Letters

Vaccine-associated paralytic polio in India

Editor – K.A. Kohler et al. have interpreted the risk of vaccine-associated paralytic poliomyelitis (VAPP) in India to be lower than elsewhere by using the number of doses of oral polio vaccine (OPV) as the denominator, instead of the population at risk itself (*1*). While risk against doses was a reasonable approach when doses were limited to 3 or 4 per child and the total number proportional to the number of infants born, this approach is no longer valid in countries like India. For example, in 1999, 125 million children under 5 years of age consumed 733 million doses of OPV — an average of 6 doses per child in 1 year (*1*). In the previous 3 years, their 3 routine doses plus 2 campaign doses would add up to 5, 7 or 9 doses for 1, 2 or 3–4 year-olds, respectively (*1*). Thus, by 1999, most of them would have received 11–15 doses. It was the inflated denominator that made the risk of VAPP appear misleadingly low (*1*).

Each year, 25 million babies are born in India and the important question is: how many of them will eventually develop VAPP? In 1999, there were 181 cases of VAPP among children under 5 years old. If a similar number of VAPP cases occurred each year, then the risk of VAPP would be 7 (181/25) per million, or 1 per 143 000 infants born. In comparison, the risk of VAPP was only 1 case per 750 000 immunized infants in the USA (*2*), 1 per 400 000 in Norway (*3*), and England and Wales (*4*). Therefore, the risk of VAPP in India is not reduced but increased, when measured against the population at risk instead of against the number of doses given.

The World Health Organization's (WHO) Technical Consultative Group (TCG) on the Global Eradication of Poliomyelitis has suggested a rate of 1 case of VAPP per million births and has estimated the annual global burden of VAPP to be approximately 120 cases (*4*). Under these circumstances, India's share would only be 25 cases, based on the annual birth cohort of 25 million. The observed number of 181 cases indicates that the actual risk is 7 times the expected number (*4*).

As the risk of poliomyelitis due to wild polioviruses was not uniform among countries during the pre-vaccination era, the risk of VAPP also varies geographically — as seen in India and other countries used in comparison (*1*). A rule of thumb has emerged to estimate the burden of VAPP in different countries exclusively using OPV: namely, the number of VAPP cases would be lower than wild-virus polio cases by a factor of approximately 1000–1500. In the past, India would annually register some 200 000 cases of polio (*5*). By using the rule of thumb estimate, VAPP prevalence would be between 130 and 200 cases. In the USA, the annual average number of polio cases in the pre-immunization era was approximately 10 000–12 000 while the annual average of 8–10 cases of VAPP during the OPV era (*2*) illustrates a reduction in cases by a factor of 1000–1500. While it has been estimated that there were some 600 000–800 000 cases of poliomyelitis annually in developing countries during the pre-immunization era, it is reasonable to assume that there would be presently 400–800 annual cases of VAPP. In the past, approximately a quarter of wild-virus polio used to occur in India and today a quarter of VAPP in India would equal 100–200 cases, fitting well with the observed number of 181.

In light of the increased risk of VAPP in India, the TCG will have to revise its estimate of the global burden of VAPP (*4*) and explore the possibility of replacing OPV with inactivated polio vaccine in order to avoid VAPP. In scientific and ethical terms, eradication must result in the total absence of poliomyelitis due to any polioviruses, wild or vaccine-related (*6*). ■

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