ASSESSMENT OF THE IMMUNIZATION STATUS OF CHILDREN BETWEEN 1-3 YEARS OF AGE, COMING TO OPD OF MILITARY HOSPITAL, RAWALPINDI

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ABSTRACT

Objective: To determine the immunization status of children between 1-3 years of age, reported at children OPD; Military Hospital, Rawalpindi.

Study Design: Descriptive cross sectional study.

Place and Duration of Study: Paediatric outpatients department of Military Hospital, Rawalpindi from January to June 2010.

Material and Methods: Vaccination data of 2200 children of 1-3 years of age coming to outpatients department, regarding seven EPI target diseases was collected using a standard proforma. Statistical analysis was done at the end of study using SPSS version 14.0.

Results: Out of 2200 children, 1256 (57.1%) were completely immunized, 740 (33.6%) were partially immunized and 204 (9.3%) were unimmunized.

Conclusions: This study concludes that immunization indicators have not met the expected benchmarks and achievements are inadequate as compared to the regional and global immunization level.

Keywords: EPI coverage, Immunization, Vaccination.

INTRODUCTION

Communicable disease control is a vital part of pediatric medicine and such control requires an intact and active public health care system, optimal nutrition, use of specific methods to prevent transmission of infections and universal immunization[1,2]. Immunization is one of the most beneficial and cost-effective disease prevention measures[1]. As a result of effective and safe vaccines, smallpox has been eradicated, polio is close to worldwide eradication, and measles and rubella are no longer endemic in many parts of the world[2]. Expanded program on immunization (EPI) was launched in 1976 by WHO and UNICEF with the aim of controlling six childhood diseases: tuberculosis, diphtheria, pertussis (whooping cough), tetanus, polio and measles[3].

Vaccines are used worldwide, though, the types of vaccines, indications, contraindications and immunization schedules vary substantially[4]. Most developing countries including Pakistan follow a schedule promulgated by the World Health Organization's EPI[2,5]. According to this schedule, all children should be vaccinated at birth against tuberculosis with Bacille Calmette-Guérin (BCG) vaccine. Many children also receive a dose of the live attenuated oral polio vaccine (OPV) at this time. Immunization visits are scheduled for 6, 10, and 14 wks of age when DTP vaccine and OPV are administered. Measles vaccine is given at 9 month of age. Many developing countries have implemented hepatitis B vaccination[2,5].

In Pakistan, EPI was launched in 1978[6]. Initially started with 6 antigens, the programme included 2 new antigens, hepatitis B and *Haemophilus influenzae* type b (Hib), during the last decade. Over 30 million children are targeted for every round of polio supplemental immunization activities. The expanded programme on Immunization (EPI) in Pakistan annually targets around 5.8 million children aged below 1 year to protect against 8 vaccine-preventable diseases and 5.9 million pregnant

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women to protect them and their newborns from tetanus through routine immunization services. The overall objective of EPI is to reduce mortality and morbidity resulting from the 8 EPI target diseases[7].

Immunization coverage in South Asia has increased from about five % in the 1970s to nearly 50 % at present but still half of the children remain un-immunized[3,5]. Immunization coverage of children under 5 years in Pakistan ranges from 37% to 65% as shown by studies from various areas[5,8].

This study was planned to determine the age appropriate EPI coverage of children between 1-3 years which will provide data to the health care providers to take appropriate steps that would improve immunization coverage of children in our area. In addition it will provide a chance to administer or repeat missing doses to partially immunized or non-immunized children.

MATERIAL AND METHODS

This descriptive cross sectional study was conducted at paediatric outpatients department of Military Hospital Rawalpindi and was completed in six months. It was started after the approval from ethical committee of the hospital. Informed consent was obtained from the parents of the children. It was a sample size based study. Sample size was calculated by WHO sample size calculator, using 95% confidence level, prevalence 35% and absolute precision required 2%. Sample size (2200 cases) was completed in six months. All the children of both genders between 1-3 years of age, coming to OPD of Military Hospital Rawalpindi were included in the study while all the children less than one year of age, more than 3 years of age, diagnosed cases of immunodeficiency, the children vaccinated outside Pakistan and all the children whose neither EPI card were available nor parents were sure about vaccination profile were excluded from the study. Consecutive (non-probability) sampling technique was used for data collection. Age of the child was determined from the birth registration certificate and the weight (in kgs) of all the children was documented. EPI cards where ever available were checked. In case EPI card was not available, detailed history was taken from the parents of the children about the immunization. For this purpose a standard proforma was used. All the children were examined for BCG scar on their both arms and presence/absence of scar was documented. Vaccination data about seven EPI target diseases (polio, tuberculosis, diphtheria, tetanus, pertussis, hepatitis B and measles) was collected using a standard proforma. All the children were divided in 3 groups i.e. completely immunized, partially immunized and non immunized. From the parents of those who did not vaccinate/ partially vaccinated their children, an open ended question was asked to inquire about the reason of non- vaccination and the reason was documented whereever available. Parents of most of the enrolled children were army personnel, representing all provinces of the country. Fathers of most of the enrolled children had education at least up to matriculation as being an army personell. At the end of the study data obtained was analyzed using statistical package for social sciences (SPSS) software version 14.0. Mean and standard deviation were computed for quantitative variables like age. Frequency and percentage were computed for categorical variables like immunization status.

RESULTS

Total number of children enrolled in the study were 2200. Of these 1221 (55.5%) were female and 979 (45.5%) were male children. Mean age was 20.9 months with standard deviation of ± 6.55. Out of 2200 children, the parents of 1172 (53.27%) children had vaccination cards with them while in 1028 (46.73%) cases vaccination card was not available.

Around 1256 (57.1%) were completely immunized, 740 (33.6%) were partially immunized and 204 (9.3%) were nonimmunized (figure-1). Similarly at least one dose of oral polio vaccine was taken at home by 1975 (89.8%) children while 225 (10.2%) did not receive oral polio vaccine at home. While 1509 (68.6%)

received three doses of oral polio vaccine, 157 cases (7.1%) received only two doses and 328 cases (14.9%) received only a single dose of oral polio vaccine while 206 children (9.4%) were not vaccinated for polio at al. Total number of children vaccinated for polio vaccine was 1994 (90.6%) (figure2), i.e only 0.8% children received parenteral polio vaccine.

Out of 2200 children 1746 (79.4%) were given BCG at birth. While in 1552 (70.5%) cases only BCG scar was present.

For DPT, 1354 (61.5%) children received 3 doses, 98 (4.5%) received two doses, and 196 (8.9%) cases had single dose while 552 (25.1%) cases were not vaccinated for DPT.

Among 2200 children, 1354 (61.55%) children received a dose of measles vaccine but 846 (38.45%) cases were not vaccinated for measles.

DISCUSSION

Initially started with 6 antigens, EPI began in Pakistan in 1976 on a pilot scale and was expanded countrywide in 1978. Since then it has shown a slow but steady rise in different coverage indicators assessed by independent organizations[7].

WHO and UNICEF have been estimating the country's immunization coverage every year using the country's official reports and the available independent survey data. In the mid-1980s, EPI coverage with 3 doses of diphtheria–pertussis–tetanus (DPT 3) vaccine had been around 30% and with 1 dose of measles vaccine (measles 1) had been around 40%. Coverage with both vaccines reached 50%, or above, for the first time in 1990. Coverage remained below 80% for a decade and a half. However, DPT 3 and measles 1 coverage reached the 80% benchmark for the first time in 2005 and 2006, respectively, and remained at 80% until 2007. In 2008, DPT 3 coverage dropped to 73%; however, the official programme database indicates that DPT 3 coverage bounced back to 85% in 2009 and measles 1 coverage remained at 80%. Whereas in 2008, only 30% of the districts attained 80% coverage for DPT 3, by 2009 this figure had increased to 61%. Similarly, the proportion of districts that attained 80% or more coverage for measles1 increased from 46% in 2008 to 54% in 2009[7].

Fully immunized child coverage determined through different surveys conducted during the 1995–2007 period ranged between 47% and 57% with an exception in the Pakistan Social and Living Standard Measurement Survey 2004–2005, which reflected a higher achievement[9,10,11]. In this study, 57.1% children of age 1-3 years were completely immunized, 33.6% were partially immunized while 9.3% were unimmunized which is comparable with above mentioned results.

In a cross-sectional study conducted in September 2006 in Nigeria, vaccination coverage was assessed by vaccination card and maternal history in children between the ages of 12-23 months. A child was said to be fully immunized if he or she had received all of the following vaccines: a dose of Bacille Calmette Guerin (BCG), three doses of oral polio (OPV), three doses of diphtheria, pertussis and tetanus (DPT), three doses of hepatitis B (HB) and one dose of measles and it was concluded that full vaccination coverage against all the seven childhood vaccine preventable diseases was 61.9%[12]. In another cross-sectional study conducted in Nouna district, Burkina Faso, the total immunization coverage was 50.2% in children of 12-23 months of age[13]. In a cross-sectional household survey conducted in 2008 across the Western Cape in order to determine the routine immunization coverage rates in children aged 12 - 23 months showed that the immunization coverage was 76.8% for vaccines due by 9 months and 53.2% for those due by 18 months[14]. Results in all these studies are comparable to that of this study.

A study conducted in peri-urban area of Karachi showed that 45% of the infants were age-appropriately vaccinated. The coverage of individual vaccines was 76% for BCC, 61% for DPT 1, 49% for DPT 2, 45% for DPT 3 and 27% for

measles. But in this study target population was were fully immunized for polio, hepatitis B,

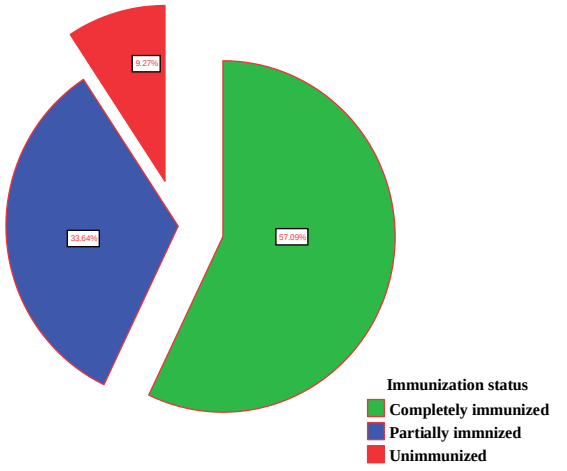

Figure-1: Immunization status of the subjects included in the study.

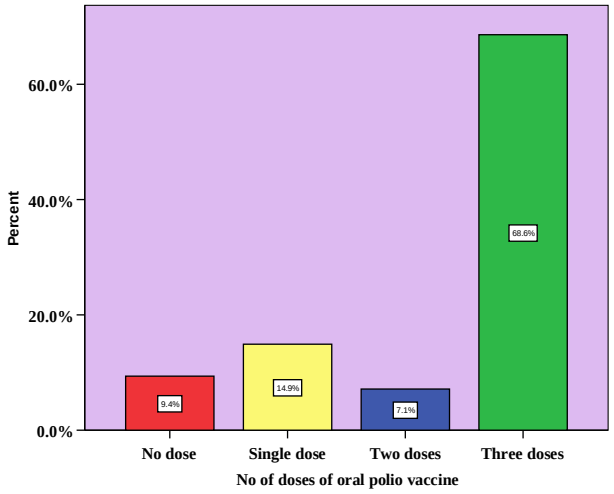

Figure-2: Distribution of oral polio vaccine in the study group.

below one year with mean age of 6.3 months and the study was based purely on the mother's recall[15]. A recent study titled as: "Coverage and predictors of vaccination among children of 1-4 years of age in a rural sub-district of Sindh" concluded that 73.6% children were vaccinated for three doses of PT 82.9% received BCG vaccine which is comparable to the results of our study[16]. UNICEF, in "State of the world's children 2004" reports BCG coverage as 67%, DPT 3 as 63% and measles as 57%. BCG coverage in this study is 79.4% which is higher than reported by UNICEF, possibly because of setting of our study as it was conducted in a military hospital where most of the deliveries take place in hospital setup due to free medical treatment for the families of army personnel and BCG is usually administered to every baby born in the hospital. Measles vaccine coverage i.e. 61.55%, and DPT coverage, 61.5% for DPT 3, 4.5% for DPT 2, 8.9% for DPT 1 in this study is comparable to the above mentioned results. In a study in the KPK Province of Pakistan, 65% of children were fully immunized by three years of age[17]. Another study conducted in Khyber Teaching Hospital, Peshawer, in KPK concluded that 67.14% children in urban sampling while 48.12% children in rural sampling diphtheria, pertussis, tuberculosis, measles and tetanus vaccination, again this study was recall based[18].

Estimated global DTP 3 coverage in the 193 WHO member states was 82% in 2009, during 2007--2009, 149 (77%) countries had sustained DTP 3 coverage of ≥80%. However, coverage in 2009 was <80% in 36 (19%) countries, and six countries failed to achieve 50% DTP 3 coverage[19]. Among the children worldwide who did not receive 3 doses of DTP vaccine during the first year of life in 2009, approximately half live in India (37%) and Nigeria (14%). DTP 3 coverage in the study is less than majority of these countries because of various reasons[20,21].

In this study 61.55% children were vaccinated for meales while in a sudy "One size does not fit all: local determinants of measles vaccination in four districts of Pakistan" by Cockcroft, 50% to 86% of children aged 12-23 months received measles vaccination in four different districts[17].

In this study, 90.6% children were vaccinated for oral polio vaccine while 68.6% received at least three doses of oral polio vaccine, 7.1% received two doses and 14.9% received only a single dose of oral polio vaccine. A recent study

titled as ; “Resistance of polio to its eradication in Pakistan” shows that each year about 10-20% children fail to receive their third dose of vaccine against poliomyelitis. This could possibly be the reason why polio has not been eradicated from Pakistan[22].

In response to an open ended question regarding the reason of not getting the child vaccinated, most common cause was frequent change of location as the army personnel are regularly transferred from one location to another. Other main causes included: a belief that vaccine is harmful for their children, long distance from EPI facility and lack of awareness about vaccination and personal carelessness are consistent with studies conducted in other regions of Pakistan which reported mother being busy, laziness of parents, minor illnesses in children, absence of vaccinators, inconvenient EPI centers, poor quality care, fear of side effects and lack of faith in immunization program[23]. A qualitative study conducted in Karachi, also reported similar causes along with other causes like forgetting scheduled dates, low quality services and inaccessibility of government dispensaries, vaccine cost and prevailing myths about immunization[24].

CONCLUSION

This study concludes that despite significant efforts by the government and partners, Pakistan’s immunization indicators have not met the expected benchmarks and are inadequate to achieve the immunization targets set at the regional and global level.

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