Letters to the Editor

Prior use of killed vaccine as a factor in measles incidence in Canada

From FRANKLIN WHITE

Sir—The article by Duclos et al. on measles in adults in Canada and the United States, is a useful but incomplete analysis of the differences between two national experiences. They utilize a broad proportional morbidity analysis to compare measles age distributions ≥20 years for the 15-year period 1980 to 1995, and relate this to programmatic differences. However, a more rigorous analysis is warranted, in light of an underlying factor in Canadian rates which is not addressed by the authors.

The missing factor, in reference to the Canadian experience, is the extended use of killed measles vaccine from the mid 1960s to around 1970, a formulation that was both low in efficacy and prone to set up susceptibility for atypical measles syndrome (a symptomatic immune response on exposure to wild measles virus). This vaccine was taken off the market in the US after about one year of unsatisfactory use, but remained in active use in Canada for about 4 years, particularly in Ontario and Alberta.

In 1983, it was estimated that there were 750 000 children in Canada (then mainly teenagers) who had received killed measles vaccine, a number almost double that of an entire Canadian birth cohort. The same group today would range in age from 30 to 35 years. A proportional morbidity analysis to compare two countries over a 15-year period 1980–1995 will not detect this effect. Use of a broader age group 30–39 years, as the authors have done, will further dilute it. However, analysis of 5-year age cohorts, in relation to their lifetime experience of measles may detect it. It is noteworthy that a major epidemic of measles took place in Canada in the mid 1980s, shown without comment by the authors in their Figure 2, although there was no parallel occurrence in the US. The killed measles vaccine cohort would have been in their late teens and early 20s at that time.

My suggestion to the authors is to carry out an age-specific cohort analysis, with Ontario and Alberta as subsets, to see whether there is a cohort effect for this particular age group, who may have impaired immunity to measles on a lifelong basis. This analysis may throw some additional light on the international comparison, but is even more important to assess within the Canadian experience itself. More than simply a matter of epidemiology, the question has ethical and programmatic implications for immunization policy.

References


Authors’ Response

From P DUCLOS, SC REDD, P VARUGHESE, BS HERSH AND J WATERS

Sir—In his letter, Franklin White raises the issue of prior use of killed vaccine in selected Canadian Provinces as a factor in measles incidence in Canada. Indeed, the majority of cases in the 1979 epidemic occurred as atypical measles syndrome among recipients of killed vaccine administered in the late 1960s. In the province of Alberta where killed vaccine was extensively used, the rate reached a high 502 per 100 000 population. Since the mid 1980s, however, epidemics have not been related to use of this inactivated vaccine. In the 1986 outbreak, none of the provinces experiencing major epidemic measles had used killed measles vaccine in their vaccination programme.

In Canada, there has been a long-standing recommendation that people previously immunized with the inactivated measles vaccine be revaccinated with the live attenuated vaccine. We believe that the combination of exposure to natural measles and revaccination have virtually wiped out the pool of susceptibles from prior receipt of inactivated vaccine. In all most recent and well-documented cases this indeed was no longer an issue to the extent that the recommendation of revaccination of people previously vaccinated with the inactivated vaccine no longer appears in the current version of the Canadian Immunization Guide since as of now this was deemed to be no longer a relevant recommendation.

With respect to data further analysed by province and smaller age groups, one is facing the issue of small numbers and inherent variability. The proportion of measles cases occurring in

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populations 20 years of age and over since 1969 and its evolution for Alberta, the province which experienced the largest proportional use of inactivated measles vaccine, does not significantly differ from other provinces. Historical data by 5-year age groups in the older ages is unfortunately not available in Canada and does not allow for a specific exploration of differences for the age group 30–35 years. Yet as pointed out in our article, between 1980 and 1995, a total of 73.3% of cases occurring in populations 20 years and over did occur in people younger than 30 years of age and did indeed represent the bulk of the problem. Finally, there is a steady decrease in incidence in older age groups which does not seem to suggest a particular cohort effect in the 30–35 year age group.

We therefore consider the distant and differential use of inactivated measles vaccine in Canada and the US of no impact both on the current measles situation among adult populations or to explain differences between the US and Canadian situation. It would be incorrect to believe that this would in any way alter our previous conclusions.

References