although there has been a big improvement in immunization coverage by EPI in Pakistan in recent years, prompt measures are still needed to achieve the desired goals. The proportion of Pakistani children (age 12-23 months) who are completely immunized is only 47%, and 6% of children are non-vaccinated.[10] Complete vaccination coverage from province to province also shows marked variations, being 53% in Punjab, and 47% in Khyber Pakhtunkhwa, 37% in Sindh and 35% in Baluchistan[11]. In 2007 Routine EPI coverage was; BCG-89%, Polio-83%, DPT-83%, Hepatitis B-87%, Tetanus Toxoid-46%. These figures showed improvement in 2012 to 95%, 89%, 89%, 89% and 68% respectively[12].

Due to security situation in the region complete community based survey at movement was difficult to be performed in FATA and KPK. To our knowledge there is limited data regarding immunization status in these areas. Our study aims to determine immunization status of children coming from various district of FATA and KPK to Khyber Teaching Hospital, Peshawar. Our study up to some extent reflects the immunization study of KPK and FATA.

MATERIAL AND METHODS

This was an observational, cross sectional study through a questionnaire conducted from March 2011 to September 2014 at inpatient and outpatient setting Pediatric Department, Khyber Teaching Hospital, Peshawar, which is one of the largest public sectors, tertiary care hospital in Peshawar City. This hospital provides subsidized health care to Pediatric patients, majority of home belong to poor community with low socio-economic class and many of them come from far-flung areas of KPK and FATA. We attempted to interview all the parents coming with children aged 1 to 5 years. Thus, convenience sampling was employed. Those patients who were not accompanied by either of their parents were excluded from the study. Those having age below 1 year and above 5 years and those whose parents have not given consent were also excluded from the study.

The parents were approached at bed side in ward and in outpatient clinics and interviewed after taking informed consent. The vaccination status of the accompanying child was determined first by asking about the vaccination card. If vaccination card was not brought, then parents were inquired by asking relevant questions. For example has your child received first vaccine at birth? If yes then next to ask on which part of the body? If answer would be, on arm, next action would be to see for BCG scar. Next question was to ask about polio drops at birth. Similar questions were asked about timing and sites of other courses of EPI vaccines.

The Ethical Review committee of Khyber Medical College approved the study. Confidentiality of the data was maintained throughout the study. The study protocol was designed according to the guidelines laid down by the Helsinki Declaration. Fully Vaccinated: Children who had got full course of vaccination including a BCG vaccine, 3 doses of Pentavalent vaccine and at least 3 doses Oral Polio vaccine one dose of Measles vaccine according to WHO/EPI (see Table 1). Previous published studies have defined complete vaccination in a similar way.[14]

It is to be noted that injectable polio vaccine (IPV) has recently been started in some districts of KPK and was not included in our study. Non-Vaccinated: Children who had never been vaccinated. Partially Vaccinated: Children who had been immunized at least once, but had failed to complete the vaccination course according to their age as per EPI schedule. Under Vaccinated: Children who had either not been vaccinated (Non-Vaccinated) or had failed to complete the course of vaccination (Partially Vaccinated) according to their age as per EPI schedule.

RESULTS

A total of 432 parents of children having ages 1-5 years visiting our tertiary care hospital were interviewed. 276 (63.8%) patients were male, whereas 156 (36.1%) were female. Majority of the study population, 373

Table 1: New immunization schedule

Disease	Vaccine	Doses	Age of administration
Childhood TB	BCG	1	Soon after birth
Polio Myelitis	OPV	4	OPV0: Soon after Birth OPV1: 6 wks OPV2: 10 wks OPV3: 14 wks
Diphtheria	Pentavalent Vaccine	3	
Tetanus	(DTP + Hep B + Hib)		Penta1: 6 wks Penta2: 10 wks Penta3: 14 wks
Pertussis			
Hepatitis B			
Hib pneumonia and meningitis			
Pneumonia and meningitis due to S. pneumonia	Pneumococcal conjugate vaccine (PCV10)	3	Pneumo1: 6 wks Pneumo2: 10 wks Pneumo3: 14 wks
Measles	Measles	2	Measles1: 09 months Measles2: 15 months

Table 2: Vaccination vs. Gender (n=432)

Vaccination	Gender		Chi.Sq	P.Value
	Male	Female		
Vaccinated	127	78	0.63	0.425
Non-Vaccinated	79	41	0.27	0.601
Partially-Vaccinated	70	37	0.14	0.703
Total	276	156		

(86.3%) was belonging rural areas while 59 (13.6%) were belonging to urban areas. Age wise study population was classified in four groups on yearly basis. Most of children were belonging to the age group 12-24 months i.e.225 (52.1%) followed by children 25-36 months i.e. 92 (21.3%).

Out of 432 children 312 (72.2%) were ever vaccinated (fully vaccinated plus partially vaccinated); only 205 (47.4%) were fully vaccinated, 107 (24.8%) partially vaccinated, 120 (27.8%) were non-vaccinated, whereas 227 (52.6%) children were under vaccinated (non-vaccinated plus partially vaccinated). Vaccination status and gender is given in Table 2. More children in urban areas were fully vaccinated as compare to rural areas (61% VS 45.3% with p value 0.024). Out of 59 children from urban areas, 36 (61.01), out of 373 children from rural areas 169 (45.3%) were fully vaccinated; 9 (15.2%) from urban and 111 (29.7%) from rural areas were non-vaccinated; 14 (23.7%) from urban and 93 (24.93%) from rural areas were partially vaccinated; whereas 23 (38.98%) from urban and 204 (54.69%) from rural areas were under vaccinated.

Among vaccinated children maximum number were vaccinated in age group 12-24 months i.e. 111 (54.1%) followed by age group 25-36 months (20.5%) During this study measles vaccination status was also determined. Out of 432 children 200 46.2%) were vaccinated against measles and out of these patients only 2 patients got second dose of measles vaccine at 15-18 months of age. 232 (53.8%) children had never received measles vaccine.

DISCUSSION

Paediatric non-vaccination or incomplete vaccination is one of the major child health problems in Pakistan. Due to security reasons community based study was difficult to be performed in certain areas of Khyber Pakhtunkhwa (KPK) and FATA during the study period. Therefore to select a place where majority of these children and their parents can be entertained we chose a tertiary care hospital where many of children and their parents are coming from these far flung rural areas as well as children from urban areas, and the study population to some extent represents these areas.

In our study complete immunization cover was low in various areas of KPK and FATA. This is consistent with previous studies on immunization coverage in the country but unlike those studies proportion of non-vaccinated children is high in our study (27.8% vs. 6%). Vaccination coverage in these areas was low as compared to Punjab (53%) but was better than that in Sindh (37%) and Balochistan (35%).[14] This may be due to high literacy rate, development and easy accessibility of health facilities in Punjab as compared to these areas. Security situation in study areas, decrease awareness about routine immunization, inadequate outreach,

and decrease availability of vaccines in far flung areas, poverty, lack of time due to busy schedule and religious taboos may also be responsible for low immunization uptake. As reflected by some studies, awareness and uptake of vaccination can be increased through health education and evidence based discussion with parents.[15] Immunization awareness can also be increased through electronic and print media, through religious scholars and finally by improving basic health facility to community by the government.

In developed countries like America vaccination coverage even in rural areas is higher (80%) than developing countries like Pakistan.[16] In some cultural societies, including Pakistan, a male baby is more preferred than a female baby because males are considered to have social and economic utility in families.[17,18] However our study did not find statistically significant difference between male and female vaccination status. This was consistent with other studies which also found no association of child vaccination with either gender.[19,20]

In Pakistan and especially in KPK and FATA most of the population is living in rural areas (67.5%, 83.1% and 97.3% respectively).[21] Our study population also includes majority of children belonging to rural areas of KPK and FATA (86.3%). According to our study more children in urban areas are fully vaccinated as compared to rural areas (61.01% vs. 45.3%, with p value 0.024). This is in accordance with previous studies on immunization coverage in Pakistan.[22] It is also consistent with another study on immunization status of children from urban and rural areas of Peshawar (76.5% vs. 48.8% respectively) reflecting inequity in childhood immunization between urban and rural areas.[23] Better vaccination coverage in urban areas may be due increase proportion of educated population, increase number of health facilities including private sector hospitals, easy accessibility of vaccination centers.

In this study measles vaccination status was 46.2% while the proportion of children ever vaccinated (complete plus partial) was 72.2%. Thus there was a large droplet of 26.0% between the initial vaccination and measles vaccine uptake. This is consistent with vaccination status determined in previous studies (85% vs. 61%).[24] Although less than in developed world yet full vaccination coverage in Pakistan has been gradually improving over the past two decades, with an increase from 35% in 1990-91 to 54% in 2012.[25]

CONCLUSION

Immunization coverage is low in children of Khyber Pakhtunkhwa and FATA. The proportion of immunized children in rural areas of KPK and FATA is lower as compared to urban areas. Measles vaccine uptake is lower as compared to number of children at the start of vaccination.

RECOMMENDATIONS

Prompt efforts are needed to strengthen routine immunization by improving outreach, ensuring timely availability of all EPI vaccines especially to far flung rural areas. To increase awareness about routine immunization through health education in health facilities, antenatal clinics, schools, colleges, through religious scholars, and through electronic and print media, last but not the least to improve literacy rate.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Khan S: Concept, design, data compilation, analysis, interpretation and discussion.

Muhammad Z: Helped in searching and provision of references.

Ahmad I: Helped in statistical analysis and correction.

Gundapur AJ: Critical revision and final corrections.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.