Original Article

IMMUNIZATION STATUS OF SCHOOL CHILDREN OF INDORE HAILING FROM DIFFERENT SOCIOECONOMIC STATUS

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ABSTRACT

Background: Although the immunization coverage has increased over the past few years, school age is still a neglected area and accounts for high number of unimmunized children in developing world including India.

Objective: This study has been undertaken to determine the immunization status of school children in an urban locality of Indore, a district of central India; and to determine if parental socioeconomic status affect immunization coverage.

Material and methods: The study was school based cross-sectional, conducted in 50 schools of Indore district selected by random sampling. Children were between the ages of 5-16 years. Information was collected from parents by providing pre-tested proforma to the students.

Result: Only 54.3% of children included in the survey were fully immunized as UIP schedule, while the percentage of partially immunized and unimmunized children was 42.1 and 3.6%, respectively.

Conclusion: The percentage of vaccination was significantly proportionate to higher socioeconomic status (p –value <0.0001).

 Keywords: Immunization status, Adolescent immunization, School children, Socioeconomic status.

INTRODUCTION

Globally, each year 130 million children are born, 91 million of which are in the developing countries. However, around 10 million children under the age of five years die every year and roughly 3 million children die each year of vaccine preventable diseases (VPDs) with a disproportionate number of these children residing in developing countries.[1] The estimate for global child deaths under five years was 10.8 million in 2000. About 41% of these were in Sub-Saharan Africa and 34% in South Asia.[2]

Vaccines remain one of the most cost-effective public health initiatives,[3] yet the coverage against VPDs remains far from complete. Recent estimates suggest that approximately 34 million children are not completely immunized with almost 98 per cent of them residing in developing countries.[4] Vaccination coverage in India is also far from complete despite a longstanding commitment to universal coverage. A recent evaluation of VPD coverage in India found that 18 million children did not receive any coverage in 2001-2002.[5] While gain in coverage proved to be rapid throughout the 1980s, taking off from a below 20% coverage to about 60% coverage for some VPDs, subsequent gains have been limited.[6]

Given the extensive social benefits of immunization, any inequities in the knowledge, attitude and practices that leave out large

sections of the most deprived populations are a cause for serious policy concern. There is evidence of inequalities in immunization in India, despite the fact that childhood immunization has been an important part of maternal and child health services since the 1940s.[7] In spite of enthusiastic universal immunization program, we know that the number of beneficiaries is not up to the mark as the school age is still a neglected area.

The causes as to why immunization is not up to the mark need to be found. Therefore, this study was carried out in the school age children of Indore, the commercial capital city of the Madhya Pradesh, located in Central India, to know the immunization status of school going children and the effect of parental socioeconomic status on it.

MATERIAL AND METHODS

Indore is the largest city and commercial capital of the Indian state of Madhya Pradesh,[8] covering an area of 3,398 Km[2] and total population in 2001 was reported to be 2,465,827.[9] Males constitute 1,289,352 of the population and females 1,176,475. As per 2001 census, the city of Indore has an average literacy rate of 75.15%, higher than the national average of 59.5%.

STUDY PLACE:

As Indore is a modern city of Madhya Pradesh with diverse social characteristics, this survey was conducted in the school going children attending government, private and public schools to determine the effect of socioeconomic status on immunization. The study was carried out in the MR-10, Vijay Nagar and Palasia area (an urbanized locality) of the Indore district. There were about 90 government schools, 30 private and 18 public schools in the area. The schools are categorized accordingly:

Government School: The term "government school" refers to government-funded schools that are run by the government but does not include the government-aided schools that are privately managed.

Private schools: Government-aided schools that are privately managed.

Public schools: The "public schools" referred to in the rest of this study include recognized schools that charge fees and do not receive any

financial support from the government and is managed privately.

SAMPLE SIZE AND SAMPLING TECHNIQUE:

The study was a school based cross-sectional study conducted in 50 schools, which were selected randomly from 3 groups.

Inclusion criteria: All the children going to school, falling between 5-16 years of age were included in the study.

Exclusion criteria: All the children not coming within the age range were excluded from the study. Incompletely filled proforma were also not considered.

The schools covered include:
• Government schools =20
• Private Schools   =15
• Public schools   =15

A total of 5010 children in the age group of 5-16 years, 2024 children from government, 1541 children from private and 1445 children from public schools, were included in the study.

DATA COLLECTION TECHNIQUE AND TOOLS:

Data collection was carried out from November 2008 - August 2009.

Information was collected by providing pre-tested proforma and questionnaire to the students of each selected school.

Proforma contained the questions related to the preliminary information about the child viz. name, age, sex, religion, class, and parents name and their education, occupation, annual income and total family members, information regarding the immunization status of these children was collected (vaccines covered under UIP, EPI and IAP).

Fully filled proforma were collected and analyzed. Incomplete or partially filled proforma were excluded from analysis.

The socioeconomic status of the parents was determined using the Modified Kuppuswamy's scale.

DATA ANALYSIS:

As the study is school based including children in the age group of 5-16 years, parental recall and their response to the immunization status of children in the proforma was relied upon.

Some schools, in particular, public and private

school and some parents who had immunization cards available with them were relied upon.

After data collection, data was analyzed using SPSS 17 Software Package and Windows Excel Sheet. P value was generated, and a P value of < 0.05 was taken as significant and P value > 0.05 was taken as non-significant.

Following criteria for full, partial and no immunization was used:

Full Immunization: A child was considered fully immunized if vaccinated against BCG, 3 doses of OPV and DPT and 1 dose of measles as recommended in UIP.
Partial Immunization: A child was labeled as partially immunized if he/she had missed any one of the vaccines recommended in UIP.
Unimmunized: A child was labeled as unimmunized if he/she had not taken any of the vaccines.

OBSERVATIONS AND RESULTS

In the present study, 5010 children were included, of which 3025 (60.38%) were male and 1985 (39.62%) were female. 1445 (28.84%) children belonged to upper socio-economic

class, whereas 1541 (30.76%) and 2024 (40.4%) children belonged to middle and low socio-economic classes respectively.

Table 1: Socioeconomic (SE) Status of children surveyed

	Male	Female	Total	%
Upper SE class	856	589	1445	28.84
Middle SE class	901	640	1541	30.76
Low SE class	1268	756	2024	40.4
Total	3025	1985	5010	100

Table 2: Immunization Status (N=5010)

Immunization Status	Frequency	%
Fully immunized	2721	54.3
Partially immunized	2111	42.1
Unimmunized	178	3.6
Total	5010	100.0

In the present study, 2721 (54.3%) of children were fully immunized, 2111 (42.1%) children were partially immunized and 178 (3.6%) were unimmunized.

Table 3: Overall immunization status for each socioeconomic class

Population Particulars	Fully immunized (%)	Partially immunized (%)	Unimmunized (%)	Total (%)	p-Value
Upper Class	1020 (70.6)	425 (29.4)	0 (0.0)	1445 (100)	**p<0.0001**
Middle Class	730 (47.4)	788 (51.1)	23 (1.5)	1541 (100)	**Highly**
Lower Class	971 (48.0)	898 (44.4)	155 (7.7)	2024 (100)	**Significant**
Total	2721 (54.3)	2111 (42.1)	178 (3.6)%	5010 (100)	

The present table is depicting the association of socioeconomic class (Upper Class, Middle Class and Lower Class) of studied subjects with immunization status of their children of selected school of urbanized area of Indore city. The probability value of Chi-Square is 352.41 for 4 degrees of freedom which revealed a highly significant value (p<0.0001 two-tailed). Hence there is a highly significant association between socioeconomic classes and immunization status of their children. Therefore it is observed that there is no doubt in confirmation that socioeconomic status of studied subjects is highly influenced with immunization status of their respective children.

In the present study, full immunization coverage was highest for children belonging to

high socioeconomic class 1020 (70.6%) followed by children belonging to lower class 971 (48.0%) and then middle class 730 (47.4%). The lower class has more percentage of fully immunized children as compared to middle class children, the reason for which is unknown.

However, the overall immunization coverage status of middle class is much higher than that of low socioeconomic class.

Also in each class immunization coverage was higher in males as compared to females suggesting possible gender bias.

From the above table, it can be clearly seen that the P value for all vaccines is highly significant (< 0.001), suggesting that there is a direct association between socioeconomic status and

the vaccination coverage.

Table 4: Association of socioeconomic status with individual vaccine coverage

	Upper class	Middle class	Lower class	P value
BCG	93.2	79.4	83.6	<.001
DPT	80.3	68.2	62.4	<.001
OPV	100	90.95	89.35	<.001
Measles	93.9	71.7	68.6	<.001
MMR	79.3	49.1	44.6	<.001
Tetanus	74.2	35.3	31.1	<.001
Typhoid	65.5	30	23	<.001
Hepatitis-B	87.5	40.3	35.8	<.001
Hepatitis-A	16.4	0.4	0	<.001
Hib	19.8	0.4	0	<.001
Varicella	29.9	3.9	3.2	<.001
Pneumococcal	8.5	0	0	<.001
Rubella	6.4	0	0	<.001

DISCUSSION

Present study comprised of 5010 children out of which 3025 were male and 1985 female. Twenty eight point eight four percent (Total 1445; Male-856, Female-589) children belonged to high socio-economic class; whereas 30.76% (Total 1541; Male-901, Female-640) and 40.4% (Total 2024; Male-1268, Female-756) children belonged to middle and low socio-economic class respectively (Table 1). Out of these children 54.3% were fully vaccinated, while 42.1% were partially immunized and 3.6% were non-immunized (Table 2). Similar study done in M.P. by Yadav RJ, Singh P in the year 2004 showed 60.8% of children as fully immunized and 9.6% as non-immunized.[10] In a study carried in slums of Chandigarh in the year 2009 55% of children were fully immunized in the age group of 12-23 months[11]; another study done in slums of Surat in the year 2009 revealed only 25.5% of children as fully immunized (age group of 12-23 months) which is much less when compared with our study.[12] Our study includes school children (age group of 5 to 16 years). However, the data on immunization status in school-age is lacking at both the state and national level, so the exact scenario cannot be compared. National statistics (NFHS III) reveals fully immunized children as 40% in M.P.as compared to national coverage of fully vaccinated children of 44%.[13] On analyzing

these figures it is evident that immunization status of children including school children is far from satisfaction. Survey of beneficiaries from different areas and various age groups is needed.

It was further observed that children belonging to upper socio-economic class had higher immunization coverage (70.6%) as compared to children of same age group belonging to middle (47.4%) and low socio-economic class (48.0%). (Table 3) The difference is probably due to difference in attitude, awareness and affordability. It was also found that there was relatively less difference in the immunization of children belonging to low and middle socioeconomic classes (48% vs. 47.4% respectively). This may be due to the fact that with the improvement in educational status, the awareness about various private facilities increases and also the satisfaction with primary health care facilities decreases. There is also a possibility that people with higher educational status are economically well off and thus, have the resources to pay for the private services.

On analyzing the coverage of individual vaccine (Table 4), it was found that the coverage was maximum for OPV, then for BCG and minimum for rubella vaccine. The knowledge of the respondents of completely immunized children regarding BCG and OPV, and correct age of administration was quite impressive. After the administration of BCG and OPV at birth, the frequency of administration of other vaccines goes on decreasing. This could be attributed to the fact that the government policies and working of the healthcare system targets to reduce infant mortality rate with emphasis on prevention against six vaccine preventable diseases, so the parents are more concerned about the health of the newborn child and since BCG and OPV are the first vaccines to be administered, most of them get their children immunized with the vaccines and if not, they at least acquire the knowledge about it. However, beyond infancy the awareness and the interest of the community decrease, particularly in the school age group, depriving children from the benefits of other available vaccines. Hence, the awareness program and individual counseling needs to be stressed from healthcare system.

CONCLUSION

1. Although the immunization coverage has

increased over the past few years, in general, school age is still a neglected area and there is need to expand immunization program to school-age group. All important vaccines besides six emphasized, can be employed during this phase.

2. The use of optional vaccines (recommended) is more in upper socioeconomic class and middle socioeconomic class thereby suggesting the effect of socioeconomic class on use of optional vaccines.

3. Vaccination against rubella has been seen only in the upper socioeconomic class, where the affordability as well as awareness regarding vaccination is more. Education awareness and economic standards are important elements for broad coverage of immunization.

RECOMMENDATIONS

Following are the recommendations from the present study:

1. One of the reasons for dismal immunization coverage is highly focused attention seen on polio eradication at the cost of other program including immunization against other VPD's (Vaccine preventable diseases). An urgent need at present is to strengthen routine immunization coverage in the country with EPI vaccine. An equally pressing need at present is to include more vaccines in EPI. A rethink into the polio eradication strategy and appropriate introduction of inactivated polio vaccine in national immunization time table is also warranted.

2. In the last few decades there is an advent of many new vaccines in the private Indian market. However, most of these vaccines are at present accessible only to those who can afford to pay for them causing social inequality among children belonging to the underprivileged sections of the society. An additional stride step to extend the programme of immunization with lot of awareness programme and to spread the knowledge about newer vaccines should be taken.

3. For making vaccination cost effective, better immunization surveillance system is needed.

4. Immunization program has to be incorporated in school health programme. Further there is a need for coverage of dropouts and a systematic inclusion of adolescent immunization programme.

5. It is advisable to include topics on child health and immunization in school syllabus for improving the knowledge of future parents.

It is undoubtedly a difficult road ahead. A proactive approach is needed to ensure that Indian children are not deprived of immunization, one of the most cost effective public health strategies ever.

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