Continued need for pneumococcal prophylaxis after splenectomy

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Abstract

Two children died from pneumococcal infection five and eight years after splenectomy. Pneumococcal vaccination had not been given to either child. When the infection developed both children were not taking prophylactic penicillin. Vaccination and daily penicillin reduce the incidence of this complication and therefore we strongly recommend that both of these measures are continued indefinitely.

After splenectomy there is an increased incidence of bacterial infection of which *Streptococcus pneumoniae* accounts for 70% of the cases, most of the remainder being caused by other encapsulated organisms such as *Haemophilus influenzae* and *Neisseria meningitidis*.[1] Most infections occur within two years of splenectomy but the risk of infection is life long.[1]

Penicillin and pneumococcal vaccination may reduce the frequency of pneumococcal infection in such patients.[2 3] Such prophylactic measures are highlighted by two cases in whom prophylaxis was not given and who subsequently developed a fatal pneumococcal infection five and eight years after splenectomy.

Case reports

CASE 1

An 8 year old boy underwent splenectomy after abdominal trauma. Autotransplantation of splenic tissue was unsuccessful. He had not been vaccinated and had stopped taking prophylactic penicillin two years after splenectomy. Three years later, aged 13 years, he presented to his local hospital with a three day history of headache. A lumbar puncture was performed and *S pneumoniae* was isolated. Benzylpenicillin (60 mg/kg every two hours) and chloramphenicol (25 mg/kg every six hours) were commenced.

Twelve hours after presentation he developed signs of raised intracranial pressure. Mannitol 20% (1 g/kg) was given and he was transferred for further care. On arrival, a computed tomogram showed mild cerebral oedema with obliteration of the sulci. Six hours later he developed focal right sided seizures. He was therefore intubated and electively hyperventilated to maintain the arterial carbon dioxide tension between 3·0–3·5 kPa, and the total daily fluids were restricted to 30 ml/kg/24 hours. Twenty four hours later a repeat computed tomogram showed diffuse subarachnoid haemorrhage and extensive cerebral oedema. He died 10 days later.

CASE 2

A splenectomy was performed on a 4 year old boy for splenic rupture after abdominal trauma. No pneumococcal vaccine was given and prophylactic penicillin was stopped at 8 years of age.

When he was 12 years old he presented to his local hospital with septic shock after a 36 hour 'flu like' illness. He was cyanosed and hypotensive. Despite prompt resuscitation multiorgan failure developed within 12 hours of admission. He was then transferred to the regional paediatric intensive care unit. On examination the patient was moribund with gangrene of the extremities. Haematological investigations confirmed disseminated intravascular coagulation. *S pneumoniae* had been isolated in the blood and treatment with benzylpenicillin (50 mg/kg every four hours) and cefotaxime (75 mg/kg every eight hours) was continued. Despite aggressive management he died four hours after transfer.

Discussion

The incidence of overwhelming postsplenectomy infection or meningitis, due to *S pneumoniae*, varies in different series from 1·5% to 25%. The lowest incidence of infection after splenectomy (1·5%) occurs in children who undergo splenectomy because of trauma. When splenectomy is performed for an underlying haematological or oncological disorder—for example, Hodgkin's disease—the incidence can be appreciably higher (10%).[1] Because of the increased risk of such infection in children under 5 years of age and the 50% to 70% mortality associated with it,[1] physicians caring for such children need to be aware of the measures which may reduce its incidence. If overwhelming postsplenectomy infection does occur prompt resuscitation with the use of colloid to achieve haemodynamic stability as well as appropriate antibiotic and inotropic treatment may lessen the mortality.

Of the advice and measures available to reduce its incidence, the most important of all is to keep the parents fully informed of the predisposition of the child to overwhelming infection and this should be continually re-emphasised together with the need to seek urgent medical attention if the child becomes unwell.

A new pneumococcal vaccine Pneumovax II (Morson) and daily penicillin are the two most commonly available prophylactic measures. No definitive recommendation policy exists regarding their use, although recent proposals suggested that children at high risk, over the age of 2 years, should receive vaccination and be considered for revaccination every six years.[4 5]

Pneumovax II contains 25 μg of the capsular polysaccharide from each of the 23 serotypes that account for 90% of the pneumococci isolated from blood cultures.[4 5] Protection from pneumococcal infection after vaccination is thought to be depen-

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dent on achieving a good antipneumococcal antibody response and a serum antibody nitrogen concentration greater than 300 ng/ml is believed to offer protection for two to five years.[3] If possible vaccination should occur two weeks before splenectomy as higher antibody titres are produced. When a splenectomy is performed as an emergency such as after abdominal trauma, however, vaccination should still be performed because the antibody titres achieved are considered to be protective in most cases.

Although vaccination is generally thought to be effective, overwhelming pneumococcal sepsis in previously vaccinated patients does occur.[6] This may be due to several factors: (a) not all pneumococcal subtypes are covered in the vaccine; (b) the subtypes do not produce equal titres of antipneumococcal antibodies; and (c) the antibody titres, which may originally have been adequate, may decrease with time exposing the patient to pneumococcal infection.

Because of the latter reason revaccination of high risk adult patients has been performed with few side effects.[4] In children, however, revaccination is not currently recommended within six years of the primary vaccination.[4] Primary vaccination in children under 2 years of age is currently not recommended because of poor antibody production.

The Pneumovax II vaccine fails to cover all the pneumococcal subtypes. The loss of protection with time after vaccination because of the falling antipneumococcal antibody titres, repeated measurements of which in high risk patients would be logistically difficult to organise, means there is a need for a second concurrent prophylactic measure.

Prophylactic daily penicillin, which would theoretically cover all the pneumococcal subtypes, has been shown to be effective in reducing the incidence of pneumococcal sepsis in postsplenectomy patients. Its indefinite prophylactic use has been recommended in one study.[2] Poor compliance, allergic reactions, and the risk of producing penicillin resistant pneumococcal strains are the main problems cited with this approach.

Because of the previous reports on overwhelming postsplenectomy infection,[1 3] together with our own experience, we strongly recommend for all children who undergo splenectomy:

(1) Vaccination with Pneumovax II and revaccination at intervals of six years.

(2) Continuation of penicillin indefinitely or at least until the child has left an environment where there is an increased epidemiological risk of pneumococcal infection, such as school, university, or the armed forces.

(3) Continual parental awareness and vigilance.

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Visceral leishmaniasis in a Scottish child

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Abstract

A Scottish girl acquired visceral leishmaniasis (kala-azar) while on holiday in Majorca. She presented with the infection, six months later, in Scotland. Because of inexperience with the disease and a degree of scepticism unnecessary investigations were carried out resulting in a delay in treatment.

Visceral leishmaniasis (kala-azar) is found in an area extending from the Straits of Gibraltar, across the Mediterranean through Asia to China. The vector is a sandfly, which transmits the infection from the natural reservoir usually an infected dog, to human beings during feeding. The sandfly does not survive in the colder climates north of the Mediterranean and leishmaniasis is virtually unknown in these countries.[1] Because of its long incubation period (six weeks to three years), however, it is possible for kala-azar acquired in an endemic area to present in a country where the disease is not endemic. We describe the case of a Scottish girl who acquired kala-azar while on holiday in a Mediterranean country and presented with the infection in Scotland.

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Case report

A 9 month old girl was admitted to the Royal Hospital for Sick Children, Glasgow, with a 10 day history of lethargy, pallor, fever, and poor feeding. On examination she was found to have a mass in the left hypochondrium. She was febrile and miserable. Her haemoglobin concentration was 65 g/l, white cell count $6{\cdot}3\times10^9$/l, and platelets 41×10^9/l. Initially she was thought to be suffering from a malignant condition and was investigated accordingly. Bone marrow examination, blood culture, chest radiography, skeletal survey, and urine catecholamines were all normal. Abdominal ultrasound examination showed the mass to be a massively enlarged spleen.

She was given a blood transfusion and antibio-