



Rotavirus Gastroenteritis (RVGE) – An underestimated disease

Rotavirus is the most common cause of severe dehydrating diarrhoea in children worldwide and causes half a million deaths every year in children less than five years old. In the European Union, it is estimated that each year 87,000 hospitalisations and

| Rotavirus – impact on infant health | |
|---|---------|
| No. of deaths per year worldwide | 600,000 |
| In the European Union: | |
| - No. of hospital visits per year | 87,000 |
| - No. of doctor visits per year | 700,000 |
| - Percentage of gastrointestinal hospitalisations | 50% |

over 700,000 doctor visits to children under five years of age are due to RVGE. In total an estimated 3.6 million of the 23.6 million children under five years of age suffer from RVGE in the European Union each year¹.

An unavoidable disease

Studies of prevalence of RVGE by age confirm that infants can be infected at an early age^{2,3} and many will be infected with rotavirus by two to three years of age, some more than once by five years of age and sometimes with more than one infection per year. The majority of children will be infected between 6 to 24 months of age at a time where they are particularly vulnerable to disease. Rotavirus is very contagious. 10 virus particles per millilitre can be sufficient for infection - compared to the 10,000,000,000 virus particles per millilitre of stool shed by an infant when infected by a natural occurring Rotavirus.

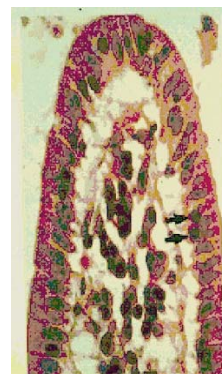
Rotavirus is highly resistant to its environment. It can survive for weeks in water and is resistant to most soaps and disinfectants. The virus easily spreads by direct contact with an infectious subject (faecal-oral transmission) but can also be transmitted through respiratory secretions and contact with items that have been contaminated by an infectious person, such as food, water and toys, and perhaps through respiratory secretions. High rates of infection can occur even in the most sanitary conditions. The incidence of rotavirus is similar in industrialised and developing countries, which suggests that differences in environment (e.g. hygiene and access

An unpredictable disease – in terms of severity

The severity of rotavirus infection ranges from asymptomatic forms to severe gastroenteritis with a dramatic loss of body fluid (dehydration) that can be fatal. The typical symptoms are watery diarrhoea, vomiting, fever and abdominal pain. They are non-specific; they are the same as for any other gastroenteritis. More than 20 diarrhoea or vomiting episodes in 24 hours are not uncommon, with diarrhoea lasting three to nine days. In a large epidemiological study conducted in seven European countries, RVGE led more often than other gastroenteritis to diarrhoea, vomiting and to fever⁴. There is no way to predict the evolution of the symptoms and the severity of the disease, and a seemingly mild RVGE can deteriorate and require medical intervention. According to European studies, up to 50% of gastroenteritis-associated hospitalisations in children less than five years of age were due to rotavirus⁵, and it is usually the very youngest infants that are most severely affected⁷.

Rotavirus infection

Rotavirus infections causes an inflammation of the cells that line the interior of the gut. Finger-like projections, called villi, are responsible for the absorption of food products. Rotavirus infection interferes with this process and the damage to the villi can be seen under the microscope. There are several types of rotavirus that circulate at the same time. Their proportion fluctuates unpredictably from country to country and also from season to season. However, the four rotavirus types G1P[8], G2P[8], G3P[8] and G4P[8], caused the majority of rotavirus disease worldwide between 1973 and 2003⁶.



Normal villus



Infected villus

The G9P[8] rotavirus has recently emerged as a fifth important type. In a large epidemiological

study conducted in seven European countries, these

rotaviruses found in the stool samples of infected children⁴.

A disease that can be prevented by vaccination

There has been until now no real way to prevent rotavirus infection in children. The symptoms of RVGE can be treated with supportive care, based on the replacement of lost body fluid (re-hydration), by mouth (orally) with oral re-hydration solutions. However, when a child is vomiting oral re-hydration is often difficult to administer, and re-hydration directly through the veins (intravenous) in hospital may be required.

Vaccination is recognised as one of the control measures that can have a significant impact on the incidence of severe RVGE, and can provide early protection, which is of particular relevance to young children who are more prone to develop severe disease⁷.



A photomicrograph of rotaviruses



References

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Rotavirus gastroenteritis is now a vaccine preventable disease.

Two new vaccines have been licensed in the European Union in 2006.

These vaccines have been shown to be effective against the disease, not only in preventing up to 90% of severe cases, but also in dramatically reducing hospitalisations due to rotavirus gastroenteritis and need for medical interventions.

Both vaccines are given by mouth and indicated from the age of 6 weeks.

Extensive clinical studies involving more than 70,000 babies have demonstrated the safety of the vaccines.

Austria is the first European country to recommend universal vaccination of infants against rotavirus and other EU member states are now considering such vaccination policies

Did you know that:

▶ The name rotavirus comes from the Latin word "rota" for a wheel since the virus has a distinct wheel-like shape.

▶ A rotavirus is 70 nm. To put this into perspective, the difference in size between a viral particle and a flea would be same as that between a person and a mountain twice the size of Everest

▶ Rotavirus has been shown to be one of the most common causes of nosocomial or hospital acquired infections. These may result in a longer stay in hospital, may require re-hospitalisation, or ward closures if an epidemic occurs.

▶ Rotavirus infection usually peaks in winter. This puts additional burden on the health services during this busy period.

EVM member companies : Baxter, Berna [Crucell], GSK Bio, Novartis, Sanofi Pasteur, Sanofi Pasteur MSD, Solvay Pharmaceuticals, Wyeth.

For further information on EVM visit our website at www.evm-vaccines.org