

Vaccination status of children according to age and gender visiting EPI center of 'Nawaz Sharif Social Security Hospital, Lahore

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ABSTRACT

Background: Immunization coverage is a key indicator for monitoring health sector performance and progress towards reducing child mortality. Lack of immunization, results in increased doctor's visits, hospitalizations and premature deaths. Expanded Program on Immunization (EPI) was started in 1976 with the aim of controlling diseases including Tuberculosis for which BCG vaccine is given. BCG scar is very important both clinical & epidemiological viewpoints.

Aim: To find out percentage of children vaccinated appropriately according to their age through EPI Program in the population visiting a tertiary hospital from the catchment area.

Methodology: In this cross-sectional study, vaccination status of 100 children was recorded through consecutive non-probability sampling for one month at 'Nawaz Sharif Social Security Hospital', Lahore. All children of 6 months to 5 years of age from both genders visiting OPD were included except those having history of illness like, septicemia, severe pneumonia, tuberculosis & dysentery. Data included age, gender, body weight, nutritional status, vaccination status of subjects, counseling done by which person and presence of BCG scar. Data frequencies, percentages, cross-tabulation were calculated through SPSS v. 21.0 and presented in pie, bar chart and tables.

Results: Out of 100 study subjects, 65% were male children. Age ranged from 1.5 months to 5 years with mean of 33.5 months. Body weight of children ranged from 1.8 kg to 20kg with mean of 10.94kg and 18% were less than -3SD weight for age and 21% were less than -2SD weight for age, on WHO z-score cut-offs. Out of all, 96% were given BCG followed by Oral Polio Vaccine in 93%, Pentavalent and measles vaccines in 91% and 85% respectively. There was no significant difference due to gender of child on the frequency of being vaccinated. Majority were counseled by lady health worker (55%) in both genders. BCG scar was absent in 36% of study children. When compared with the nutritional status and gender, frequency of cases with absent BCG scar was same in both malnourished & normal weight children as well as in male & female children.

Conclusion: Majority subjects were given BCG followed by OPV, Pentavalent and measles vaccines and counseled by lady health worker. Absent BCG scar was an independent factor not related to gender or nutritional status.

Key words: BCG Scar, EPI vaccines, Nutritional Status

INTRODUCTION

Immunization is the process whereby a person is made immune to an infectious disease, typically by the administration of a vaccine. Vaccines have a role in stimulating the body's own immune system to protect the person against subsequent infection or disease¹. A vaccine usually consists of an agent that resembles a disease-causing microorganism, and is made from weakened or killed forms of the microbe, its toxins or one of its surface proteins². To improve immunization coverage is the basic objective and

indicator for monitoring health sector performance and progress towards reducing child mortality³. Primary prevention of diseases through vaccination remains the major way to protect the child. In the U.S., vaccines have reduced or eliminated many infectious diseases which were responsible for greater morbidity and mortality in the past. However, the viruses and bacteria that cause vaccine-preventable disease and death still exist and can be passed on to people who are not immunized⁴. Vaccine-preventable diseases have many social and economic costs: sick children may miss school and can cause parents to miss time from work. These diseases also result in frequent doctor's visits, hospitalizations, and even responsible for mortality⁵. Globally, immunization services have been the center of renewed interest with increased funding to improve

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services, research for new vaccines, and the development of a health systems approach to improve vaccine coverage⁶. World Health Organization (WHO) and United Nations International Children Educational Fund (UNICEF) launched Expanded Programme on Immunization (EPI) in 1976 with the aim of controlling six childhood diseases: Tuberculosis, Diphtheria, Pertussis, Tetanus, Polio and Measles. Later, vaccines against H. Influenza type b and Hepatitis B have also been added in routine EPI in last decade⁷. Survey showed that nearly 66% of children were incompletely immunized against seven preventable childhood diseases⁸. Major factor for prompt vaccination is counseling done by healthcare providers, including lady health workers (LHW), lady health visitors (LHV), Dispensers, Nurses and Doctors. BCG vaccine is applied on right shoulder over deltoid region. After application, the induration is formed that passes through different stages ultimately leading to scar formation. BCG scar is very important both clinical & epidemiological viewpoints. Clinically it shows vaccine uptake. Epidemiologically it is very helpful in surveys to estimate the coverage of BCG vaccination at population level⁹. The increased cases of measles & diphtheria reporting at hospitals, the presence of certain urban localities having unsatisfactory vaccination coverage and importance of BCG scar prompted the need for a baseline survey among the mothers, visiting hospitals about childhood immunization. This study aspect is essential to explore the factors affecting the nutritional status and accurate delivery of routine immunization in the catchment area.

The objective of the study was to find out percentage of children vaccinated appropriately according to their age through EPI Program in the population visiting a tertiary hospital from the catchment area and to determine the frequency of absence of BCG scar and its association with gender and nutritional status.

METHODOLOGY

This cross-sectional study was conducted at Nawaz Sharif Social Security Hospital, Lahore during a period of one month. As we just determined frequency of age-appropriate vaccination in an hospitals so sample size was empirically taken as 100. Sampling technique used was consecutive non-probability sampling. All children of 6 months to 5 years of age from both genders visiting OPD were included in the study. Children having history of chronic illness like, septicemia, severe pneumonia, tuberculosis & dysentery that hampered

the vaccination process through EPI program were excluded from the study.

Data collection procedure: Among the study subjects, data regarding age & gender of child, body weight, Nutritional status based on WHO z-score cut-offs was categorized as normal weight for age, less than -2SD weight for age and less than -3SD weight for age categories. EPI vaccination status was recorded through vaccination cards for BCG, Oral Polio Vaccines (at least three doses), Pentavalent and measles vaccines (at least single dose). Pneumococcal vaccine was not asked because it was started recently. Data regarding counseling was also recorded. In our setup the healthcare providers in rural slums, urban slums and villages includes lady health workers (LHW), lady health visitors (LHV), Dispensers, Nurses and Doctors. Similarly it was also done by their family elders so recorded in the proforma. BCG vaccine applied on right shoulder over deltoid region, was also validated through examining BCG scar presence.

Data Analysis Procedure: Variables of this study included both categorical and numerical variables. Numerical variables included, age (in months) and body weight (in kg) of children. Their mean, standard deviation was calculated, median and interquartile range (in case of body weight) and also presented as histogram (in case of age). Categorical variables included, gender, nutritional status categories (normal weight for age, less than -2SD weight for age and less than -3SD weight for age), application of EPI vaccination (BCG, Oral Polio Vaccines, Pentavalent & measles vaccines), counseling done by healthcare providers (LHW, LHV, Polio team workers & doctors or their family elders) and BCG scar absence. Data collected were entered in SPSS version 21.0. Their frequencies and percentages were calculated, cross-tabulation done where required and presented as pie chart, bar chart and tables.

RESULTS

Out of 100 study subjects, age of subjects ranged from 1.5 months to 5 years with mean \pm sd of 33.5 ± 18.6 months (Fig. 1). Male children were 65% and female children were 35%. Body weight of children ranged from 1.8 kg to 20kg with mean \pm sd of 10.94 ± 3.18 kg, with higher maximum and interquartile range values in male children as compared to female children.

Nutritional status was categorized and found to be as 61(61%) being normal weight for age, 21% being less than -2SD weight for age and 18% being less than -3SD weight for age categories, based on WHO z-score cut-offs (Fig. 2). Moreover the

difference in 'Nutritional status' was almost same in both genders (Fig. 2).

Out of these children, 96% were given BCG followed by Oral Polio Vaccine (at least three doses) in 93%, Pentavalent and measles vaccines (at least single dose) in 91% and 85% respectively. There was no difference due to gender of child on the frequency of being vaccinated except for slightly increased frequency among male babies for BCG vaccination (figure 3).Majority were counseled by LHW (55%) in both genders. Only 15 to16% children were counseled either by doctors or their family elders (Fig. 4).

BCG scar was absent in 36% of study children. When compared with the nutritional status, BCG scar was absent in 38.8% (14/36) of malnourished children and present in 39% (25/64) of normal weight children and difference is also not statistically significant (table 1). Similarly difference in both genders is also not marked. BCG scar was absent in 35.4% (23/65) of male children and 37% (13/35) of female children (figure 5).

Fig. 1: Age distribution of the study children (n=100)

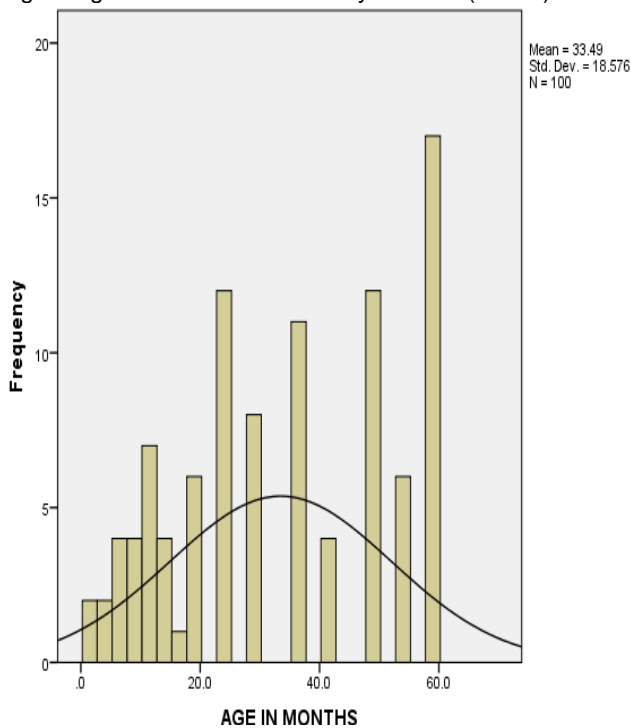


Fig. 2: Comparison of nutritional status (WHO z score values) of study children in both genders (n=100)

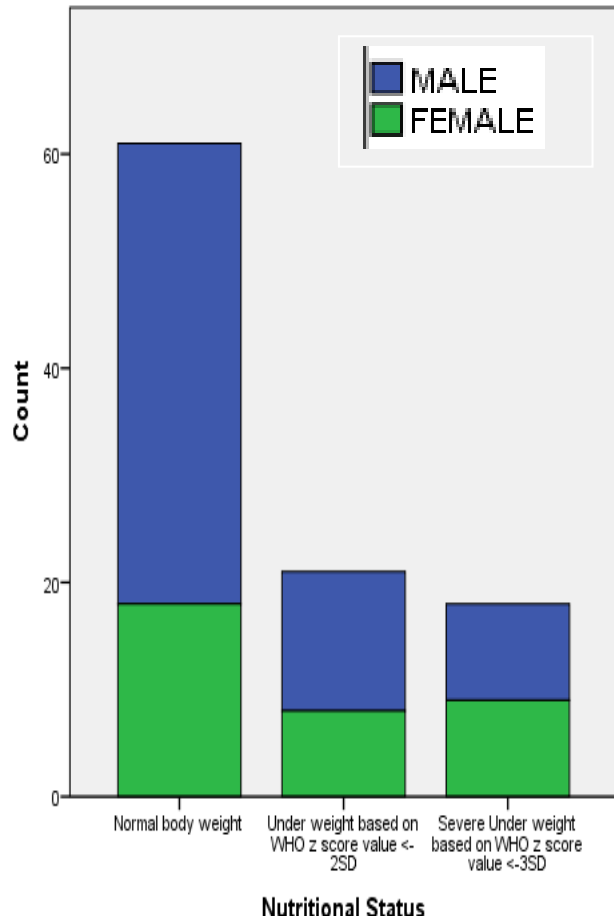
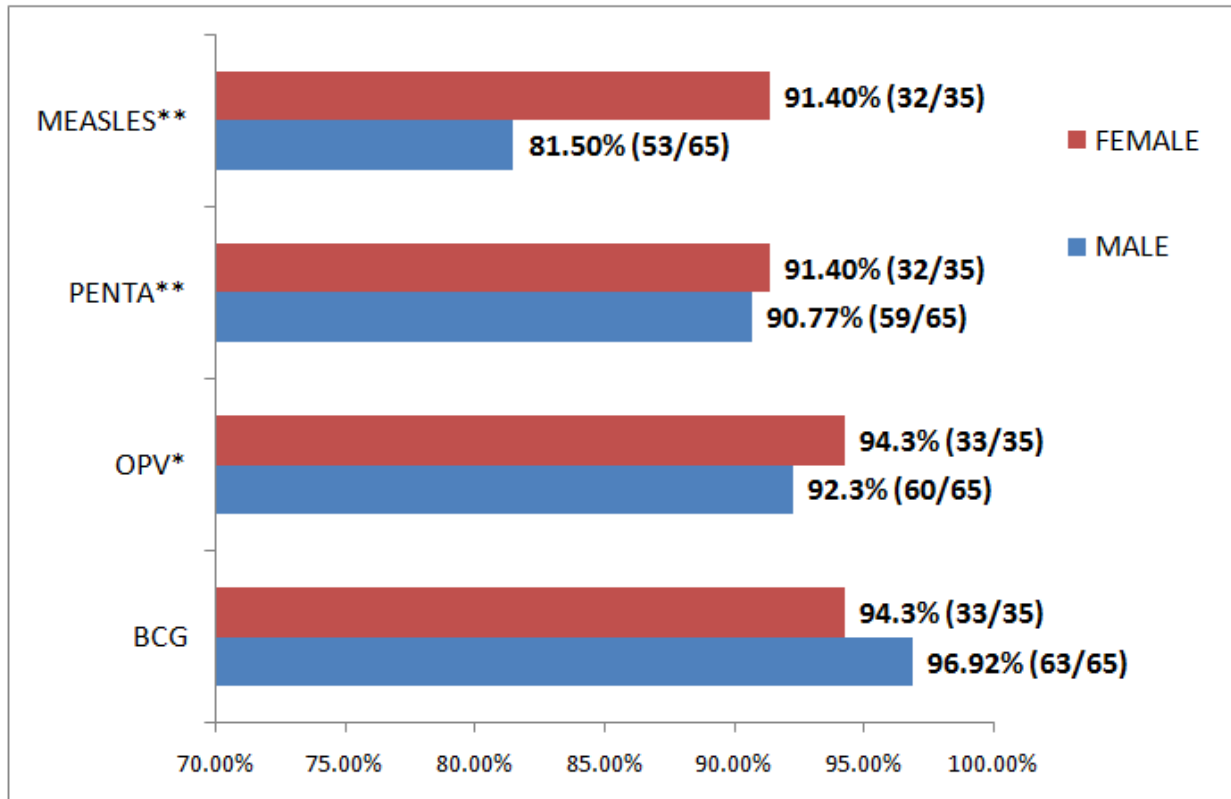


Table 1: Comparison of BCG Scar absence with nutritional status (n=33)

Nutritional Status (based on WHO z score value)	BCG Scar		Total
	Present	Absent	
Normal body weight (between +2SD and -2SD)	34	20	54
Less than ≤-2SD body weight (Some + Severe Underweight)	24	13	37
Total	58	33	91

P>0.05 on chi-square

Fig. 3: Comparison of EPI Vaccination status appropriate for age in both genders(n=100)



*(At least three doses) ** (at least single dose)

Fig. 4: Frequency of Healthcare Providers, who counseled for vaccination of study children (n=100)

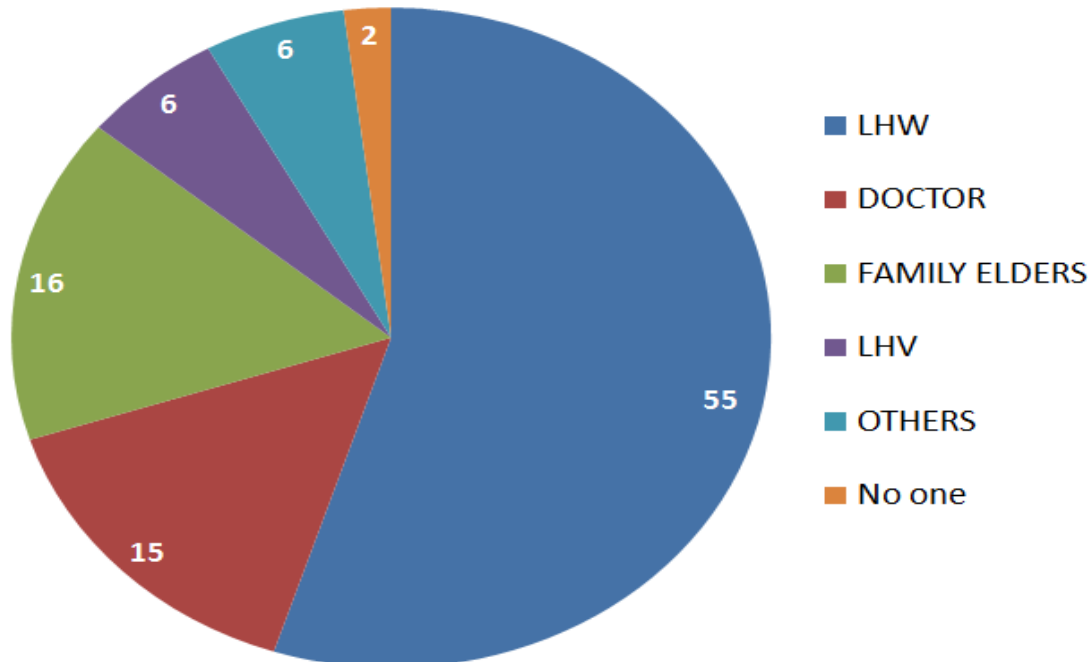
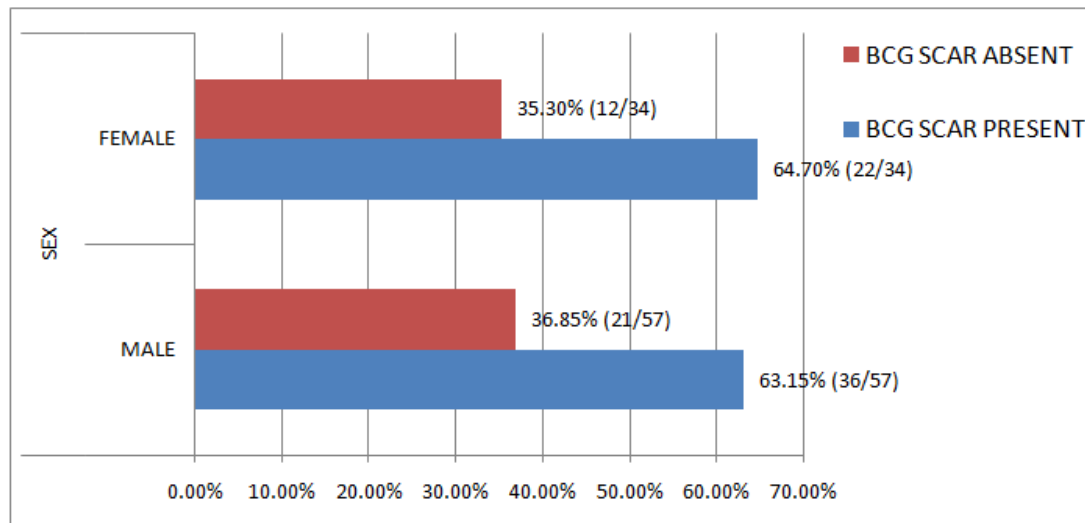


Fig. 6: Comparison of BCG Scar absence with Gender (n=33)



P < 0.05 on chi-square

DISCUSSION

Mission is to eradicate, eliminate or reduce diseases to the lowest levels possible through sustained effort regarding the immunization coverage of all susceptible children as an essential part of primary health care. However, studies have shown that these objectives have not been achieved to the optimal level despite the efforts of more than 30 years by EPI¹⁰. In addition, approximately 10 per cent of children born in Pakistan die before they reach their fifth birthday. The infant and child mortality rates in Pakistan were 78 per 1000 live births and 94 per 1000 in 2007 respectively, with mortality rates being particularly high in rural areas where access to medical care may be limited, and among the poor¹¹. In our study 97% mothers expressed that their children had been vaccinated, though this is the subset of population which is active in seeking healthcare. Furthermore, challenges persist for routine immunization access and coverage in both urban and rural settings, as evidenced by the 2014 measles outbreak that affected thousands and killed hundreds¹². Measles is difficult to control and eliminate and more than 90% of the population must be immune to interrupt transmission and prevent outbreaks. In our study the common sources of information regarding vaccines administered to children were mostly local healthcare providers including LHW, LHV, doctors and staff of antenatal clinics (figure 5). The study results show some insight into the comparison of age, gender and role of healthcare providers about the immunization among the mothers, visiting the hospitals from urban slums,

located in Lahore. It is noteworthy that lady health workers and local doctors played their role to a certain extent in the primary prevention of childhood diseases in the study population. It is need of the time that health education of the masses should be improved by print and electronic media. The cause of malnutrition in the children included in the study was mainly low income. Certain households or an individual may be at higher risk of malnutrition due to differences in income level, or level of education¹³.

BCG vaccine is primarily used against tuberculosis¹⁴. This vaccine was first used medically in 1921¹⁴. In countries where tuberculosis is common one dose is recommended in healthy babies after birth¹⁴. Babies who have immune deficiency disease should not be vaccinated against tuberculosis¹⁵.

CONCLUSION

- Majority subjects were given BCG followed by OPV, Pentavalent and measles vaccines and counseled by lady health worker. Frequency of cases vaccinated was not related to gender or nutritional status.
- BCG scar was absent in one third of those subjects given BCG. It is also an independent factor not related to gender or nutritional status.

RECOMMENDATIONS

- Immunization is a proven tool for controlling and eliminating life-threatening infectious diseases. It is one of the most cost-effective health investments & interventions, with proven

strategies that make it accessible to even the most hard-to-reach and vulnerable populations.

- BCG Scar presence is required to confirm uptake of vaccination besides other factors adversely affecting immunization coverage.
- Factors affecting absence of BCG scar need further studies.

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