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STUDY THE VACCINATION STATUS OF INFANTS UNDER 1 YEAR OF AGE IN TWO TEACHING HOSPITALS OF LAHORE

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Abstract:

Background: *Vaccination is the administration of antigenic material (a vaccine) to produce immunity against a disease. Vaccine can prevent the effects of infection by many pathogens.*

Objectives: *The overall objective of the EPI is reduction of mortality and morbidity from the eight EPI diseases by offering immunization services. With this objective, the Program started in Pakistan in 1978 and is still continuing. The program is evaluated at intervals of 2-3 years.*

Methodology: *A questionnaire was designed by the students. Data was collected from mothers with child up to 1 year of age by visiting outdoor patients and pediatrics ward. A total of 300 children of both sexes were included. Data was collected about age and sex of child, knowledge and source of vaccination, BCG scar mark and history of number of injections for vaccination. Questions were asked from mothers regarding their education, father's occupation and monthly income.*

Results: *There were total 300 children. Out of these, 258 were vaccinated and 42 were not vaccinated. 57.67% (173) were males and 42.33% (127) were females. 73.3% children had the BCG Mark. 92.7% mothers had knowledge about vaccination.*

Conclusion: *We concluded that the EPI coverage of infants coming to Sharif Medical Hospital OPD and wards is quite low, as compared to that set by the government target.*

Keyword: *Vaccination, Infants, EPI, Immunity, Vaccine.*

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INTRODUCTION:

It is a defense mechanism of body or in other words, the reaction of body towards any foreign substance or non-self. Non-Specific or Innate Immunity, Specific or Acquired Immunity. It is present in all the living beings irrespective of their stage in evolution. It can be initiated against any invader without any previous contact. It requires pervious knowledge of the antigen, reacts specifically with the corresponding antigen and time is required to mount the attack. This type of immunity is present only in vertebrates. This specific immunity is associated with evolution of lymphoid tissue. An antigen is defined as "any foreign substance that elicits an immune response (e.g., the production of specific antibody molecules) when introduced into the tissues of a susceptible animal and is capable of combining with the specific antibodies formed". An antibody (Ab), also known as an immunoglobulin (Ig), is a large Y-shaped protein produced by B-cells that is used by the Immune system to identify and neutralize foreign antigens. It is the immunity which an individual develops as a result of infection or by specific immunization and is usually associated with presence of antibodies or cells having a specific action on the micro-organism concerned with a particular infectious disease or on its toxin. Active immunity is usually permanent. It comes from B-cells which proliferate and manufacture specific antibodies after antigen presentation by macrophages. The antibodies are localized in the immunoglobulin fraction of the serum. It provides defense against bacteria, bacterial toxins, & viruses. It involves the activities of specific white blood cells (T cells). These cells do not secrete antibodies but are responsible for recognition of antigen. It provides defense against cancer cells, virus-infected cells, fungi, animal parasites, & foreign cells from transplants. B and T lymphoid cells are responsible for recognizing self or non-self antigens. Very often, they co-operate with one another and certain accessory cells like macrophages and human K-cells, their joint function constitutes the complex process of immunity. The EPI was started in 1978 in Pakistan and considered as a component of Accelerated Health Program in 1983. 1000 deaths in less than 5-year children will daily occur in Pakistan, if EPI is discontinued. It is a world-wide Program being carried out in all countries assisted by WHO, UNICEF and other donor agencies. The global target of the Program is to immunize over 95% of infants and child-bearing-age females. Pakistan has made significant improvement in EPI coverage in comparison to India and Afghanistan, but has to adopt a more aggressive implementation strategy to compete with other countries of the region. Only 47% of Pakistani children age 12–23 months had received all recommended vaccines. More than 80% percent of children received BCG and the three Polio vaccines, while fewer received the subsequent doses of DPT, Hepatitis B and Measles. 6% of children had not received any of the recommended vaccines. Boys are more likely to be fully vaccinated than girls (50 versus 44). Vaccination coverage is higher in urban areas than rural areas (54 versus 44 percent). There is marked variation in vaccination coverage by province, ranging from only 35% vaccinated in Balochistan to 53% in Punjab.

MATERIAL AND METHODS:

The Study Design was a cross-sectional observational study. The research was carried out for a period of 30 days. In outdoor patients and pediatrics ward of Sharif Medical Hospital and Jinnah Hospital, Lahore**.** A total of 300 children were selected by convenience sampling technique. Samples were collected from Children under 1 year of age. Editing, codification and tabulation along with analysis was considered. Remove ambiguity, check accuracy and find any missing data. Statements and answers are converted into numbers. Responses to questions are categorized and classified. Tables were made from responses. Tabled data is explained in words. Data was analyzed by supervisor. After analysis the conclusion and suggestions came into being**.** The present observational cross-sectional study **"**Vaccination Status of infants under 1 year of age" in OPD, Pediatric ward of Sharif Medical Hospital and Jinnah Hospital, Lahore was conducted.

RESULTS:

The following results were observed:

Table I: Age (In Months) Wise Characteristics of Infants

Characteristics	Age (in months)
Total	300
Mean	7.22
Median	7.00
Mode	12
Std. Deviation	3.60
Std. Error of Mean	0.21
Range	11
Minimum	1
Maximum	12

shows that mean and median age of infants was 11.88 and 12.00 months respectively.

Table II: Age Wise Distribution of Infants

Age (in months)	Frequency (n)	Percentage
0-2	37	12.33
3-4	41	13.67
5-6	61	20.33
7-8	31	10.33
9-10	56	18.67
11-12	74	24.67
Total	300	100.0

shows that 24.67% infants were of age between 11-12 months.

Table III: Age and Sex Wise Distribution of Infants

Age (in months)	Sex	Total	
	females	males	
0-2	13	24	37
3-4	18	23	41
5-6	35	26	61
7-8	14	17	31
9-10	22	34	56
11-12	25	49	74
Total	127	173	300

shows that out of 300 infants 127 were females and 173 infants were male.

Table IV: Distribution of Mother's Education

Mother's Educational Status	Frequency (N)	Percent
Illiterate	183	61.0
Primary	19	6.3
Middle	26	8.7
Secondary	26	8.7
Intermediate	14	4.7
Graduate	25	8.3
Post graduate	7	2.3
Total	300	100.0

shows that 61% mothers were illiterate and only 10.6% were highly educated.

Table V: Distribution of Father's Educational Status

Father's education status	Frequency (n)	Percent
Illiterate	139	46.3
Primary	29	9.7
Middle	46	15.3
Secondary	43	14.3
Intermediate	19	6.3
Graduate	17	5.7
post graduate	7	2.3
Total	300	100.0

shows 46.3% fathers were illiterate whereas 2.3% fathers were post graduate.

Table VI: Distribution of Father's Occupation

Father's Occupation	Frequency	Percent
Laborer	90	30
Farmer	58	19.33
Private servant	33	11
Businessman	28	9.33
Government servant	24	8
Driver	20	6.67
Shopkeeper	18	6
Landlord	15	5
Jobless	14	4.67
Total	300	100.0

shows that 30% fathers were laborers and only 4.67% were jobless.

Table VII: Knowledge of Mothers about Vaccination

Knowledge	Frequency (n)	Percent
Yes	278	92.7
No	22	7.3
Total	300	100.0

shows that 92.7% mothers had knowledge about vaccination.

Table VIII: Source of Knowledge about Vaccination

Source	Frequency (n)	Percent
LHW	111	37
Vaccinator	59	19.67
Relatives	52	17.34
Doctor	43	14.33
No knowledge	22	7.33
Media	13	4.33
Total	300	100.0

shows that 37% of mothers got knowledge about vaccination from LHWs and media had a contribution of only 4.33% to mother's knowledge about vaccination.

Table IX: Vaccination Coverage of Infants

Vaccination coverage	Frequency (n)	Percent
Yes	258	86.0
No	42	14.0
Total	300	100.0

shows that 86.0% infants were vaccinated and 14.0% unvaccinated.

Table X: Vaccination Status of Infants

Vaccination status	Frequency	Percent
Complete	185	61.67
Incomplete	73	24.33
Not vaccinated	42	14.0
Total	300	100.0

shows that 61.67% infants had complete vaccination and 24.33% had incomplete vaccination

Table XI: Source of Vaccination

Source of Vaccination	Frequency (n)	Percent
Vaccinator	115	38.3
Hospital	87	29.0
LHW	52	17.3
Unvaccinated	42	13.0
General physician	4	1.3
Total	300	100.0

shows that 29.0% vaccine was given by the hospital.

Table XII: Presence of BCG Mark

BCG scar	Frequency (n)	Percent
Present	220	73.3
Absent	80	26.7
Total	300	100.0

shows that 73.3% Infants had BCG Mark.

Table XIII: Gender Wise Vaccination Status

sex	Vaccinated	Non vaccinated	Total		
	N	%age	N	%age	
females	108	85.04	19	14.96	127
Males	150	86.79	23	13.29	173
Total	258		42		300

shows that 85.04% females and 86.79% male infants were vaccinated.

Table XIV: Rural Versus Urban Population

Residence	Vaccinated	Non vaccinated	Total		
	n	%age	No	%age	
urban	112	84.85	20	15.15	132
rural	146	86.90	22	13.09	168
total	258		42		300

shows almost 84.85 infants from urban areas and 86% infants' rural areas were vaccinated.

Table XV: Sex and Residence Wise Distribution of Vaccination Status of Infants

Sex	Vaccination Status	Residence	Total	
		Urban	Rural	
Females	yes	52	56	108
	no	9	10	19
	total	61	66	127
Males	yes	60	90	150
	no	11	12	23
	total	71	102	173

shows that 85 % of girls and 84 % of boys in urban areas are vaccinated, whereas 84% of girls and 88 % of boys in rural areas are vaccinated.

Table XVI: Occupation of Father Versus Vaccination Status of Infant

Father's Occupation	Vaccination Status	Total	
	Yes	No	
Laborer	78	12	90
Farmer	49	9	58
private servant	29	4	33
Businessman	25	3	28
government servant	22	2	24
Driver	16	4	20
Shopkeeper	15	3	18
Landlord	15	0	15
Jobless	9	5	14
Total	258	42	300

shows that 15 out 0f 15 infants of landlords had complete vaccination and only 9 out of 14 infants of jobless fathers had complete vaccination.

Table XVII: Mother's Education Versus Status of Infants Vaccination

Mother's Education Status	Vaccination Status	Total	
	Yes	No	
Illiterate	147	36	183
Primary	19	0	19
Middle	24	2	26
Secondary	24	2	26
Intermediate	12	2	14
Graduate	25	0	25
post graduate	7	0	7
total	258	42	300

shows that 147 out of 183 infants of illiterate mothers were vaccinated and 30 out 0f 30 infants of highly educated mothers were vaccinated.

Table XVIII: Father's Education Versus Status of Infants Vaccination

Father educational status	Vaccination status	Total	
	Yes	no	
Illiterate	109	30	139
Primary	26	3	29
Middle	41	5	46
Secondary	39	4	43
Intermediate	19	0	19
Graduate	17	0	17
Post graduate	7	0	7
Total	258	42	300

shows that 109 out of 139 infants of illiterate fathers were vaccinated whereas 7 out of 7 infants of fathers having education up to post graduation were vaccinated.

Table XIX: Monthly Income Versus Vaccination Status

Monthly Income (Pkr)	Vaccinated	Non-Vaccinated	Total		
	N	%age	N	%age	
<10000	172	82.69	36	17.31	208
10000-20000	67	94.36	4	5.64	71
>20000	19	90.48	2	9.52	21
Total	258		42		300

shows that only 82.69% of infants belonging to families having monthly income less than 10,000 PKR had been vaccinated, whereas greater than 90% infants belonging to families having monthly income greater than 10,000 PKR

Table XX: Order of Birth Versus Vaccination Status

Order of Birth of Baby in Family	Vaccinated	Non-Vaccinated	Total		
	N	%age	N	%age	
1st	58	84.06	11	15.94	69
2nd	66	94.28	4	5.72	70
3rd	64	96.97	2	3.03	66
4th	28	84.85	5	15.15	33
5th	15	65.22	8	34.78	23
>5th	27	69.23	12	30.78	39
Total	258		42		300

shows that only 84.06% of 1st born child are vaccinated, whereas above 94% of 2nd and 3rd born infants are vaccinated. However, the percentage for 5th or greater born child falls below 70%.

DISCUSSION:

The present observation cross-sectional study "Vaccination status of infants under 1 year of age" in 0PD, Pediatric ward of Sharif Medical Hospital and Jinnah hospital, Lahore. The study included all the infants including males and females up to 1 year of age. Out of 300 infants 42.3% were females and 57.7% were males. In the present study 24.67% infants were of age between 11-12 months in which 16.3% were females and 8.3% were males. The study also showed that the mean age of total infants was 7.22 months, median 7, mode 12 and standard deviation 3.61 months and standard error of mean 0.208. The study showed that 92.7% of the mothers had knowledge about vaccination and only 7.3% mothers had no knowledge about vaccination. In

crude (unadjusted) analysis, knowledge was found to have a positive association with appropriate vaccination of infants. However, better knowledge did not have an independent effect on vaccination status of the infants, once education was introduced in the model especially the maternal education. In our study 61% mothers were illiterate, 6.3% had primary education, 8.7% had secondary education, 4.7% had education up to intermediate, 8.3% were graduates and 2.3% were post graduate. Out of 258 vaccinated infants, 80% infants of illiterate mothers were vaccinated and 100% infants of highly educated mothers were vaccinated. This shows that educated mothers had better vaccination status of their infants. Our study correlates with study conducted in Sindh which shows that maternal education was an important determinant of vaccination status of infants. The current study also showed that 37% knowledge about vaccination was provided by LHWs, 19.67% by Vaccinator, 4.33% by Media, 14.33% by Hospital and 17.34% by relatives. The present study is compared with a study conducted in Lahore where 33% knowledge is provided by the health care providers. In the present study, 86% infants were vaccinated and 14% were unvaccinated. Among vaccinated 61.67% of infants were completely vaccinated and 24.33% incompletely vaccinated. These results can be compared with a study conducted in Lahore where 59% infants <5 years of age were fully vaccinated, 32% infants had one or two doses and 9% didn't have any vaccination. The present study also showed that 30% infants got vaccination from Hospital, 38.3% from Vaccinator, 17.3% from LHW and 1.3% by G.P. This shows that Vaccinator plays a major role in providing vaccination to infants as they had adequate knowledge and were partly satisfied with the services they provide. When BCG scar mark was checked, BCG scar mark was present in 73.3% infants which is a sign that infants were surely vaccinated. This is comparable with the study conducted in Karachi where out of 250 infants, 201 (80%) showed presence of BCG scar. out of total 258 vaccinated infants, 220 had a BCG scar mark i.e., 85.27% of vaccinated infants had a BCG scar mark, as compared to 14.8% who didn't have the scar mark. This is comparable to a large study held in Sri Lanka where 89% infants had a BCG scar mark and 11% didn't. Thus, indicating that, for unknown reasons, the BCG scar mark is not always present after vaccination. The study also indicated that out of 42 infants (not vaccinated) maximum were not vaccinated because of unawareness of their parents about vaccination which is an alarming sign for health faculty. Our study is compared with a study conducted in Peshawar which showed that causes for non-immunization were unawareness of parents/guardians (25.62%), busy/family problems (24.37%), centers too far (23.75%), wrong ideas/sterility (11.88%), sick child (6.88%) and fear of reactions (1.25%). The present study showed that 85 % of girls and 84 %of boys in urban areas are vaccinated, whereas 84% of girls and 88 % of boys in rural areas are vaccinated which means an almost equal vaccination coverage in rural and urban areas. This is in contrast with a study conducted in Peshawar which shows inequality in childhood vaccination between urban and rural areas. However, GAVI supports the results of our research in its recent report where it states "in Pakistan, some mothers were previously not accessing immunization services because they were not comfortable with coming into contact with male vaccinators. With the support of a health system strengthening grant from GAVI, Pakistan has trained 15,000 community-based LHWs in 38 districts to work on immunization, according to a comprehensive view of the program, households in areas with LHWs were 15% more likely to have immunized infants below 3 years. Hence, justifying the rise in girl's vaccination status, as well as overall vaccination status among infants in Pakistan. The study showed maximum infants about 28.6% who were not vaccinated had fathers who were laborer's because those fathers had not got enough time to go and get their infants vaccinated. Also, only 82.69% of infants belonging to families having monthly income less than 10,000 PKR had been vaccinated, whereas greater than 90% infants belonging to families having monthly income greater than 10,000 PKR. This shows that infants who were not vaccinated belong to poor socioeconomic families. The study also brought into attention the relation between birth order of the baby and vaccination status, establishing the fact that only 84.06% of 1st born child are vaccinated, whereas above 94% of 2nd and 3rd born infants are vaccinated. However, the percentage for 5th or greater born child falls below 70%. The rise in vaccination coverage for 2nd and 3rd child is explainable by the fact that most of the parents, although very enthusiastic about first baby, are inexperienced and unaware about the importance of vaccination, its importance and the derogatory effect on the health of the child if not vaccinated. However, after going through the experience of bringing up the first child and dealing with his health, they are more aware about vaccination and its benefits for the forthcoming child. In the present study the less coverage (86%) of vaccination was due to different reasons. i.e., unawareness of mother about vaccination, occupation of father, poor socioeconomic status and low educational status of both father and mother.

CONCLUSION:

In current study, we concluded that 92.7% mothers had knowledge about vaccination and the source was mainly through Vaccinators, LHWs, and hospitals. The vaccination coverage was only 86% among infants. However, only 61.67% of infants had complete vaccination for age. It is evident from the study that lack of appropriate information is still the main hurdle for success of primary immunization. Special health education camps and community mobilization may help in identifying and referring the infants for vaccination. Every opportunity should be used to vaccinate eligible infants in these areas if we want to achieve the goal of 100% immunization coverage. Socioeconomic, educational and occupational status of parents especially education of mothers directly affects the vaccination status of infants. Improvement in the immunization coverage may be achieved by targeting illiterate mothers, inaccessible and far-flung areas and low socioeconomic population sector of Pakistan and spreading awareness among people regarding complete vaccination schedule and its importance.

RECOMMENDATIONS:

1. Some effective awareness programs should be launched involving media to improve knowledge of mothers about vaccination.
2. The findings suggest that children living in distant union councils are less likely to be vaccinated. There is a need of organizing EPI services at BHU level to improve reach and increase the vaccination coverage.
3. Rural, suburban and far distant areas can be covered by planned and organized mobility of vaccination teams, maintaining record of newly born babies at all union council levels and starting community meetings with the help of local individuals in that particular area regarding EPI.
4. Mechanisms of monitoring and supervision should be improved to enhance coverage. Newer approaches such as electronic records keeping and analysis should be considered
5. For the betterment of socioeconomic status, a relatively long-term planning in rural areas is required.
6. Full involvement of LHWs in EPI programs.
7. Special incentives should be given to the vaccinators to make EPI coverage better in rural areas.
8. Those children who have not been vaccinated should be targeted for vaccination especially against emerging epidemics like hepatitis B.

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