Preventing severe infection after splenectomy

Patients should know the risks, be immunised, and take prophylactic antibiotics

Splenectomy may be followed by severe systemic infection because such surgery removes the splenic macrophages that filter and phagocytose bacteria and other bloodborne pathogens. Overwhelming post-splenectomy infection (OPSI), as this complication is called, is uncommon but has high mortality.

Overwhelming post-splenectomy infection is usually caused by the encapsulated bacteria *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Neisseria meningitidis* and more than half of those infected die.[1] Other pathogens in such infection may include bacteria such as *Escherichia coli* and *Pseudomonas aeruginosa*,[2] *Capnocytophagia canimorsus*, group B streptococci, *Enterococcus* spp, *Ehrlichia* spp, and protozoa such as the *Plasmodium* spp leading to malaria.

The first description of overwhelming post-splenectomy infection was published by King and Schumaker in 1952.[3] The disease may begin as a minor flu-like illness that rapidly escalates into a fulminant infection.[2] It is most common in the first two years after splenectomy but may occur decades later.[4] Its true incidence is not known, but the estimated incident rate among patients who have had splenectomy is 0.18-0.42% per year, with a lifetime risk of 5%. There are only limited data relating to morbidity and mortality, primarily because of a lack of systematic studies.

Bisharat et al reviewed all 78 studies published between 1966 and 1996.[5] Twenty eight contained data relating to incidence, morbidity, and mortality and the effects of infection in different age groups. Of 19 680 patients who had had a splenectomy, 3.2% developed invasive infection, and the overall mortality was 1.4%. The mean interval between splenectomy and infection was 22.6 months. The incidence of infection was higher for patients with thalassaemia major (8.2%) and sickle cell anaemia (7.3%) than for patients with idiopathic thrombocytopenia (2.1%), and higher in children with thalassaemia major (11.6%) and sickle cell anaemia (8.9%) than in adults with the same diseases (7.4% and 6.4%, respectively). The most reliable incidence data are probably those of Schwartz et al, who found a risk of fulminant infection of one case per 500 person years of observation.

The main risk factors are the age at which splenectomy occurs, with children being particularly at risk; the reason for splenectomy; and the time interval from splenectomy (most cases occur within two years).[6] The reliability of studies on the incidence has been hampered by limited statistical precision and by study groups that are too small with wide variation in age ranges of the patients studied, and by heterogeneity in the underlying pathology leading to splenectomy and the indications for splenectomy.

Guidelines published by the British Committee for Standards in Haematology emphasised that most infections after splenectomy could be avoided through measures that include offering patients appropriate and timely immunisation, antibiotic prophylaxis, education, and prompt treatment of infection.[7] These guidelines have been updated[8] and now recommend vaccination at least two weeks before splenectomy, oras soon as possible after emergency splenectomy has been performed—for example, after trauma.

Vaccines should include those for pneumococcal infections, with boosters every five to 10 years as dictated by levels of antibody titres; and for *H influenzae* type B, against which most children in the United Kingdom will have been immunised already: the effect of reimmunisation against this pathogen is not known. Previous recommendations did not include meningococcal vaccination,[7] but the revised guideline recommends meningococcal serogroup C conjugated vaccine for unimmunised patients.[8] Patients should also be offered annual influenza vaccination. Despite these guidelines, a recent audit in Scotland showed that immunisation practice for patients after splenectomy varied considerably, with only 13% of patients receiving all three vaccines before elective splenectomy.[9]

The role and efficacy of antibacterial prophylaxis remains unclear, and not all countries recommend it. Some studies show that patients may not adhere to prophylaxis but, in the absence of robust systematic evidence against this approach, the chief medical officer in the United Kingdom recommends lifelong prophylaxis with oral phenoxymethylpenicillin (or erythromycin for people who are allergic to penicillin). Patients who develop infection despite vaccination and antibacterial prophylaxis should go into hospital for treatment with broad spectrum systemic antibiotics. In addition, patients might keep a supply of antibiotics at home, changing from prophylactic to therapeutic doses if they develop febrile illness. This is particularly important for those who do not, or will not, take prophylaxis, a group whom doctors should make more aware of the risk and dangers of infection.

Patients need to know the nature and likelihood of overwhelming post-splenectomy infection and that they should seek medical attention if they become ill and feverish. The audit by Kyaw et al showed that only half of patients received information about antibiotic prophylaxis.[9] Each patient should carry at all times a letter or card documenting the splenectomy and should wear a bracelet or pendant to signal their status to doctors and other healthcare staff. Healthcare records in hospital and primary care should clearly record that these patients have had splenectomy. Primary care doctors, who may be responsible for keeping patients fully immunised, should know what vaccinations these patients have had.

Adrian Newland *professor*

(a.c.newland@qmul.ac.uk)

Drew Provan *senior lecturer*

Department of Haematology, St Bartholomew's and the Royal London School of Medicine and Dentistry, London El IBB

Steven Myint *editor in chief*

Journal of Infectious Disease, The Brae, Dunmow, Essex CM6 1HU

Competing interests: None declared

1 Deodhar HA, Marshall RJ, Barnes JN. Increased risk of sepsis after splenectomy. *BMJ* 1993;307:1408-9.

BMJ 2005;331:417–8

2 Cullingford GL, Watkins DN, Watts AD, Mallon DF. Severe late postsplenectomy infection. *Br J Surg* 1991;78:716-21.
3 King H, Shumacker HB Jr. Splenic studies. I. Susceptibility to infection after splenectomy performed in infancy. *Ann Surg* 1952;136:239-42.
4 Evans DI. Postsplenectomy sepsis 10 years or more after operation. *J Clin Pathol* 1985;38:309-11.
5 Bisharat N, Omari H, Lavi I, Raz R. Risk of infection and death among post-splenectomy patients. *J Infect* 2001;43:182-6.
6 Schwartz PE, Sterioff S, Mucha P, Melton LJ 3rd, Offord KP. Postsplenectomy sepsis and mortality in adults. *JAMA* 1982;248:2279-83.
7 Guidelines for the prevention and treatment of infection in patients with an absent or dysfunctional spleen. Working Party of the British Committee for Standards in Haematology Clinical Haematology Task Force. *BMJ* 1996;312:430-4.
8 Davies JM, Barnes R, Milligan D. Update of guidelines for the prevention and treatment of infection in patients with an absent or dysfunctional spleen. *Clin Med* 2002;2:440-3.
9 Kyaw MH, Holmes EM, Chalmers J, Jones IG, Campbell H. A survey of vaccine coverage and antibiotic prophylaxis in splenectomised patients in Scotland. *J Clin Pathol* 2002;55:472-4.

Medical needs of immigrant populations

Will lead to new challenges for the NHS in future

The world's population has doubled over the past 50 years.[1] The annual growth rate of 1.3% will result in a further increase to around 9 billion by 2050. Nearly a third of this growth is attributed to three countries in South Asia—namely India (21%), Pakistan (5%), and Bangladesh (4%)—which have historic, cultural, and economic ties with the United Kingdom. According to the International Organisation for Migration, the total number of migrants worldwide increased from 84 million in 1975 to 175 million by 2000,[2] and by 2050 it may have reached 230 million.

Meanwhile, the global population of elderly people is increasing. By 2050 the overall growth rate of 2.4% per year will result in a threefold increase in the number of people aged 60 or older to 2 billion, with eight out of every 10 elderly people living in developing countries.[3]

Large demographic changes will occur in Europe.[4] The current population of the European Union of 452 million will shrink to around 400 million despite its current inward migration rate. Populations in some European countries will decrease by a quarter while becoming considerably older. By 2050 the proportion of elderly people is expected to have risen from 20% to 37%, with a big impact on Europe's economies and social infrastructures.

These trends in international migration and population ageing will probably increase the influx of South Asians to the United Kingdom. Many will bring elderly relatives with them given that, in Asian countries, 70% of elderly people live with their children. In the UK over the past decade the ethnic minority population has grown by 53% and now comprises 7.9% of the total population.[5] South Asians, the largest ethnic minority group, now number two and a half million people and account for 50% of ethnic minority groups, with another 15% of the ethnic population described as of mixed race. Although increasing immigration may provide a welcome solution to such shrinking and ageing among Europe's populations[6] it will almost certainly have a substantial impact on health services such as the NHS, because South Asians have higher rates of coronary heart disease, diabetes, hypertension, stroke, hip fractures, and renal failure.[7 8]

So what needs to be done? The European Union must encourage managed migration. The union needs cohesive policies for immigration and health which can respond properly to the medical needs of the migrant population. First, though, policy makers should assess the likely effects of further migration on health services before enforcing big changes in the numbers of migrants. Ill conceived and short sighted attempts to develop services could prove to be a disastrous knee jerk reaction.

The UK currently allows in 150 000 migrants a year. Those in charge of developing and modernising the NHS should take account of the rapidly changing demography of the nation, understand better the needs of ethnic minority populations, and target health promotion at people in those populations who are at high risk of disease.

Basic and postgraduate training for doctors, nurses, and professions allied to medicine must include learning about ethnic diversity and transcultural medicine, while academics must more widely debate and develop capacity for clinical research in transcultural medicine.[9] Meanwhile, royal colleges, specialist societies, voluntary organisations, patients' groups, and community leaders could do much more to promote and share expertise on the health of people from ethnic minorities.

Lastly, exchange programmes for health professionals in the UK and less developed countries would allow dissemination and adaptation of the UK's substantial knowledge in managing diseases of old age and chronic diseases, as well as of health service finance and management.

Shahid Anis Khan *consultant physician*
Partha Ghosh *consultant physician*

(shahidak@aol.com)

Elderly Care and General Medicine, Lister Hospital, Stevenage SG1 4AB

Competing interests: None declared.

1 United Nations. *World population prospects: the 2002 revision*. New York: UN Publications, 2002. www.un.org/esa/population/publications/wpp2002/WPP2002-HIGHLIGHTSrev1.PDF (accessed 30 Mar 2005).
2 International Organisation for Migration. *Report. World migration 2003: managing migration. Challenges and responses for people on the move*. New York: UN Publications, 2003. http://noc.iplexx.at/~admin19/en/images/uploads/WMR_FLYER%20Vienna2_1085668151.pdf (accessed 30 Mar 2005).
3 United Nations. *Migration patterns and policies in the Asia and Pacific region*. Asian Population Studies series. Series No: 160, 2003. New York: UN Publications, 2003. www.unescap.org/esid/psis/population/popseries/apss160/index.asp (accessed 30 Mar 2005).
4 United Nations. *World economic and social survey 2004. Part II*. UN Publications, 2004. www.un.org/esa/policy/wess/wess2004files/part2web/part2web.pdf (accessed 30 Mar 2005).
5 Office for National Statistics. *Census, April 1991 and 2001*. www.statistics.gov.uk/cci/nugget.asp?id=455 (accessed 28 Jul).
6 United Nations. *A Europe open to well managed migration will be fairer, richer, stronger, says secretary-general in Brussels address*. Press release SG/SM/9134. New York: UN Publications, 2004. www.un.org/News/Press/docs/2004/sgsm9134.doc.htm (accessed 30 Mar 2005).
7 Department of Health. *Health survey for England 1999. The health of minority ethnic groups*. www.dh.gov.uk/PublicationsAndStatistics/PublishedSurvey/HealthSurveyForEngland/HealthSurveyResults/HealthSurveyResultsArticle/fs/en?CONTENT_ID=4015530&chk=cKvNuP (accessed 30 Mar 2005).
8 Bhopal R. Epidemic of cardiovascular disease in South Asians. *BMJ* 2002;324:625-6.
9 Rathore SS, Krumholz MH. Race, ethnic groups, and clinical research. *BMJ* 2003;327:763-4.

BMJ 2005;331:418