Original Article

Uptake of Newer Vaccines in Chandigarh

Sonia Puri, Vikas Bhatia, Amarjit Singh, H.M. Swami and Amrit Kaur

Department of Community Medicine, Govt. Medical College, College Building, Sector 32-A, Chandigarh, India.

ABSTRACT

Objective. To ascertain the uptake of newer vaccines in Chandigarh.

Methods. Uptake of newer vaccines was ascertained in underfive children through house to house survey during Jan 2004-Sep 2005 in sector 44 of chandigarh.

Results. Of 1031 children of the total urban population, More than 40% got immunised with newer vaccines. Maximum coverage was seen for Hepatitis B 461 (44.7%) for 3 doses followed by immunisation against Hib 287(27.8%). MMR vaccine coverage was 285 (27.6%). For typhoid and varicella coverage was less. More than 50% children got immunisation from private sector.

Conclusion. The newer vaccines are available in the market and being used by the people especially being catered by the private sector. **[Indian J Pediatr 2007; 74 (1) : 47-50]** *E-mail: soniagpuri@yahoo.com*

Key words : *Newer vaccines; Immunisation; Coverage*

Immunisation has been one of the greatest public health success. It has been now more than 25 years since EPI embarked upon immunization of children worldwide against six communicable diseases. Polio is on the verge of eradication and cases of neonatal tetanus have also declined. However now, scenario of immunisation is in for a major change in coming years. As many emerging and re-emerging diseases are now the significant contributor to childhood morbidity and mortality, viz hepatitis B, chickenpox, H. influenzae B, typhoid, hepatitis A, MMR etc.[1,2,3] Simultaneously, on the positive side, tremendous developments have taken place in the field of biotechnology. Newer vaccines are creating new choices and dilemmas. In addition, emergence of transnational organisations like Global Alliance for Vaccine Initiative in 1999, as a part of globalisation of health is exerting considerable pressure on developing countries to change their immunisation sechdule.[4]

Newer vaccines are being widely used in developed countries. While children in developing countries have access to 6-7 vaccines , in western countries they are getting 11-12 vaccines.[5]

Health being a state subject in India, some states have already introduced MMR and Hepatitis B vaccine in their immunisation sechdule,[6] while these are yet to be included in the national immunisation schedule. Many of the newer vaccines are also available in the market. These are also being regularly prescribed by the pediatricians, particularly in the urban area.

Hence, there is a need to develop a uniform policy for introduction and provision of the newer vaccines through government/private outlets. Against this background, present study was done to ascertain the uptake of newer vaccines in Chandigarh.

MATERIAL AND METHODS

Chandigarh, is one of the planned urban cities of India, with an area of 114 sq.Km. It has a population of about 1 million with nearly 50% population staying in urban developed sectors, 10% in rural areas and 40% in slums and resettled colonies. The city is well known for its modern architecture, excellent educational and health infrastructure with one of the highest literacy rate (81.6%).[7] The study was done in sector 44 (population – 16842), catered by Urban Health Training Centre (UHTC), of the Deptt of Community Medicine, Government Medical College and Hospital, Chandigarh (GMCH). The centre also caters to neighbouring slum (20,000), main sector population (15,000 – 20,000) and semiurban population (15,000- 20,000). The OPD attendance of UHTC is 90-100 patients daily. Usually 50% of them come from slum area, 20-25% from the main sector, 20% from

Correspondence and Reprint requests : Dr. Sonia Puri, Senior Resident, Department of Community Medicine, Govt. Medical College, College Building, Sector 32-A, Chandigarh - 160047.

semiurban area and 5% from other areas. The UHTC is located at a distance of 3kms from GMCH.

Owing to time and resource constraints the study was confined to the main sector population. The data collected for this study was a part of the baseline survey of the field practice area. An attempt was made to register all the children (0-5 years old) of the sector through house to house survey. No sampling was intended.

Out of the total sector population (16842 as per local enumeration Dec. 2004) 1031 children (M=574,F=457) were enlisted. Total number of houses so covered were 4218. Each floor of all the houses including servant quarters were visited. Each house was visited at least thrice before excluding it from study.

A pilot tested and pretested questionnaire was used for assessing the uptake of newer vaccines. Demographic characteristics- like age, sex, literacy of parents, religion and occupation were also noted. They were asked whether their children had received newer vaccines and about related details eg. age at vaccination, source of vaccination, place of immunisation and reasons for such choice. Questionnaire was prepared in English, Hindi and the native Punjabi language. A team of trained doctors and medical social workers collected this data by examining presence of scar of BCG, face to face interviews of mother/guardians and verification of immunization card. More than 80% of respondents had immunisation card. The immunisation data was then corroborated with the records of UHTC. This study was completed between Jan 2004-Sep2005.

Some chemist shops were also surveyed in the city to get data on availability and price of various vaccines.Few private pediatricians were also interviewed to get some insight into their vaccine prescription habit /pattern.

Statistical Analysis: For the analysis simple proportions, percentages were used

Ethical aspects: Consent of parents/guardians of the enlisted children was taken before the interview.

RESULTS

Out of the total sector population 16842(as per local enumeration Dec 2004), 1031 children(M=574, F=457) were enlisted. Majority of the sector population was from service class(government/private service and daily wagers comprising 76% of total population). Total number of houses so covered were 4218. No. of locked houses were 102, 182 mothers / guardians refused to participate in the study and 87 mothers and guardians were not available even after 3 follow up visits.

Out of total 1031, under five children, selected for the study 574(55.6%) were males and 457 (44.3%) were females. There were 426(41.3%) infants, 362(35.1%) of age group >1 yr - <2yr, 243(23.5%) of age >2yr-5Yr.

In Table 1, Age wise uptake of newer vaccines is illustrated along with routine vaccines (DPT and Measles). It was seen that 52.3%(461) and 48.8% (140) children were immunised against Hepatitis B and Hib in the first year followed by 39.5% (182) and 35.2% (101) in 2nd year. Similarly for Typhoid and MMR, uptake was 65.5% (19) and 79.3% (226) in age gp (13m-24m) and 34.5% (10) and 20.7% (59) in age gp more than 2 yrs - 5 yrs respectively. DPT and measles uptake too was more in 1st year as compared to 2nd year. 61.8% (612) and 58.9% (580) were immunised for DPT and OPV in first year followed by 32.3% (320) and 31.2% (307) in 2nd year Newer vaccines were usually taken from the private sector. 65.5% (302)

Table 1. Agewise Distribution of Children Who Had Received Various Vaccines

Age	DPT_3 (n=560)	Measles (n=985)	$Hepatitis_3$ (n=461)	Hib (n=287)	Typhoid (n=29)	MMR (n=285)	Varicella (n=62)
0-12m	612	580	241	140	-	-	-
(n=426)	(61.8)	(58.9)	(52.3)	(48.8)			
13-24m	320	307	182	101	19	226	44
(n=362)	(32.3)	(31.2)	(39.5)	(35.2)	(65.5)	(79.3)	(70.9)
25-60m	58	98	38	46	10	59	18
(n=243)	(5.9)	(9.9)	(8.2)	(16.0)	(34.5)	(20.7)	(29.03)

Table 2. Literacy of Mothers and Receipt of Various Vaccines by Children

Variable	No.	%	No. of Children Receiving Newer Vaccines				
			Varicella	MMR	Hepatitis	HIB	Typhoid
Literacy of Mother							
illiterate	118	11.4		22 (7.7)	59 (12.8)	23 (8.01)	-
1-5th	176	17		24 (8.4)	77 (16.7)	32 (11.1)	2 (6.9)
6-12th	279	27.1		66 (23.2)	113 (24.5)	59 (20.6)	3 (10.3)
Graduate	207	20.1	26 (41.9)	78 (27.3)	98 (21.3)	79 (27.5)	11 (37.9)
Post graduate	251	24.3	36 (58.6)	95 (33.3)	114 (24.7)	94 (32.7)	13 (44.8)
Total	1031		62	285	461	287	29

·Except for Hepatitis Vaccine the uptake of Newer Vaccines was significantly high(P<0.001) in higher literacy groups

TABLE 3. Recommended Age of Immunisation by Newer Vaccines and Their Cost

Vaccine	Recommended Age As per IAP Guidelines	Route of adm	Cost (Approx)
Hepatitis B	Birth, 6 & 14 Weeks or Birth, 1&6 months or 6,10 & 14 weeks	I/M	150/-
MMR	15 – 18 mths	S/C	60/-
Typhoid	>24 months + (Revaccination 3-4 years)	I/M	290/
Hib	6, 10 & 14 weeks, 15-18 months	I/M	450/-
Chickenpox	>12 mths	S/C	1300/-

children were immunised for Hepatitis in private sector and 44.9% (129)_ for Hib. In case of Typhoid none of the children were immunised in Govt sector. Same trend was for MMR and varicella. 55.8% (159) in case of MMR & 91.9% in case of varicella were immunised in private sector

Table 2 shows that uptake of all-newer vaccines was significantly more in children of literate mothers as compared to illiterate. Similar trend was observed in case of families with educated fathers. Uptake of six vaccine preventable diseases included in the national immunisation schedule was BCG (994,96.4%), DPT and OPV (990, 96.0%) and Measles (986, 95.6%). Among the newer vaccines, maximum uptake was of hepatitis B (461, 44.7%) followed by Hib (287, 27.8%). Uptake of Typhoid and Varicella was less i.e. 62(6.01%) and 29 (2.8%) respectively. It was found that due to lack of awareness of correct schedule of newer vaccines and cost factor, many parents did not get their child immunised with all the recommended doses. Drop outs were more in case of Hib vaccine as compared to hepatitis B. Drop out rate between 1st and 3rd dose in Hib was 23.6% (89) as compared to hepatitis B 4.94% (24).

DISCUSSION

Of late, privatisation has been the dominant agenda as far as proposed changes in health care delivery in India are concerned. Gradually the burden of the payment of medical care is being shifted to the patients. However, the primary prevention activities like immunisation of mother and children are still sought to be retained in public sector. So, it is expected that in near future also the immunisation services for the masses in India will still be delivered through government system. However, the national immunisation schedule itself is likely to be thoroughly revised.

In the wake of emerging new communicable diseases, it is natural that immunization needs of children are dynamic. A vaccine which may not be considered important today may become necessary later on. Hence, immunisation schedule of a country should be reviewed periodically to adjust itself to the current immunization requirements of the children.[8] In India also such a review is being done. It has been suggested by IAPCOI (Indian Academy Of Pediatrics committee on Immunisation) that NIS should be supplemented by newer vaccines Hepatitis –B, MMR, and Typhoid[9] (Table 3). But for other vaccines like Varicella it stated that it may not be included at present and may be offered to children from high socio-economic status after explaining the pros and cons on one to one basis.[10,11] For HIB vaccine cost seems to be most prohibitive for its inclusion.[12, 13]

Most of the private pediatricians in urban India are prescribing newer vaccines. Now, even in government hospitals people do inquire about these vaccines.They are willing to get their child vaccinated on their own in private hospital. In the authors study uptake by newer vaccines was estimated to be more than 40% where as it was more than 95% for routine NIS vaccines.

The present study shows that parents in Chandigarh are aware of newer vaccines. Availability and affordability of them in private sector is not a problem. Hence, it is thus right time to modify the national immunisation sechdule to incorporate these vaccines. Because, this will help in making them available to masses. If this is not done and current scenario of their availability in private outlets is continued then rich –poor health gap will further increase. This is because the rich and urban population will continue to get the newer vaccines. Consequently, their children will become immune to the concerned disease whereas children from poor strata will become even more vulnerable as they will eventually constitute pockets of susceptible hosts interspersed with their immune rich counterparts.

Thus, it appears that a Change in immunisation sechdule is inevitable in India. Such schedules are being expanded to include combination vaccines or new vaccines all over the world. Newer vaccines are being used in developed countries.In developing countries also these are gradually penetrating into the national immunisation programmes. Hepatitis B vaccine, is now a part of the immunisation pragramme of 153 countries up from 12 in 1990.[14] In India, national capital territory of Delhi incorporated HB vaccine in its immunisation programme in 2001.[15, 16] In the same year Andhra Pradesh included it in its state immunisation sechdule. In June 2002,[17] Government of India, also initiated the incorporation of HB vaccine as a universal vaccine through a pilot project. It was introduced in 15 cities and 32 districts in the initial phase. It is envisaged that HB vaccine will be introduced in all districts of India by 2007.[18, 19] However, it's formal inclusion in NIS is yet to be declared.

Higher uptake of newer vaccines in children of literate mothers as reported in the present study may be because literacy is also a proxy measure of socio-economic status. So both awareness about the availability and importance of newer vaccines along with affordability in families with better literacy level might have affected the uptake. This

association was not observed for HIB vaccine probably because vigorous campaign were launched in recent past for this, in Chandigarh as well as other parts of India. So, outreach was possibly extended to even poor families. The present study also reported that among the newer vaccines the uptake of Hepatitis vaccine was maximum i.e more than 40%. The main factor for its maximum uptake and awareness could be attributed to the fact that in institutional deliveries especially in private sector, it is given at birth along with BCG. Moreover many campaigns for hepatitis B vaccine were organised in recent past. Hence people have to know about this vaccine.

GAVI aims to provide support to poor countries for introduction of newer vaccines.[20, 21] Prevailing opinion among experts favours inclusion of HB , MMR and HIB vaccine in NIS of India. Introduction of Hib vaccine is currently on the GAVI agenda. So far 92 countries have introduced but, it is likely to be eighth vaccine to be included in the world health organisation immunisation programme. It was found in the present study that nearly 1/3rd of people have opted for Hib vaccine.[22]

MMR vaccine is another vaccine that is cheaper[23, 24] and given to all children at 15-18 m of age in Chandigarh, also an immunisation drive was launched by Department of Family Welfare, to immunise school going girls by Rubella vaccine free of cost. The present study showed the uptake to be somewhat same as that of Hib 27.64%. Typhoid and varicella coverage was found to be less than 10%.

Thus, the present study, documents that newer vaccines are used by the public at large. However, no uniform immunisation schedule is being followed for these vaccines. Standard guidelines are not available. Individual practitioners are using their own regimens. This may lead to incomplete vaccination owing to lack of awareness of the people about the number of required doses.

CONCLUSION

Authors present study gathered data on the history of receipt of newer vaccines. The study does not attempt to calculate coverage rates. It only documents that newer vaccines are available in the market and are being used by people at large.

REFERENCES

1. www.immunisationinfo.org
2. www.childrensvaccine.org
3. www.who.int/Vaccines
4. Editorial. Vaccine Eloquent-spaced Out. *Down to Earth* 2006; 36-42.
5. Bellamy C. Child Health. In R. Detds *et al* eds. *Oxford Textbook of Public Health*, Vol. 3. The Practice of Public Health, 4th eddition. Oxford university press, 2002; 1605-1622.
6. Kiran V. Hepatitis B vaccine introduction in to the routine immunization schedule – Andra Pradesh experience. *Indian J Public Health* 2004; 62-66.
7. *Census of India, Series – 1,* Registrar General & Census Commissioner 2001.
8. IAP guide book on *Immunization* 2003; 38.
9. Parthasarathy A, Dutta AK, Bhave SY. IAP guide book on immunization committee on immunization. *Indian Academy of Pediatr* 2001; 48.
10. Bhave Y. Swati. Controversies in chicken pox immunization. *Indian J Pediatrics* 2003; 503-506.
11. Halloran ME, Cochi SL, Live TA, Wharton M, Fetrs L *et al.* Theoretical epidemiologic and morbidity effects of routine varicella vaccine of preschool children in united states. *Am J Epidemiol* 1994; 140 : 81-104.
12. Nitin K. Shah H. influenza type b (Hib vaccine). *Indian Pediatr* 2003; 489-493.
13. John TJ, Cherian T, Raghupathy P *et al.* H. influenza disease in children in India a hospital perspective. *The Paediatr Infectious d/s Journal* 1998; 17 : 5169-5171.
14. Introduction of Hepatitis B vaccine into childhood immunization programs from department of vaccine and biological *WHO* Geneva 2001.
15. Miller Mark A, Kane Mark. Routine hepatitis B immunization in India- cost effectiveness assessment. *Indian J Pediatr* 2000; 67 : 299-301.
16. Gomber S, Sharma R. Immunogencity of hepatitis B vaccine in the expanded program of immunization schedule. *Indian Pediatr* 2000; 37 : 411-413.
17. Cooley Laura. Andra Pradesh Builds a model immunization system Indian State protects millions and shows what new vaccine and technology can do. *Indian J Public Health* 2004; 67-69.
18 Mittal S K. Hepatitis B Vaccine In the EPI-Is it required. *Indian J Pediatr* 2001; 68-72.
19. Mittal SK, Rao S. Hepatitis B vaccination in EPI. *Trop Gastroenterol* 1998; 88-99.
20. Balaji KA. GAVI and the vaccine fund – A boon for immunization in the developing World. *Ind J Public Health* 2004; 45-48.
21. www.vaccinealliance.org
22. Levine OS, Kane M, Pierce NF. Development, Evaluation and implementation of HIB vaccines for young children in developing countries-Current status and priority actions. *Pediatr Infect Disease Journal* 1998; 17 : 95-113.
23. Dubey AP, Banerjee S. Measles, Mumps and Rubella vaccines. (Symposium on controversies in Immunization-II). *Indian J Pediatr* 2003; 579-84.
24. Makala A, Pekka, Neuroti J, Peltola H *et al.* Neurologic disorders after Mealses, Mumps, Rubella vaccination. *Pediatrics* 2002; 40 : 957-963.