

Measles Vaccine Deaths— The IAP-COI Stand

On April 23, 2008, four children died soon after receiving measles vaccine stored in ice boxes in vaccination camps in two villages in Thiruvallur district of Tamil Nadu. As per parents and other eye witnesses, all children developed frothing at the mouth, drooping of the head, rolling of eye balls and died within 15 - 20 minutes of vaccination. No resuscitative equipment was available on site(1). This event created a lot of panic amongst parents and pediatricians about the safety of vaccines particularly measles. The IAPCOI attempts to discuss the possible causes for serious adverse reactions following immunization (AEFI) in the backdrop of this unfortunate event. The objective is to reassure pediatricians about vaccine safety, counsel them about best practices related to immunization and finally to ensure that immunization coverage does not dip.

POSSIBLE REASONS

Faulty vaccine is the first thought that comes to the mind. However in the present case, almost 20,000 doses of the same batch were administered to children in that area on the same day with no other casualties(2). If the vaccine was faulty more casualties could be expected. Also, subsequent analysis of vaccine vials of the same batch has shown them to be of standard quality thus ruling out this possibility(3).

Anaphylaxis to the vaccine is another possibility worth considering. The incidence of anaphylactic or severe allergic reactions to vaccines is very low, less than one case per million vaccine doses(4). The cause of the reaction is usually not the immunizing antigen itself, but rather some other vaccine ingredient such as egg protein from the production process or gelatin added as a stabilizer. Subject of allergic reactions to vaccines containing egg protein has been well studied and it is clear that vaccines containing egg protein are safe even in children with egg allergy. Majority of vaccines presently contain only trace of egg protein. In contrast, there is little knowledge about allergy to other substances such as

gelatin and others. One fourth children with anaphylactic reactions to MMR vaccine in USA have been found to have high levels of anti-gelatin IgE antibodies(5). In highly allergic children, one in ten dilution of vaccine is administered intradermally to check for anaphylaxis(6). Since in most children it is impossible to predict the likelihood of anaphylaxis, it is crucial that knowledge and equipment for resuscitation is available at any center where vaccines are administered. In the current case, it is highly unlikely that all four children died on the same day in the same locality due to an extremely rare event such as anaphylaxis.

Toxic shock syndrome has been reported in the past as a cause of serious adverse events and even death following vaccination with measles vaccine(7,8). It is reported with multi dose vials of vaccines that have been stored after reconstitution beyond the recommended time of 3-4 hours. These vaccine vials act as culture media for bacteria chiefly exotoxin producing *S. aureus*. Toxic shock syndrome may also occur following use of unsterile syringes or needles. Symptoms occur within a few hours after vaccination and consist of fever, vomiting, diarrhea, shock and finally death within 24 hours. In the current case, toxic shock syndrome is a strong possibility. However, symptoms in the current case began almost immediately following vaccination which is unusual for toxic shock syndrome.

Accidental dilution of lyophilized vaccine with another drug such as succinylcholine/pancuronium instead of the diluent has been associated with measles / BCG vaccine related deaths in the past(8). In this eventuality, symptoms occur almost immediately following vaccination and consist of hypotonia, cyanosis, dyspnea, hypersalivation and immediate death. In the current case scenario, symptoms of affected children were similar. However, the event happened in a camp where the vaccine and diluent were carried in a cold box rather than in a PHC where mix up between drugs can happen. Moreover the nurse said that the diluent though supplied was of a manufacturer different from that of the vaccine itself but was measles vaccine diluent all right(9).

CONCLUSIONS AND RECOMMENDATIONS

The real cause for vaccination related deaths in Tamil Nadu may never be known as the incriminated vial is not available for analysis. However, they appear to be due to human error and eminently preventable. It also appears that it would have been possible to resuscitate the affected children had resuscitative equipment and knowledge been available at site. Pediatricians should make all attempts to allay anxiety of parents regarding vaccine safety. They should make all attempts to maintain cold chain, keep resuscitative equipment on stand by and discard any left over vaccine beyond the recommended time of administration.

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