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EPAR summary for the public

Synflorix

Pneumococcal polysaccharide conjugate vaccine (adsorbed)

This is a summary of the European public assessment report (EPAR) for Synflorix. It explains how the Agency assessed the medicine to recommend its authorisation in the EU and its conditions of use. It is not intended to provide practical advice on how to use Synflorix.

For practical information about using Synflorix, patients should read the package leaflet or contact their doctor or pharmacist.

What is Synflorix and what is it used for?

Synflorix is a vaccine that contains parts of the bacterium *Streptococcus pneumoniae* (*S. pneumoniae*, also called pneumococcus). It is used to protect infants and children aged between 6 weeks and 5 years against invasive disease, pneumonia (infection of the lungs) and acute otitis media (infection of the middle ear) caused by *S. pneumoniae.* Invasive disease results from the bacterium spreading through the body causing serious infections such as septicaemia (blood infection), meningitis (infection of the membranes around the brain and spine) and pneumonia.

How is Synflorix used?

Synflorix is available as a suspension for injection. It can only be obtained with a prescription.

The vaccination schedule for Synflorix depends on the age of the child and should be based on official recommendations.

- Infants aged between 6 weeks and 6 months are given a course of three doses with an interval of at least one month between each dose, with the first dose usually given at 2 months of age. A fourth ('booster') dose is recommended at least 6 months after the third dose, preferably when the child is between 12 and 15 months of age.
- When Synflorix is given as part of a routine infant immunisation programme (when all infants in an area are vaccinated at around the same time), a course of two doses may be given 2 months

7 Westferry Circus ● Canary Wharf ● London E14 4HB ● United Kingdom
Telephone +44 (0)20 7418 8400 **Facsimile** +44 (0)20 7418 8416
E-mail info@ema.europa.eu **Website** www.ema.europa.eu
An agency of the European Union

apart, from the age of 6 weeks, followed by a booster dose at least 6 months later. However, children aged under 6 months with conditions that make them more likely to catch these invasive diseases, such as those with human immunodeficiency virus (HIV) infection, sickle cell disease or spleen problems, should be given three doses followed by a booster dose.

- Premature babies (born between 27 and 36 weeks gestation) are given a course of three doses with an interval of at least one month between each dose, with the first dose given at 2 months of age. It is recommended that a booster dose be given at least 6 months after the third dose.
- Infants aged between 7 and 11 months are given a course of two doses with an interval of at least one month between them. It is recommended that a booster dose is given at least 2 months after the second dose, during the child's second year of life.
- Children aged between 12 months and 5 years are given a course of two doses with an interval of at least 2 months between them.

The vaccine is given by injection into the thigh muscle in infants or into the shoulder muscle in young children.

How does Synflorix work?

Synflorix is a vaccine that protects against infections caused by *S. pneumoniae*. Vaccines work by 'teaching' the immune system (the body's natural defences) to defend the body against the infection. When a person is given the vaccine, the immune system recognises the parts of the bacterium in the vaccine as 'foreign' and makes antibodies against them. The immune system will then be able to produce antibodies more quickly when it comes into contact with the bacterium again. This helps to protect against the disease.

Synflorix contains small amounts of polysaccharides (a type of sugar) extracted from the 'capsule' that surrounds the *S. pneumoniae* bacterium. These polysaccharides have been purified, then conjugated (attached) to a carrier to help them to be recognised by the immune system. The vaccine is also adsorbed (fixed) onto an aluminium compound to stimulate a better response.

Synflorix contains the polysaccharides from ten different types of *S. pneumoniae* (serotypes 1, 4, 5, 6B, 7F, 9V, 14, 18C, 19F and 23F). In Europe, it is estimated that these are responsible for 56 to 90% of the cases of invasive disease caused by *S. pneumoniae* in children under the age of 5 years.

What benefits of Synflorix have been shown in studies?

Synflorix was evaluated in a large study involving over 30,000 infants below 7 months of age who were given either Synflorix or a comparator vaccine which was not active against *S. pneumoniae.* The children were followed up for an average of around 2 years. Synflorix was effective in protecting against invasive disease: no cases were seen among the 10,000 children given three doses of Synflorix and a booster dose, one case occurred among the 10,000 children given two doses of Synflorix and a booster dose and 12 cases occurred in 10,000 children given the comparator vaccine.

Synflorix was also investigated in a large study involving around 24,000 children aged between 6 and 16 weeks that focussed mainly on the vaccine's benefit in preventing community acquired pneumonia. The children in this study were given either Synflorix or a comparator vaccine which was not active against *S. pneumoniae* and were followed up for an average of 30 months. The percentage of children who had bacterial pneumonia was 2.3% (240 out of over 10,000) among those given Synflorix compared with 3% (304 out of over 10,000) among those given the comparator.

Another main study looked at whether Synflorix prevents acute otitis media. The study involved almost 5,000 infants aged 3 months and compared an investigational vaccine that contains the same polysaccharides as Synflorix with another vaccine that is not active against *S. pneumoniae* (in this case, a vaccine against hepatitis A virus). The children were followed up until the end of their second year of life. The occurrence of the first episode of acute otitis media caused by *S. pneumoniae* was approximately halved among children who were given the investigational vaccine compared with those given the comparator. Based on a comparison of the immune response of Synflorix with the investigational vaccine used in the study, Synflorix is expected to provide similar protection against acute otitis media caused by *S. pneumoniae*.

The ability of Synflorix to trigger the production of antibodies (immunogenicity) was assessed in one main study involving 1,650 healthy infants aged between 6 and 12 weeks. The study compared the immunogenicity of Synflorix with that of another vaccine that is authorised in the EU to protect children against *S. pneumoniae* infection, and which contains seven of the ten polysaccharides in Synflorix. Synflorix was as effective as the comparator in triggering the production of antibodies against five of the polysaccharides that the two vaccines shared in common (4, 9V, 14, 18C and 19F), but it was less effective than the comparator for two (6B and 23F). For the three additional polysaccharides (1, 5, 7F), Synflorix was effective in triggering the production of antibodies.

Additional studies looked at the effects of booster vaccinations and vaccinations in older infants and children. The studies showed that Synflorix led to an increase in antibody production following booster vaccinations. In particular, two clinical studies in children aged 2 to 5 years investigated the ability of Synflorix to produce antibodies in this age group compared with other age groups. The children received one dose of Synflorix in the first study and two doses in the second study. The response to Synflorix in 2 to 5 year olds was similar to the younger age group, with better results in children who received two doses. In studies in infants and older children, although Synflorix produced a lower antibody response than the comparator vaccine, it fulfilled pre-defined criteria and was considered acceptable in this group.

What are the risks associated with Synflorix?

The most common side effects with Synflorix (which may affect more than 1 in 10 people) are pain, redness and swelling at the injection site, fever, drowsiness, irritability and loss of appetite. The majority of these reactions were of mild to moderate severity and were not long lasting. For the full list of side effects with Synflorix, see the package leaflet.

Synflorix must not be used in children who have a high fever, but it can be given in children who have a mild infection such as a cold. For the full list of restrictions, see the package leaflet.

Why is Synflorix approved?

The European Medicines Agency noted that the immune system's response to Synflorix was comparable to its response to another vaccine, which is also authorised for the protection of children against *S. pneumoniae* in the EU. The Agency also noted that Synflorix contains additional polysaccharides from the types of *S. pneumoniae* that are responsible for disease in Europe and therefore decided that Synflorix's benefits are greater than its risks and recommended that it be given marketing authorisation.

What measures are being taken to ensure the safe and effective use of Synflorix?

Recommendations and precautions to be followed by healthcare professionals and patients for the safe and effective use of Synflorix have been included in the summary of product characteristics and the package leaflet.

Other information about Synflorix

The European Commission granted a marketing authorisation valid throughout the European Union for Synflorix on 30 March 2009.

The full EPAR for Synflorix can be found on the Agency's website: ema.europa.eu/Find medicine/Human medicines/European Public Assessment Reports. For more information about treatment with Synflorix, read the package leaflet (also part of the EPAR) or contact your doctor or pharmacist.

This summary was last updated in 11-2017.