Vaccination against Rotavirus - the use of Rotarix® vaccine
An update for registered healthcare practitioners

Version 2.1 December 2013
Background

In July 2013 a new vaccine, will be introduced into the childhood immunisation schedule, this will protect infants against the most common strains of rotavirus. Rotavirus is the commonest cause of gastroenteritis among children and results in a significant number of young children being admitted to hospital each year. The vaccine which will be used for this programme is called Rotarix®.

In 2009, the JCVI (Joint Committee on Vaccination and Immunisation) considered the evidence on a) the burden of rotavirus infection and b) the cost effectiveness of rotavirus immunisation. Based on the available evidence JCVI advised that the licensed rotavirus vaccines would have a significant impact on reducing gastroenteritis in young children, and that the UK health departments should introduce the vaccines if they could be procured at a cost effective price. This advice was reiterated in 2011 following consideration of a further cost effectiveness study.

In November 2012, Scottish Government announced that the vaccine had been procured at a price which meant the programme would be cost effective. It has now been confirmed that the programme will start on 1 July 2013.

Rotavirus

What is rotavirus?

Rotavirus is a highly infectious virus which causes gastroenteritis and is the commonest cause of gastroenteritis among young children. Infections are often recurrent. Most children will experience at least one or more rotavirus infection by five years of age.

Rotavirus infection causes gastroenteritis that usually lasts from three to eight days.

Gastroenteritis can cause dehydration, which can be very serious especially in young infants requiring hospitalisation for intravenous rehydration. It is estimated that 1200 children under five are admitted to hospital each year in Scotland because of rotavirus infection.

Rotavirus is highly infectious, and spread is mainly via the faecal-oral route.

Who is affected by rotavirus?

Rotavirus can affect people of all ages, but the highest incidence is in young children. It is estimated that rotavirus infections cause around half of all gastroenteritis in children less than five years of age.

As mentioned previously young infants are also more likely to suffer from dehydration if they become infected with rotavirus than older children or adults.
The rotavirus vaccination programme

Is Scotland the only country introducing the rotavirus vaccine?
The rotavirus vaccination programme will be introduced in all parts of the UK. Rotavirus vaccination is also part of the routine infant immunisation programme in a number of other countries including Australia, Canada and USA. In the USA, studies have shown that rotavirus related hospital admissions for young children have been cut by more than two thirds since rotavirus vaccination was introduced.

Does the vaccine protect against all causes of gastroenteritis in young children?
The Rotarix® vaccine protects against the most common strains of rotavirus. It doesn’t protect against other types of virus (i.e. norovirus) or bacteria (i.e. Salmonella) that can cause gastroenteritis. However, as rotavirus is the most common cause of gastroenteritis in young infants, it will have a significant impact on the total number of young children who become ill with gastroenteritis and the number with severe disease.

How many doses will infants receive?
The objective of the programme is to provide two doses of Rotarix® to infants before 24 weeks of age (i.e. 23 weeks and 6 days). Infants will be offered two doses with an interval of at least four weeks between doses, at 8 weeks (2 months) and again at 12 weeks (3 months). It is preferable that the full course of two doses of Rotarix® be completed before 16 weeks but must be completed by 24 weeks (i.e. 23 weeks and 6 days).

When will infants receive the vaccine?
- All children scheduled to receive their primary vaccines at age 8 weeks and 12 weeks should be offered the rotavirus vaccine, that is, two doses, four weeks apart. Both doses should be given by 24 weeks of age (i.e. 23 weeks and 6 days).
- Infants who have received their first dose of vaccine by week 15 (i.e. 14 weeks and 6 days) can receive their second dose of Rotarix® as long as it is given by week 24 (i.e. 23 weeks and 6 days).
- Infants who have not received their first dose by 15 weeks of age (i.e. 14 weeks and 6 days) should not be commenced on Rotarix®.
- Infants may receive their first dose of primary immunisations from 6 weeks of age in exceptional circumstances e.g. pre-travel but it is not routinely recommended to offer infants vaccine before 2 months of age. Rotarix® is licensed from 6 weeks of age.
What if the infant does not receive the first dose at age 2 months?

If the infant presents before they are 15 weeks of age (i.e. 14 weeks and 6 days) then they should be offered their first dose. The second dose should be given at least four weeks later and must be given before 24 weeks of age (i.e. 23 weeks and 6 days).

Infants who present for their first dose after 15 weeks of age (i.e. 14 weeks and 6 days) should not be offered Rotarix®.

What if it is more than four weeks since the first dose?

If the course is interrupted, it should be resumed but not repeated. Provided the second dose can be given before the 24 week cut off.

Why can’t the first dose of vaccine be given to children over 15 weeks?

Vaccination should not be initiated after 15 weeks of age (i.e. 14 weeks and 6 days) (this is in line with recommendations from WHO).

As they get older, some infants (about 120 per 100,000) develop intussusception a naturally occurring condition. The background risk of intussusception increases to peak at around 5 months of age. Research from some countries suggests that Rotarix® may be associated with a very small increased risk of intussusception within seven days of vaccination, possibly two cases per 100,000 first doses given. The benefits of vaccination in preventing the consequences of rotavirus infection outweigh this small potential risk in young children. Because of the potential risk, and to reduce the likelihood of a temporal association with rotavirus vaccine, the first dose of vaccine should not be given after 15 weeks of age.

Infants who receive the first dose before week 15 should have their second dose four weeks later, and before 24 weeks (i.e. 23 weeks and 6 days).

If the first dose of rotavirus vaccine is inadvertently given to a child age 15 weeks 0 days or older, what advice should be given and should the child still receive a second dose four weeks later?

Children who inadvertently receive the first dose of rotavirus vaccine at age 15 weeks or older should still receive their second dose at least four weeks later - providing that they will still be under 24 weeks of age at the time. The reason for the 15 week age limit is to minimise a potential risk of intussusception.

No specific clinical action needs to be taken if the first dose of vaccine is inadvertently given after 15 weeks and zero days of age or if the second dose is given after 24 weeks of age. For both situations, immunisers should be reminded of the age restrictions for Rotarix®, even if infants are unable to start or complete the two dose schedule as a consequence of these restrictions.
The vaccine

What vaccine is being given?
The vaccine that will be used is Rotarix®. It is a live attenuated vaccine (a weakened form of virus which cannot cause disease in the infant but which protects against rotavirus).

This is an oral vaccine which must not be injected.

As described previously the Rotarix® vaccine is already in use in a number of other countries

How should the Rotarix® vaccine be stored?

Rotarix® must be stored in accordance with the manufacturer’s instructions. As with most vaccines Rotarix® should be stored in a refrigerator between +2°C and +8°C.

The vaccine should be stored in the original packaging. This makes it easy to identify in the vaccine refrigerator and will protect from light.

How is the vaccine presented?

• The vaccine is presented as a prefilled oral applicator containing 1.5ml oral suspension.
• It is ready to use (no reconstitution or dilution is required).
• It is a clear, colourless liquid, free of visible particles.
• It should be visually inspected for any foreign particulate matter and/or abnormal physical appearance. In the event of either being observed, discard the vaccine.
How is the vaccine given?

- Give the oral Rotarix® vaccine at the beginning of the visit, before administration of any intramuscular vaccines which may unsettle the infant.
- The infant should be seated in a reclining position.
- Remove the protective tip from the oral applicator.
- Administer orally (i.e. into the child's mouth, towards the inner cheek) the entire content of the oral applicator.
- The vaccine must not be injected.

What happens if the baby spits the vaccine out?

If the infant spits out or regurgitates most of the vaccine, a single replacement dose may be given at the same visit.

Can the baby be fed before or after receiving the vaccine?

Yes, there are no restrictions on the infant's feeding before or after immunisation.

Can Rotarix® be given at the same time as other vaccines?

Rotavirus vaccine can be given at the same time as the other vaccines administered as part of the routine childhood immunisation programme, including BCG, and so should ideally be given at the scheduled two month and three month vaccination visits. However, rotavirus vaccine can be given at any time before or after the routine infant immunisations and at any time before or after BCG vaccine. The recommendation for administering live vaccines either at the same time or after an interval of four weeks only applies to injectable live viral vaccines and, therefore, not to BCG or to the oral rotavirus vaccines.5

As discussed previously it is suggested that Rotarix® is given at the beginning of the visit, before administration of intramuscular vaccines which may unsettle the infant.
As Rotarix® is a live vaccine, can it be passed onto others?

There is a potential for transmission of live attenuated virus in Rotarix® from the infant to severely immunocompromised contacts through faecal material for at least 14 days. However, vaccination of the infant will offer protection to household contacts from wild-type rotavirus disease and outweigh any risk from transmission of vaccine virus to any immunocompromised close contacts.

Those in close contact with recently vaccinated infants should observe good personal hygiene e.g. washing their hands after changing a child's nappy.

Are there any infants who can’t have Rotarix®?

Although the vaccine is a live attenuated virus, with the exception of severe combined immune-deficiency (SCID), the benefit from vaccination may exceed any risk in other forms of immunosuppression. Therefore, there are very few infants who cannot receive rotavirus vaccine. Breast feeding and medications for gastro-oesophageal reflux are not contraindications for rotavirus vaccination. The rotavirus vaccine can also be administered before, at the same time as, or after administration of any blood product, including those containing antibody/immunoglobulin. Where there is doubt, appropriate advice should be sought from an immunisation coordinator or consultant in health protection rather than withholding vaccination.

Rotarix® should not be given to:

- infants with a confirmed anaphylactic reaction to a previous dose of rotavirus vaccine,
- infants with a confirmed anaphylactic reaction to any components of the vaccine,
- infants with a previous history of intussusception,
- infants aged 24 weeks of age or over (i.e. beyond 23 weeks and 6 days)
- infants presenting for the first dose of vaccine over 15 weeks of age (i.e. beyond 14 weeks and 6 days)
- infants with severe combined immunodeficiency disorder (SCID)
- infants who have a malformation of the gastrointestinal tract that could predispose them to intussusception
- infants with rare hereditary problems of fructose intolerance, glucose-galactose malabsorption or sucrase-isomaltase insufficiency

Administration of rotavirus vaccine should be postponed in infants:

- suffering from acute severe febrile illness. This is to avoid confusing the diagnosis of any acute illness by wrongly attributing any signs and symptoms to adverse effects of the vaccine.
- suffering from acute diarrhoea or vomiting. This is to ensure that the vaccine is not regurgitated or passed through the intestines too quickly, which could reduce the effectiveness of the vaccine.
Can the vaccine be given to children who are immunocompromised?

Rotavirus vaccine should not be administered to infants known to have severe combined immunodeficiency disorder (SCID). There is a lack of safety and efficacy data on the administration of rotavirus vaccine to infants with other immunosuppressive disorders. Given the high risk of exposure to natural rotavirus however, the benefits of administration is likely to outweigh any theoretical risks and therefore should be actively considered, if necessary in collaboration with the clinician dealing with the child's underlying condition.

From clinical trials with HIV infected infants, the safety profile was similar between Rotarix® and placebo recipients. Therefore vaccination is advised in HIV infected infants. Additionally infants with unknown HIV status, but born to HIV positive mothers should be offered vaccination.

Can premature infants receive the vaccine?

It is important that premature infants have their immunisations at the appropriate chronological age, according to the schedule. Vaccination of preterm infants using Rotarix® is indicated at a chronologic age (without correction for prematurity) of at least six weeks, if the infant is clinically stable. As the benefit of vaccination is high in premature and very premature infants, vaccination should not be withheld or delayed.

Very premature infants (born ≤ 28 weeks of gestation) who are in hospital should have respiratory monitoring for 48-72 hrs when given their first immunisations, particularly those with a previous history of respiratory immaturity. If the child has apnoea, bradycardia or desaturations after the first routine immunisation, the second immunisation should also be given in hospital, with respiratory monitoring for 48-72 hrs.

As the benefit of vaccination is high in this group of infants, vaccination should not be withheld or delayed.

Can Rotarix® be given to infants who are in a neonatal unit?

Administration of rotavirus vaccine to hospitalised infants, including preterm infants in neonatal units, is likely to carry a low risk for transmission of the vaccine virus if standard infection control precautions are maintained. Furthermore, the rotavirus vaccine is highly attenuated and does not revert to a high virulence strain. Therefore, provided that the infant is clinically stable, vaccination should not be delayed, particularly if the delay risks being too late to give the vaccine or giving the first dose of vaccine closer to the upper age limit of 15 weeks. Similarly, if a recently vaccinated child is hospitalised for any reason, no precautions other than routine standard infection control precautions need to be taken to prevent the spread of vaccine virus in the hospital setting.
If the child has already had rotavirus infection can they still receive the vaccine?

If a child has had confirmed or suspected natural rotavirus infection they should still receive the Rotarix® as scheduled, to provide protection against future infection.

If the child is suffering from acute diarrhoea or vomiting the administration of the rotavirus vaccine should be postponed. This is to make sure that the vaccine is not regurgitated or passed through the intestines too quickly, which could reduce the effectiveness of the vaccine.

**Does Rotarix® contain thiomersal?**

No, there is no thiomersal or any other preservatives in Rotarix®.

**Does Rotarix® contain latex?**

The plunger stopper and protective tip cap are both rubber butyl, which should not affect latex sensitive individuals.

**What are the potential side effects of this vaccine?**

The most common adverse events observed following the administration of Rotarix® are:

- diarrhoea
- irritability

Other reactions commonly reported are:

- vomiting
- abdominal pain
- flatulence
- skin inflammation
- regurgitation of food
- fever
- loss of appetite

The full list of adverse reactions associated with Rotarix® is available in the marketing authorisation holder’s Summary of Product Characteristics.⁶
Anaphylaxis

As with all vaccines, there is a very rare possibility of this vaccine causing a severe allergic reaction called anaphylaxis. All registered healthcare practitioners responsible for immunisation should be trained to recognise and treat anaphylaxis.

Parents/guardians should be advised to seek medical advice if there is any severe adverse event.

Is there a link between rotavirus vaccine and intussusception?

Research from some countries suggests that Rotarix® may be associated with a very small increased risk of intussusception within seven days of vaccination, possibly 2 cases per 100,000 first doses given, and the Rotarix® prescribing information includes this as a possible side effect. The benefits of vaccination in preventing the consequences of rotavirus infection outweigh this small potential risk in young infants. 5

Because of the potential risk, and to reduce the likelihood of a temporal association with rotavirus vaccine, the first dose of vaccine should not be given after 15 weeks of age.

Parents/guardians should be advised to contact the doctor immediately if the infant develops severe vomiting abdominal pain and pass what looks like red current jelly in their stools.

What is intussusception?

Intussusception is a naturally-occurring condition of the intestines, with a background annual incidence of around 120 cases per 100,000 children aged under one year. Intussusception occurs when a section of the bowel folds in on itself, like a telescope closing. When this occurs, it creates a blockage in the bowel.

The main symptom of intussusception is severe abdominal pain that comes and goes. Each episode tends to last 2-3 minutes in between episodes the infant will look very pale, tired and floppy.

After the 12 hours or so the pain becomes more constant and the infant will usually go off food and may vomit. Due to vomiting the infant may become dehydrated.

The child may also have a high temperature and a swollen stomach. The child’s faeces may contain blood and mucus.9

Intussusception can be life threatening and requires prompt medical treatment.
Where can I get more information?

The CMO letter
http://www.show.scot.nhs.uk/publications/publication.asp

The Green Book chapter

The HPS/NES training slides

Marketing authorisation holder's Summary of Product Characteristics
http://www.medicines.org.uk/emc/medicine/17840/SPC/Rotarix

Commission on Human Medicines (CHM) – for reporting adverse reactions
http://www.mhra.gov.uk/yellowcard

More information on the clinical presentation of rotavirus from NHS Inform
http://www.nhsinform.co.uk/health-library/articles/r/rotavirus-gastroenteritis/symptoms
References


