

Commentary

Splenectomy and sepsis

Further studies are needed to develop evidence-based recommendations for vaccinations and prophylactic antibiotic regimens

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Throughout the ages, the function of the spleen was subject to much conjecture. It was variously thought to be both the centre of melancholy by the French and the centre for anger by the English ("to vent one's spleen"). Of no doubt was that if the spleen was ruptured, survival was unlikely. Modern surgery has allowed the survival of patients with a ruptured spleen, usually following trauma, by performing a splenectomy, thus preventing further haemorrhage. For a long time after the procedure was perfected, it was thought to have little, if any, long-term consequence, with the spleen considered a rather redundant organ like the appendix. From early last century, it became apparent that splenectomy increased the risk of infection, particularly with encapsulated organisms such as *Streptococcus pneumoniae*, and increased mortality in malaria. It is now known that, far from being useless, the spleen plays a complex role in the maintenance of normal immune function producing IgM memory B cells, sequestering opsonised encapsulated bacteria and modulating the deleterious effects of cytokines released during sepsis.

The article by Dendle and colleagues¹ in this issue of the Journal uses administrative data collected across all Victorian hospitals to define postsplenectomy infection rates in Victoria, with some risk stratification, to attempt to inform further infection prevention efforts. It shows that the highest risks for severe sepsis occur among older patients who undergo a splenectomy for haematological malignancy. This comes as no surprise, as these patients are already at high risk given their underlying condition. However, the main weakness in this article is its inability to define the attributable morbidity associated with splenectomy in this group. Overwhelming postsplenectomy infection is a rare but frequently fatal complication, usually caused by *Streptococcus pneumoniae*. Vaccinations against pneumococcus, *Haemophilus influenzae* and *Neisseria meningitidis* are widely recommended as a low-risk intervention that can be applied relatively easily in the hospital setting. Despite this, data from a Victorian hospital published in 1990 showed that only two-thirds of multitrauma patients and as few as 11% of patients with an incidental splenectomy were offered vaccination.² This illustrated the benefit of systematic notification of splenectomy through processes such as a splenectomy registry, pioneered in Victoria. At Princess Alexandra Hospital, Brisbane, all

patients undergoing splenectomy are automatically referred to the infection management service by the operating theatre electronic record. Vaccinations are offered and administered, together with counselling and information about infection risk. We estimate near 100% coverage over the past 10 years (unpublished data).

Antibiotic prophylaxis has been a more controversial intervention, particularly among patients with lower risks of postsplenectomy sepsis, such as adults, or those having a splenectomy for trauma without other comorbidities associated with immunosuppression. Traditionally, oral penicillin has been used for its activity against *S. pneumoniae*. Increasingly, penicillin non-susceptible strains of *S. pneumoniae* pose a theoretical risk to this regimen. Cases of overwhelming postsplenectomy infection caused by such strains are yet to be reported. In the study by Dendle and colleagues, the predominant pathogens were *Staphylococcus aureus* and gram-negative bacteria, as would be expected in most bloodstream infection datasets. These organisms would not generally be susceptible to penicillin.

The study provides a broad insight into infection outcomes in splenectomised individuals in contemporary Australia. In order to develop modern evidence-based recommendations for vaccination and prophylactic antibiotic regimens, future prospective studies will need to determine the attributable risk of the various types of infection from splenectomy in diverse patient groups. This will allow a calculation of the potential reduction in morbidity and mortality with both vaccination and antibiotic prophylaxis. Adverse effects from broader spectrum antibiotic regimens such as antibiotic resistance and *Clostridium difficile*-associated diarrhoea would also need to be considered, and the practical issue of compliance with years of antibiotic prophylaxis cannot be overlooked. The relative contribution of education to preventing infection-related morbidity also needs to be quantified. The improvements in infection rates following the introduction of the Victorian Spleen Registry are encouraging in this regard, although cause and effect cannot be proven.

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- 1 Dendle CL, Sundararajan V, Spelman T, et al. Splenectomy sequelae: an analysis of the infectious outcomes in Victoria. *Med J Aust* 2012; 196: 582-586.
- 2 Siddins M, Downie J, Wise K, O'Reilly M. Prophylaxis against postsplenectomy pneumococcal infection. *Aust N Z J Surg* 1990; 60: 183-187.

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