

ROTAVIRUS VACCINES

Use

Rotavirus infection is a ubiquitous, worldwide, cause of diarrhoea, killing many third-world children. Two very effective oral vaccines came onto the market in 2006. Neither seems to cause intussusception in the way the first licensed vaccine (Rotashield[®]) was found to do in 2001. Unfortunately the communities most in need of the protection that these new vaccines can provide are the communities least able to afford their cost.

Rotavirus diarrhoea

Rotaviruses were first discovered, using the newly invented electron microscope, in 1973, and it soon became clear that almost every child becomes infected with this virus at least once in the first 5 years of life. The peak age for infection is 3–30 months, and most infection is caused by the oral intake of faecal contaminants, although respiratory (aerosol) spread is not that uncommon. Young and malnourished children are always the most seriously affected, and half a million children are currently thought to die in the world each year from rotavirus infection. Although a wide range of serotypes exist there is good evidence that children who have had one infection are much less likely to become ill when later exposed to a different strain, suggesting that natural infection triggers strong cross-immunity.

Rotavirus infection currently kills half a million children in the world every year, and seems to be responsible for more than a third of all hospital admissions caused by diarrhoea. Take care not to overlook a surgical cause if there is abdominal pain, distension, a mass, or bilious vomiting. Suspect bacterial rather than viral infection if there is high fever, and a Shiga toxin producing *Escherichia coli* or *Shigella dysenteriae* infection if there is bloody diarrhoea. Children unable to take an oral rehydration solution (q.v.) need hospital care.

An attenuated monovalent live human rotavirus vaccine (Rotarix[®]), when tested in a trial involving 20,000 children in Latin America and Finland, reduced serious rotavirus gastroenteritis by 85% and 'all cause' gastroenteritis by 40%. A pentavalent bovine-human vaccine (RotaTeq[®]) proved at least as effective when tested on 68,000 American and European children, and in no study to date has there any excess of small bowel intussusception. It is not possible to say whether one vaccine is better than the other because no direct head-to-head comparison has yet been done. The pentavalent vaccine is more consistently excreted in the stool and may, therefore, confer greater 'herd' immunity. Neither vaccine has yet been tested in a community where the G2[P4] strain is prevalent, so it is not yet certain how either product will perform in this situation. Studies in Asia, where this strain is more commonly seen, may help to resolve this uncertainty.

Indications

Because infection is particularly dangerous in a very young child, the logical time to start immunisation is 6–8 weeks after birth. Because of lingering concern that intussusception might still be a problem, the American vaccine is currently only licensed for use children less than 8 months old. There is no evidence that administration has to be delayed or avoided because of preterm birth.

Contraindications

Give thought to the balance of risk before giving either vaccine to a child with gastrointestinal symptoms, or to a child who is in close contact with an immunodeficient person. There is not yet enough information to recommend administration to a child with symptomatic or asymptomatic HIV infection.

Interactions

Other intramuscular paediatric vaccines can be given safely and effectively at the same time as an oral rotavirus vaccine. Giving this vaccine within two weeks of the oral polio vaccine has not yet been studied.

Administration

Rotarix: Give two doses by mouth at least 4 weeks apart. The first dose can be given 6 weeks after birth.

RotaTeq: Give three doses by mouth (at 2, 4 and 6 months). The first dose should be given 6–12 weeks after birth, and other two doses should then be given 4–10 weeks apart. Do not repeat if spat out.

Supply

Rotarix: This product from GSK, which has so far been licensed for use in Europe and 33 countries in Latin America, Africa and Asia, comes as a lyophilised powder that need to be stored at 2–8°C and reconstituted with buffered diluent. Vials (with a syringe containing 1 ml of the necessary diluent) cost £41 each.

RotaTeq: This American product from Merck, comes as a buffered pale yellow liquid in 2 ml ready-to-use, squeezable, plastic dosing tubes that cost \$55 each. Store and transport at 2–8°C and protect from light.

References

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