

## IMMUNISATION STATUS OF CHILDREN OF PARENTS BELONGING TO VARIOUS EDUCATIONAL GROUPS\*

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Prophylactic immunisation is an important strategy in the control and/or eradication of many communicable diseases, which have in the past taken a heavy toll of human life. The number of diseases amenable to prevention in this manner has increased in recent years. Against some of these, e.g. smallpox, poliomyelitis, tetanus, diphtheria, whooping cough and typhoid fever, prophylactic vaccine is one of the most important weapons of attack. Immunisation does much more than protect the individuals who receive them. Given on a large scale, it reduces the number of susceptible individuals in the community, and thus helps to build up herd immunity, which will check the spread of the disease in epidemic proportions in a given population. An immunisation programme, if properly planned and executed, would probably be the best and the cheapest investment that a country can make for raising the level of health of its people.

Very few studies on the influence of parental education on the immunisation status of children seem to have been done in India. Gupta and Agarwal (1972) noticed that 2.3% of the urban and 4.3% of the rural children around Delhi had not received primary smallpox vaccination. B.C.C. vaccination had been administered

to 18.4% of the urban and 1.2% of rural children. Immunisation with D.P. (diphtheria-pertussis-tetanus) had been done in 38.8% of the urban and 0.6% of the rural pre-school age children. 23.7% of the urban and no rural child had been immunised against poliomyelitis. It was also observed that the immunisation status of the children improved with a rise in the educational status of the parents.

### Material and Methods

This study was conducted in the latter half of the year 1973, in Patiala City, which has the services of a large teaching hospital and several other health institutions. A comprehensive immunisation clinic is being run in the Government Rajendra Hospital under the Department of Social and Preventive Medicine, where routine vaccinations are available to the public. During the year 1973, a total of 31,048 vaccinations were performed at this clinic, the details of which are given below:

Smallpox	...	5,009
B.C.G.	...	459
T.A.B. (Typhoid)	...	4,106
Cholera	...	413
D.P.T.	...	10,420
D.T. (Diphtheria-tetanus)		1,807
T.T. (Tetanus toxoid)		734
O.P.V. (Oral polio vaccine)		8,100

The aim of this study was to determine the immunisation status of the children (up to 15 years) of parents from certain

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educational groups. In all, children from 100 families were studied. On the basis of the educational attainments of the respondents (parents), the study-sample was divided into two broad categories—'the medically educated' and 'the non-medically educated'. From among the former, two groups were chosen. One group comprised the children of doctors and the other those of the paramedical personnel, hereinafter called 'group I' and 'group II' respectively. Among the non-medically educated persons too, there were two groups, viz., 'the non-medical highly educated group' comprising post-graduates in arts, science and engineering graduates, and the 'non-medical moderately educated group' having other qualifications up to the degree level but not less than matriculation. These two groups are referred to as 'group III' and 'group IV' respectively. Representative and random samples of 50 families each for group I and II, were drawn from the various health institutions in the city. Similar samples of 50 families for each of the groups III and IV, were drawn from the various non-medical institutions, like schools, colleges and government offices.

A proforma for the study was evolved and pre-tested. The parents were interviewed by the principal author according to the proforma, and their children were examined for the presence of scars of B.C.G. and smallpox vaccinations. The other common immunisations, i.e. polio, diphtheria, pertussis and tetanus vaccinations, were ascertained from the history. In addition to primary vaccinations, booster doses were carefully enquired into and recorded. The children who were not available at the time of the first visit, were examined at subsequent visits.

The individual immunisations received by each child were categorised into 'regular' and 'irregular' according to whether or not these had been administered according to the prescribed schedule. Regular immunisation meant the administration of a full course of primary vaccination, reinforced by appropriate booster doses, as and when indicated, so that the individual could be presumed to be well-protected against the disease at the time of the interview. The children who had received an incomplete course of the primary vaccination were, for all intents and purposes, treated as 'not immunised'.

### Observations and Discussion

#### *Smallpox vaccination*

In all, 357 children were examined, and out of these, 351 (98.3%) were found to have been vaccinated against smallpox. 6 children (1.7%) were unprotected. Among the immunised children, vaccination has been regular in 164 (46.0%) and irregular in 187 (52.3%). (Table I)

The percentage of children immunised was the highest (100.0%) in the families of doctors (group I). It was 96.1, 97.8 and 99.1 per cent in groups II, III and IV respectively. Primary vaccination had not been received by 3 children in group II, 2 children in group III and 1 child in group IV. In 5 of the 6 unprotected children, vaccination had been postponed, because of apathy or laziness on the part of the parents, who were otherwise favourable to vaccination. The parents of the sixth child, belonging to group IV, were, however, averse to vaccination.

60% of the children in group I had received vaccination regularly according to the schedule. The corresponding figures

**Table 1.** *Smallpox vaccination status of children.*

Educational group	Total children	Immunised						Not immunised	
		Regular		Irregular		Total		No.	%
		No.	%	No.	%	No.	%	No.	%
I	75	45	60.0	30	40.0	75	100.0	0	0
II	77	42	54.5	32	41.6	74	96.1	3	3.9
III	93	40	43.0	51	54.8	91	97.8	2	2.2
IV	112	37	33.0	74	66.1	111	99.1	1	0.9
Total	357	164	46.0	187	52.3	351	98.3	6	1.7

$\chi^2 = 21.63$

df = 6

p &lt; 0.01

Note :—In calculating  $\chi^2$  and df in this and subsequent tables, the number of children with regular immunisations, irregular immunisations, not immunised and total children were taken into consideration.

for groups II, III and IV were 54.5%, 43.0% and 33.0% respectively.

#### *B.C.G. vaccination*

Of the total sample of 357 children, B.C.G. vaccination was received by 64.7%. Group-wise, it was 85.3%, 66.2%, 58.1% and 54.5% in groups I, II, III and IV respectively.

The percentage of children who had received regular B.C.G. vaccination was the highest in group I (56.0%), followed in decreasing order by groups II (45.5%), III (32.3%) and IV (25.0%).

#### *Immunisation against diphtheria, pertussis and tetanus*

In this study, 48.2% of the children

were found to have received primary vaccination with DPT/DT/TT, while 51.8% had not been immunised. Further analysis revealed that the percentage of non-immunised children was the highest in group IV (73.2%), diminishing to 57.0% in group III, 45.4% in group II and 20.0% in group I. It is noteworthy that 20% of the children of doctors had not received D.P.T. a very important immunisation.

32.2% of the children had regular vaccination. In 16.0%, the vaccination had been irregular. The incidence of regular vaccination was the highest in group I (60.0%), followed in decreasing order by groups II (34.6%), III (31.2%) and IV (11.6%).

**Table 2.** *B.C.G. vaccination status of children.*

Educational group	Total children	Immunised						Not immunised	
		Regular		Irregular		Total		No.	%
		No.	%	No.	%	No.	%	No.	%
	75	42	56.0	22	29.3	64	85.3	11	14.7
II	77	35	45.5	17	22.7	52	66.2	25	33.8
III	93	30	32.3	24	25.8	54	58.1	39	41.9
IV	112	28	25.0	33	29.5	61	54.5	51	45.5
Total	357	135	37.8	96	26.9	231	64.7	126	35.3

$x^2 = 28.8$       df: 6       $p < 0.01$

**Table 3.** *Immunisation status of children in respect of vaccination with D.P.T/D.T/T.T.*

Educational group	Total children	Immunised						Not immunised	
		Regular		Irregular		Total		No.	%
		No.	%	No.	%	No.	%	No.	%
I	75	45	60.0	15	20.0	60	80.0	15	20.0
II	77	28	36.4	14	18.2	42	54.6	35	45.4
III	93	29	31.2	11	11.8	40	43.0	53	57.0
IV	112	13	11.6	17	15.2	40	26.8	82	73.2
Total	357	115	32.2	57	16.0	182	48.2	185	51.8

$x^2 = 71.81$       df = 6       $p < 0.01$

**Table 4.** *Polio-vaccination status of children.*

Educational group	Total children	Immunised						Not immunised	
		Regular No.	Regular %	Irregular No.	Irregular %	Total No.	Total %	No.	%
I	75	45	60.0	17	22.7	62	82.7	13	17.3
II	77	27	35.1	17	22.1	44	57.2	33	42.8
III	93	27	29.0	16	17.2	43	46.2	50	53.8
IV	112	16	14.0	14	12.5	30	26.8	82	73.2
Total	357	115	32.2	64	18.0	179	50.2	178	49.8

$$\chi^2 = 63.17$$

$$df =$$

$$p < 0.08$$

#### *Polio vaccination*

50.2% of the children had received at least a course of primary vaccination with O.P.V., while 49.8% had not been immunised. The vaccination had been regular in 32.2% and irregular in 18.0%. Group I showed the highest coverage (82.0%) and group IV the lowest (26.8%), as shown in Table 4.

The rate of regular vaccination was the highest in group I (60.0%), followed in decreasing order, by groups II (35.1%), III (29.0%) and IV (14.3%). These figures are nearly identical with the corresponding figures in Table 3, as D.P.T. and O.P.V. are generally administered simultaneously.

#### **Discussion**

Immunisation practices in 357 children of parents belonging to four educational groups were studied in relation to the common vaccinations. The highest coverage (98.3%) was noted in the case of smallpox

vaccination. Next came B.C.G. vaccination (64.7).

The figure for DPT/DT/TT was 48.2% and that for OPV 50.2%. The high vaccination rate noticed in this study are probably due to the fact that the study sample was a deliberately biased one, being drawn from educated families only. It is well known that education favourably influences the health practices of the people. The availability of adequate immunisation services in this city might be another reason. The comparatively higher rates for smallpox and B.C.G. vaccinations seem to be due to the fact that these two vaccinations are being administered as part of the national health programmes.

In the medically educated groups (doctors and paramedicals) the percentage of children covered, with smallpox vaccine, B.C.G. vaccine, DPT/DT/TT and O.P.V. was 98.0, 76.3, 67.1 and 69.7 respectively. The corresponding figures for the non-medically educated groups were 98.5,

31.2, 34.2 and 35.6. Thus it would be seen that though there was no appreciable difference in coverage with smallpox vaccination, the coverage with the other three vaccinations was considerably higher in the medically educated groups than in the non-medically educated groups, presumably because of greater health-consciousness among the former. The almost equal coverage with smallpox vaccination could be due to the fact that this is the only vaccination compulsory by law, and the services are available to the people at their door-step as a part of the National Smallpox Eradication Programme. Moreover this vaccination is the oldest and the most well-known.

Protection value of a vaccine depends on, among other things, its administration according to a prescribed schedule. It was observed that in the medically educated groups (I and II), the percentage of children who had received regular vaccination was 57.2 for smallpox, 50.1 for B.C.G., 48.0 for DPT/DT/TT and 47.4 for OPV. In the non-medically educated groups (III and IV), the corresponding figures were 37.6, 28.3, 20.5 and 21.0. Thus the rates of regular vaccinations were considerably higher in the medically educated groups. This was true even for smallpox vaccination, though there was not much difference as far as the overall coverage was concerned. This is an important pointer to the fact that the community at large has to be educated about the importance as also the schedule of administration, which is equally important.

In the total sample, regular coverage with smallpox vaccine was only 46.0% against an overall coverage of 98.3%. Group-wise analysis revealed that regular vaccination was the highest in group I

(60.0%), followed by groups II (54.5%), III (43.0%) and IV (33.0%). This shows that parental education, particularly medical education, is an important motivating factor for receiving re-vaccination in order to maintain a satisfactory level of immunity. Another important inference would be that, apart from ignorance about the necessity of re-vaccination, negligence on part of the parents is yet another reason for delaying or omitting the same. It is noteworthy that even doctors, the most knowledgeable group, did not bother to get 40% of their children re-vaccinate.

The highest coverage with B.C.G vaccination was seen in group I (85.3%). In groups II, III and IV, it was 66.2%, 58.1% and 54.5% respectively. The educational level of the parents seems to influence this immunisation practice also.

The rates of DPT/DT/TT vaccinations also declined with the decrease in the educational status of the parents. Group I was found to have a coverage of 80.0% compared to 26.8% in group IV. It was 54.6% and 43.0% in groups II and III respectively. The regularity was maximum in group I (60.0%), followed by 36.4%, 31.2% and 11.6% in groups II, III and IV respectively. It is remarkable, however that 20% of the children of the doctors were denied primary vaccination, and of the vaccinated children, another 20% failed to receive booster doses. The position was still worse in the case of other groups.

A more or less similar picture was seen in respect of polio-vaccination, conceivably due to the practice of simultaneous administration of OPV and DPT; 82.7%, 57.2%, 46.2% and 26.8% children in groups I, II, III and IV respectively had received primary vaccination, the rates for regular vaccination being 60.0%, 35.1%, 29.0% and 14.0% respectively.

In this study, a positive correlation was noticed between the educational status of the parents and the immunisation rates in the children, and this was all the more conspicuous as far as the correct scheduling was concerned. The better immunisation practices observed in group II (the para-medicals) than in group III (the non-medical highly educated), despite the higher socio-economic status of the latter,

speaks for the highly favourable influence health education in particular.

#### References

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