CONCLUSIONS: A significant response to pneumococcal PS vaccination was found in all three groups (HL, AIHA/ITP and TRAUMA) of splenectomized patients.

METHODS: A total of 311 splenectomized individuals were included in this prospective study (208 HL; 15 AIHA; 60 ITP; 28 TRAUMA). Depending on their individual cytopenias [autoimmune haemolytic anaemia (AIHA) and immune thrombocytopenic purpura (ITP)] and also individuals who were splenectomized because of trauma (TRAUMA).

RESULTS: A significant response was recorded on primary vaccination as well as on two revaccination occasions for HL, AIHA/ITP, as well as TRAUMA patients. None of the variables age, gender, or time elapsed between splenectomy and first pneumococcal vaccination was found to be associated with mean PS antibody levels at prevaccination, peak or follow-up. No severe adverse events were reported. Amongst 124 clinically monitored HL patients, 10 OPSI were recorded in seven patients after 1 year +/- 6 months (follow-up). Patient files, a national population-based database, and microbiological databases were checked for 124 HL patients to identify anti-PS antibody levels measured by enzyme-linked immunosorbent assay technique the patients were revaccinated with 23-valent pneumococcal PS vaccine up to 1 year period. One of these patients, a middle-aged female, died as a result of fulminant pneumococcal bacteraemia, which was her third OPSI during a 7-year period.

BACKGROUND: Splenectomy is accompanied by a life-long risk of overwhelming postsplenectomy infection (OPSI), mainly caused by polysaccharide (PS) encapsulated bacteria such as Streptococcus pneumoniae. Despite extensive prophylactic efforts the mortality and morbidity rates remain high. The present study assessed antibody response to pneumococcal polysaccharide antigens in patients that have been previously vaccinated with PCV7 (pneumococcal conjugate vaccine 7-valent) or PCV13? Thanks for your assistance.

Key Words: pneumococcal vaccine, immunization, immunodeficiency

Question:
Dr. Lieberman,
How would you evaluate antibody response to pneumococcal polysaccharide antigens in patients that have been previously vaccinated with PCV7 (pneumococcal conjugate vaccine 7-valent) or PCV13? Thanks for your assistance.

Ari Kounavis (AAAAI Member)
Email: akouna@lsuhsc.edu
Qualifications: fellow

Answer:
Dear Dr. Kounavis:

Thank you for your recent inquiry.

There are no definitive studies designed to answer your specific question, but we can draw some conclusion based upon early studies of the response to repeated pneumococcal vaccines. There is good evidence that a patient responds briskly to repeated injections of pneumococcus when they are reimmunized with vaccines containing the same serotype. For example, an early study (1) showed that with revaccination, IgG levels returned to ± 40% of original post-vaccination levels. The kinetics of IgM and IgG antibody responses in this study seemed to be the same with both first and second exposures (1). In a later study (see Journal of Internal Medicine abstract copied below), significant antibody response was recorded to both primary and to revaccinations.

Based upon these and other early studies of the immune response to repeated pneumococcal vaccines, it is probably safe to conclude that a person would respond anamnestically to strains contained in both the PCV7 and PCV13 vaccines, and would respond with a primary antibody response to strains to which they were not previously exposed. And, because of the normally brisk response to repeat vaccination noted above, one should be able to use the same criteria to judge response in both the primary and anamnestic responses. These criteria are somewhat in flux, but I do not believe that there would be any significant difference as to your interpretation of an adequate immune response, whether that response would be primary or secondary based upon the references noted above.

As to what would be an adequate response, I refer you to a previous entry on the Asthma and Allergic Disease Management Center website, "Ask the Expert" section, that was published online 8/3/10. You may access this entry by typing "Francisco Bonilla" into the search box of the website. Dr. Bonilla discusses what an adequate response to pneumococcal immunization (regardless of whether it is primary or secondary) would be. I think that you will find this helpful to you in terms of the interpretation of the results of immunization.

Thank you again for your inquiry and we hope this response is helpful to you.

Reference:

Abstract:
A prospective study on antibody response to repeated vaccinations with pneumococcal capsular polysaccharide in splenectomized individuals with special reference to Hodgkin's lymphoma.

Division of Hematology, Department of Medicine, Karolinska Hospital and Institutet, Stockholm, Sweden. ola.landgren@ks.se

Abstract
BACKGROUND: Splenectomy is accompanied by a life-long risk of overwhelming postsplenectomy infection (OPSI), mainly caused by polysaccharide (PS) encapsulated bacteria such as Streptococcus pneumoniae. Despite extensive prophylactic efforts the mortality and morbidity rates remain high. The present study was based on a strategy with a predefined vaccination algorithm including repeated 23-valent pneumococcal vaccinations and monitoring of pneumococcal antibody levels. The antibody levels of splenectomized Hodgkin's lymphoma (HL) patients were compared with those patients splenectomized due to immune-mediated cytopenias [autoimmune haemolytic anaemia (AIHA) and immune thrombocytopenic purpura (ITP)] and also individuals who were splenectomized because of trauma (TRAUMA).

METHODS: A total of 311 splenectomized individuals were included in this prospective study (208 HL; 15 AIHA; 60 ITP; 28 TRAUMA). Depending on their individual anti-PS antibody levels measured by enzyme-linked immunosorbent assay technique the patients were revaccinated with 23-valent pneumococcal PS vaccine up to four times in accordance with the predefined algorithm. For each vaccination occasion, serum was collected at vaccination, after 1 month +/- 2 weeks (peak), and after 1 year +/- 6 months (follow-up). Patient files, a national population-based database, and microbiological databases were checked for 124 HL patients to identify OPSI.

RESULTS: A significant response was recorded on primary vaccination as well as on two revaccination occasions for HL, AIHA/ITP, as well as TRAUMA patients. None of the variables age, gender, or time elapsed between splenectomy and first pneumococcal vaccination was found to be associated with mean PS antibody levels at prevaccination, peak or follow-up. No severe adverse events were reported. Amongst 124 clinically monitored HL patients, 10 OPSI were recorded in seven patients during the study period. One of these patients, a middle-aged female, died as a result of fulminant pneumococcal bacteraemia, which was her third OPSI during a 7-year period.

CONCLUSIONS: A significant response to pneumococcal PS vaccination was found in all three groups (HL, AIHA/ITP and TRAUMA) of splenectomized patients.
Importantly, both primary and repeated vaccinations were safe. Until further knowledge is gained regarding the protective concentration of serotype-specific antibody concentrations we believe that the value of vaccination and frequent revaccination (every 1–5 years) in combination with education of patients and health care professionals and clinical monitoring is beneficial for these patients at risk for OPSI.

Sincerely,

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