

Guidelines for the prevention and treatment of infection in patients with an absent or dysfunctional spleen

Health Service Executive – Southern Area

Fulminant, potentially life threatening infection is a major long-term risk after splenectomy. Most instances of serious infection are due to encapsulated bacteria such as *Streptococcus pneumoniae* (pneumococcus), *Haemophilus influenzae* type b (Hib) and *Neisseria meningitidis* (meningococcus). Other infections that may have serious consequences include malaria, babesiosis, which is associated with tick bites, and *Capnocytophaga canimorus*, which is associated with dog bites.

Asplenic children under 5 years have an infection rate of over 10%, much higher than in adults (<1%). Though most infections occur within the first two years of splenectomy, up to a third may be manifested at least five years later. Cases of fulminating infection have been reported more than 20 years after splenectomy. Children with sickle cell anaemia are at especially high risk of overwhelming infection.

All patients who have had splenectomy for any reason should be told that there is a small risk of very serious infection and about the precautions that are needed to decrease this risk. It is important that people with asplenia are aware of the signs and symptoms of meningitis and of the need for immediate treatment.

International guidelines have been produced for the prevention and treatment of infection in patients with an absent or dysfunctional spleen. These guidelines highlight the importance of preventative measures for postsplenectomy sepsis and recommend specific immunisations and antibiotic prophylaxis.

Immunisations

It is important that people with asplenia realise that immunisation does not give complete protection.

Pneumococcal immunisation

The Immunisation Guidelines for Ireland (2002 Edition) recommend pneumococcal vaccine for use in persons who are at increased risk of pneumococcal disease and its complications, especially those with asplenia or severe dysfunction of the spleen, including surgical splenectomy.

At present two vaccines are available in Ireland.

1. Polysaccharide Pneumococcal Vaccine. It contains the 23 most prevalent or invasive pneumococcal serotypes. Most healthy adults develop a good antibody response to a single dose of the vaccine by the third week following immunisation. Overall vaccine efficacy in preventing severe pneumococcal infection is probably 60-70%.

The vaccine is not recommended for children under two years of age, as it is poorly immunogenic in this age group

2. A conjugate 7 valent vaccine has recently been licensed for use in at-risk children aged under two years of age. It has enhanced immunogenicity compared with the polysaccharide vaccine, even in infancy. It is active against approximately 70% of isolates causing invasive disease.

This vaccine should be used for children under 2 years as per schedule below.

Vaccination schedule for conjugate pneumococcal vaccine

Age at 1 st vaccination	Primary series	Booster
2-6 months	3 doses at 4-8 week interval	1 dose at 12-15 months
7-11 months	2 doses at 4-8 week interval	1 dose at 12-15 months
12-24 months	2 doses at 4-8 week interval	

Those who have received conjugate vaccine should be given the polysaccharide vaccine after the age of two years, at least eight weeks after their last dose of conjugate vaccine.

The vaccine should be given a minimum of two weeks before elective splenectomy in order to ensure an optimal antibody response. If this is not possible the patient should be immunised as soon as possible after recovery from the operation and before discharge from hospital.

Unimmunised patients who were splenectomised some time earlier should be immunised at the first opportunity.

Immunisation should be delayed for at least six months after immunosuppressive chemotherapy or radiotherapy.

There is some doubt about the duration of efficacy of the vaccines, particularly in immunocompromised persons. A single revaccination with the polysaccharide vaccine may be employed for those at highest risk of disease after an interval of greater than five years.

Side effects of immunisation are usually self-limiting. Localised tenderness and erythema at the injection site may occur. Occasionally there may be low grade fever lasting less than 24 hours. Refer to the vaccine data sheet for contraindications and further details.

The general practitioner should be informed of the splenectomy and immunisation.

An increased number of isolates of pneumococci with multiple antibiotic resistance has highlighted the importance of prophylaxis in at-risk individuals.

Meningococcal immunisation

The Immunisation Guidelines for Ireland (2002 Edition) recommend that those with functional or anatomical asplenia should receive one dose of MenC conjugate vaccine. The need for additional doses in high risk groups has not yet been established and will be kept under review.

Licensed conjugate (MenC) and polysaccharide A+C vaccines are available in Ireland.

Meningococcal C conjugate (MenC) vaccine

Immunisation with MenC conjugate vaccine became part of the routine schedule of infant immunisation in the Republic of Ireland from October 2000. MenC is given at the same time as primary immunisation with DTaP, Hib and IPV at two, four and six months. Unvaccinated children aged 12 months and over and adults only need one dose.

A “catch-up” programme of immunisation commenced in October 2000, under which MenC vaccine was offered to everyone up to and including 22 years of age.

Plain polysaccharide meningococcal vaccine (Group A+C)

Meningococcal polysaccharide vaccine is effective against serogroups A and C organisms. However, young children respond less well than adults, with little response to the Group C component below 24 months and little response to the Group A component below three months. The immunity induced by this vaccine is of short duration.

Quadrivalent polysaccharide vaccine (Group A,C, Y+W135)

There is a quadrivalent polysaccharide vaccine, which protects against Group A, C, W135 and Y organisms. It is currently not licensed in Ireland.

Patients travelling to a high risk area for meningococcal infection will still require the additional protection conferred by polysaccharide A+C or quadrivalent (A,C,Y+W135). If subsequent vaccination with these vaccines is required for travel purposes an interval of at least two weeks after administration of MenC vaccine should be left before administration of the polysaccharide vaccines.

Redness, swelling, tenderness/pain are common injection site reactions following the MenC vaccine. A low grade fever is also frequent. Refer to the vaccine data sheet for contraindications and further details.

In Ireland meningococcal infection is most commonly due to Group B strain for which there is no vaccine available. It is important that people with asplenia are aware of the signs and symptoms of meningitis and of the need for immediate treatment.

Hib immunisation

The Immunisation Guidelines for Ireland (2002 Edition) recommends Hib vaccine for “persons with functional or anatomical asplenia, irrespective of age”.

The conjugated Hib vaccine was introduced into the childhood immunisation programme in Ireland in October 1992. Since that time most infants will have received Hib vaccine.

There are data to suggest that a single dose of Hib vaccine is immunogenic in splenectomised adults. Those under one year should be given three doses. At present, there is no data to indicate a need for further booster doses.

When splenectomy is performed electively, the vaccine should ideally be given at least two weeks earlier. If this is not possible the patient should be immunised as soon as possible after recovery from the operation and before discharge from hospital.

Swelling and redness at the injection site have been reported at a rate of up to 10%. Refer to the vaccine data sheet for contraindications and further details.

Influenza immunisation

The Immunisation Guidelines for Ireland (2002 Edition) strongly recommend influenza vaccination for adults and children with “immunosuppression due to disease or treatment, including asplenia or splenic dysfunction”. Remember annual immunisation is necessary, ideally in September/October each year.

Antibiotic Prophylaxis

Studies on antibiotic prophylaxis have shown a benefit when used in children with sickle cell disease who have functional asplenia. The recommendation in the UK is to maintain these children on prophylaxis until they are 16 years. The American Academy of Paediatrics recommends stopping antibiotics at 5 years provided there is no history of invasive pneumococcal disease and the child has been vaccinated. Since most cases of overwhelming sepsis occur within 2-3 years of splenectomy, several sources recommend that chemoprophylaxis be given for at least that period. If patients have an underlying immunocompromised state, antibiotics should continue indefinitely.

Antibiotics recommended for prophylaxis are penicillin, amoxycillin or erythromycin in the case of penicillin allergy. Penicillin is the antibiotic of choice in children as amoxycillin may be less well tolerated. The advantages of amoxycillin over penicillin in adults are that it is better absorbed as an oral preparation, it has a broader spectrum and a longer shelf life.

Chemoprophylaxis is recommended for asplenic patients in the following circumstances:

- Children up to the age of 16 years
- Post splenectomy for at least 2-3 years
- Indefinitely for patients with an underlying immunocompromised state and asplenia.

Antibiotic Dosage for Prophylaxis

Penicillin

Adult	250-500mg 12 hourly
Child aged 5-14 years	250mg 12 hourly
Child under 5 years	125mg 12 hourly

Erythromycin (base)

Adult and child over 8 years	250-500mg daily
Child aged 2-8 years	250mg daily
Child under 2 years	125mg daily

Amoxycillin

Adult	250-500mg daily
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In addition, for patients not allergic to penicillin, a supply of amoxycillin should be kept at home (and taken on holidays) and used immediately should infective symptoms develop. Medical help should be sought immediately.

Those taking erythromycin as prophylaxis should increase the dose to a therapeutic level or change to an alternative broader spectrum antibiotic. There is no data on modifying antibiotic prophylaxis regimens based on local antimicrobial resistance patterns.

Recommendations for Travellers

Asplenic patients should be strongly advised of the increased risk of severe falciparum malaria. Travel to areas where malaria is endemic should be discouraged. If patients do travel to such areas scrupulous adherence to antimalarial prophylaxis is essential.

Meningococcal A+C or A,C,Y+W135 vaccine is recommended for all those travelling to areas where there is an increased risk of infection.

Other Measures

It is essential to educate patients regarding the risk and importance of prompt recognition and treatment of infection. The UK Splenectomy Trust has produced useful patient information leaflets.

Patients should be encouraged to wear a Medic-Alert bracelet or necklace.

Patients should also be encouraged to carry a card with information about their asplenia, other clinical information and contact telephone numbers.

Animal bites: Ensure adequate antibiotic cover after dog (and other animal) bites, as asplenic patients are particularly susceptible to infection by *C. canimorsus* and should receive a five day course of co-amoxiclav (erythromycin in patients allergic to penicillin).

Tick bites: Babesiosis is a rare tickborne infection. Patients (especially those in contact with animals) should be warned of the danger of tick bites transmitting the disease. Patients should be advised to check themselves or have themselves inspected for tick bites if they are in an at-risk situation. Clinical presentation is with fever, fatigue, and haemolytic anaemia. Diagnosis is made by identifying the parasites within red blood cells on blood film and by specific serology. Quinine (with or without clindamycin) is usually an effective treatment.

Patient information leaflets and Splenectomy cards are available from the Department of Public Health or the Infectious Disease Unit, Southern Health Board.

These guidelines and the patient information leaflets are available on the SHB Intranet and Internet (www.shb.ie).

The UK Splenectomy Trust, c/o Dr Mayon-White, Oxfordshire Health Authority, Richards Buildings, Old Road, Headington, Oxford, OX3 7LG, UK also produce a patient fact sheet.

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Asplenia: Key Points

- All splenectomised patients and those with functional hyposplenism should receive pneumococcal immunisation
- Patients not previously immunised should receive Haemophilus influenzae type b vaccine
- Patients not previously immunised should receive MenC vaccine
- Annual influenza immunisation is recommended
- Prophylactic antibiotics are recommended (oral phenoxymethylpenicillin or an alternative)
- Asplenic patients are at risk of severe malaria
- Animal and tick bites may be dangerous
- Patients should be given a leaflet and a card to alert health professionals to their risk of overwhelming infection
- Patients developing infection despite prophylactic measures must be given a systemic antibiotic and urgently admitted to hospital

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