Epidemiologic Consequences of Moderate Coverage Levels of Measles Vaccine in a District Headquarter Town (Alwar) in India, 1996

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Summary

This paper describes the epidemiology of measles in a medium size town (population 240,000) in India where vaccine coverage levels have remained constant at around 70 per cent in the past 7 years. A retrospective community survey covering 4023 children under 10 years old detected 252 cases of measles in the previous year. This gave an annual incidence of 6.3 per cent (95 per cent CI 5.5–7). About half of the cases occurred in vaccinated children. Only 5 per cent of the cases occurred in children below 9 months of age. This age is appropriate for routine measles immunization. Despite modest coverage levels with only 54 per cent effective vaccine (estimated by a screening method), there was a modest upward shift in the age distribution of measles cases; the median age was more than 48 months.

Introduction

Several studies were carried out in the pre-immunization era to understand the epidemiology of measles in India. These studies have been reviewed recently. There are, however, scanty data on the epidemiologic consequences of the vaccination programme in different settings. The purpose of this paper is to describe the impact of the vaccination programme on the epidemiology of measles in a typical district headquarter town in India.

Patients and Methods

Alwar town has a population of about 240,000 which is distributed in 50 recently reorganized wards. A community survey was organized in six randomly selected wards in December 1996. Senior physicians went from house to house to interview the mothers (or head of the family) for history of measles in children below 10 years of age in the previous year. Data on age of occurrence of measles and vaccination were collected for all cases. The measles vaccination status of other children was also recorded. A record or convincing history of immunization was the criterion used to categorize a child as vaccinated. The surveyors used the WHO standard case definition of measles as well as their clinical skills to elicit the history of measles.

In addition, routine surveillance data on measles cases and vaccine coverage from Alwar town were also analysed.

Results

Measles vaccine was introduced into the district immunization programme in 1986. Reported coverage levels increased rapidly to almost 100 per cent by 1990; coverage levels ranged between 64 per cent and 84 per cent during 1992–5. A routine surveillance system reported only nine cases of measles in Alwar town during 1992–6.

Surveyors detected 252 cases of measles in 4023 children under 10 years old which gave an annual incidence of around 6.3 per cent (95 per cent CI 5.5–7). Table 1 describes these cases by age and vaccination status. The median age was more than 48 months. Only 5 per cent of cases occurred in children below 9 months of age; all these cases occurred in those aged 6–8 months. Almost half of the cases occurred in vaccinated children.

Overall vaccination coverage in children aged 9 months or more was about 68 per cent. However, only a third of 9–11-month-old infants had received measles vaccine. The vaccine coverage levels have remained constant over the past 6–7 years. Interestingly, about 4 per cent of infants were vaccinated before 9 months of age.

Acknowledgements

We gratefully acknowledge the participants of the First Regional Field Epidemiology Training Programme, National Institute of Communicable Diseases (NICD), Delhi, for field work and data collection. We also thank the Chief Medical and Health Officer and Principal Medical Officer, Alwar for their cooperation in data collection. Assistance of the staff of FPU, NICD Alwar Branch is also acknowledged.

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The results show the annual incidence of measles in Alwar town to be 83 (95 per cent CI 70–96) and 63 (95 per cent CI 55–70) per 1000 children under 5 and under 10 years old, respectively. In 1981, a study estimated the incidence in the same area to be 125 (95 per cent CI 109–141) per 1000 children under 5 years. Thus, between 1981 and 1996, measles incidence fell by 34 per cent in children under 5 years old.

About 68 per cent of children aged 9 months or more were found to be vaccinated against measles. The vaccine coverage levels were almost similar in all age cohorts after 1 year of age (Table 2). Programme managers envisage immunizing children against measles at the earliest recommended age (9 months in India) to get the maximum benefits. However, only 34 per cent of 9–11-month-old infants had been immunized. On the other hand, about 4.4 per cent children were vaccinated before 9 months of age, when the vaccine is comparatively less effective due to the presence of maternal antibodies. These are areas of concern which need to be addressed if the effectiveness of the vaccination programme is to be maximized.

Almost half of the cases occurred in vaccinated children. Using the data on the proportion of cases and population vaccinated, we estimated vaccine effectiveness to be only 54 per cent by a screening method. About 68 per cent coverage levels with a 54 per cent effective vaccine would protect around 37 per cent of children against measles. If we consider only children aged 9 months to 4 years, this figure comes to around 39.5 per cent. This compares well with the estimated percentage drop (34 per cent) in the incidence of measles in children under 5 in Alwar town during 1981–96.

Only 5 per cent of the measles cases occurred in children below 9 months of age. This age is therefore appropriate for routine measles immunization. Despite modest coverage levels with only 54 per cent effective vaccine, about 40 per cent of cases occurred in children 5 years and above; the median age was more than 48 months. Analysis of line lists on measles cases treated in the local district hospital during 1995–6 also showed similar results; of 88 cases, 38 per cent were 5 years and above. Although data on age distribution of cases in Alwar town in the pre-immunization era are not available, these data are consistent with the findings of other studies that showed a sharp rise in older age groups of children in the post-immunization era.
available, results obtained from a recent review on age distribution of measles cases in different settings in India indicate a modest upward shift in the age distribution of measles cases in the study area. Interestingly, a change in the age at onset of measles with moderate vaccine coverage levels has not been seen in more dense and larger populations with almost similar levels of vaccination coverage, but was reported in an area with a population similar to that of Alwar. Thus, epidemiologic consequences of vaccinations are not the same in different settings.

Finally, the routine surveillance system reported only nine cases of measles (no deaths) from Alwar town during 1992–6. In contrast, about 3400 cases were estimated to occur every year according to survey results. Although many mothers do not bring their sick children to health facilities because of traditional beliefs and attitudes regarding measles, information was lost within the health system also; most of the cases treated in the local district hospital were not reported through routine surveillance system. An excellent surveillance system is essential to monitor progress, estimate vaccine effectiveness, identify problems, and direct programme activities to the areas of greatest need. This study underscores the need to take steps in this direction.

References

Findings of Colonoscopy in Children: Experience from Kuwait

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Summary
This report summarizes our retrospective analysis of 173 colonoscopic examinations performed on 159 children over a period of 9 years in Kuwait. Ninety-six children were males, with a male to female ratio of 1.5:1. The main indications for colonoscopy were rectal bleeding, polyps, and suspected inflammatory bowel disease. Examination was done under sedation or anaesthesia. One hundred and fifty-one (87 per cent) examinations were complete up to the caecum and 89 (51 per cent) up to the terminal ileum. The most common pathology was polyps in 42 children. All but one polyp were hamartomatous and mainly localized to the rectum and sigmoid colon. The majority had a single polyp. One child had adenomatous polyposis coli. One hundred and forty-two polyps were removed endoscopically with no complications. Inflammatory bowel disease was present in 34 (21 per cent) children (17 Crohn's disease, 11 ulcerative colitis, and 6 indeterminate colitis). Tuberculosis of the ileo-caecal region was diagnosed in two cases. Seven patients had rectal ulcers presenting as rectal bleeding. In 11 (7 per cent), the lesions were limited to the right side of the colon or terminal ileum. These results suggest that colonic pathology is not uncommon in children in Kuwait. The disease...