PFGE) was isolated from the fecal flora of an infant with no exposure to dairy L. rhamnosus GG.

In conclusion, although generally innocuous [10], the risk of association with invasive infections for probiotic lactobacilli that provide beneficial physiological effects may be comparable to that for other intestinal lactobacilli. The only way to evaluate the clinical significance of this risk would be to follow the incidence of infections caused by lactobacilli in general and carefully type and compare the isolates on a molecular level to known probiotic strains of fermented foods.

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References


In 1992, the prevalence of nasopharyngeal carriage of penicillin-resistant S. pneumoniae was 53% (65 of 123 isolates) in children attending a day care center or visiting a county health center in rural western Kentucky. For 41 (63%) of the 65 S. pneumoniae isolates, the MICs of penicillin were ≥2 μg/mL, and 61 (50%) of the 123 isolates were multidrug resistant [1]. From January 1992 to January 1994, S. pneumoniae with penicillin MICs of >0.06 μg/mL were detected in 48 (31%) of 157 pneumococcal middle ear isolates from 246 ambulatory patients living in rural Kentucky. For 23 (15%) of the 157 pneumococcal middle ear isolates, penicillin MICs were ≥2 μg/mL [2]. Recently, Mainous et al. [3] reported that 35 (34%) of 104 nasopharyngeal cultures from 104 healthy children who attended one of eight rural central Kentucky day care centers in the spring of 1997 yielded S. pneumoniae. Five (14%) of the 35 isolates were penicillin resistant and 14 (40%) were of indeterminate susceptibility to penicillin. In addition, 9 isolates (26%) were resistant to erythromycin, 14 (40%) were resistant to trimethoprim-sulfamethoxazole (TMP-SMZ), and 3 (9%) were resistant to cefotaxime [3].

To study our adult population, a case-controlled retrospective chart review study was completed. All cases of lung infection due to
S. pneumoniae in adults (≥17 years of age) treated at the University of Kentucky Medical Center (UKMC) from January 1995 to May 1998 were reviewed. The UKMC campus includes the University Hospital and a Department of Veterans Affairs Medical Center and is located in eastern Kentucky. Each patient from whom a penicillin-resistant S. pneumoniae (MIC, ≥1 μg/mL) isolate was recovered was matched with a control patient whose S. pneumoniae isolate was penicillin susceptible (MIC, ≥0.1 μg/mL) and from the same source (i.e., sputum, bronchial lavage fluid, or blood), and who was ill during the same season of the same year. Data collected included sex, age, smoking history, location of residence, pneumococcal vaccine history, complicating illness, date of infection, leukocyte count and differential, prior antibiotics within 42 days of diagnosis, HIV status, type of infection, length of stay in hospital, treatment of infection, treatment outcome, and blood culture results. MICs to penicillin and other antibiotics were recorded whenever possible for each isolate. For statistical comparisons a χ² analysis was used. The chart review and study were approved by the University of Kentucky’s Institutional Review Board and the Lexington Veterans Affairs Medical Center Research and Development Committee.

Between January 1995 and May 1998, cultures for 537 adult patients with pneumonia were positive for S. pneumoniae. Among these patients, 150 (28%) had an isolate of indeterminate susceptibility to penicillin (0.1 μg/mL <MIC>1 μg/mL). Thirty (6%) of the patients had a positive culture for penicillin-resistant S. pneumoniae.

Results (table 1) did not identify age, smoking, sex, location of residence, vaccination status, complicating illness, time of year, leukocyte response to infection, or HIV status as associated with acquiring a resistant pathogen. The type of illness (whether community-acquired pneumonia or nosocomial, or unilobar or multilobar pneumonia), length of stay in the hospital, blood culture positive for S. pneumoniae, and fatal outcome were not different between the two groups. It is of interest that only two of the 60 patients had been vaccinated against S. pneumoniae. There was a trend toward prior antibiotic exposure within 6 weeks of illness in the patients with penicillin-resistant S. pneumoniae (P = .07). More antibiotics were given to the patients with disease due to resistant S. pneumoniae than to the others (3.4 ± 0.4 vs. 2.3 ± 0.3, P < .05).

The MIC values for the resistant isolates were available for 14 strains. For 11 of the resistant S. pneumoniae, the MICs of penicillin were 2 μg/mL, and for one each the MICs were 1, 3, or 4 μg/mL. Antibiotic susceptibility patterns for erythromycin, tetracycline, and TMP-SMZ were available for 19 penicillin-resistant strains. Five (26%) of 19 isolates were resistant to all three agents. An additional four isolates (21%) were resistant to two of the three agents. Thirteen (68%) of 19 isolates were resistant to at least one of the three agents.

At the UKMC, ~2% of adult pneumonia is due to multidrug-resistant S. pneumoniae (resistant to penicillin, erythromycin, tetracycline, and TMP-SMZ), 6% of adult pneumonia is due to S. pneumoniae resistant to at least penicillin, and an additional 9% of cases are due to S. pneumoniae with indeterminate susceptibility to penicillin. Our study did not reveal differences in bacteremia, length of stay, and mortality between patients with pneumonia due to drug resistant S. pneumoniae and those with penicillin-susceptible S. pneumoniae. We did find that patients with penicillin-resistant S. pneumoniae received more antibiotics during their hospitalizations and were more likely to have received antibiotics within 6 weeks of their pneumonia than were the others. Of concern, many patients were candidates for pneumococcal vaccine and did not receive it.

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References
S. pneumoniae. was performed by using serotype-specific antisera for S. pneumoniae. The Alaska Natives have a high rate of invasive infection due to S. pneumoniae. Herein we report a fatal case of sepsis due to S. pneumoniae serotype 4 in an Alaska Native female patient with alcoholism who had received the 23-valent pneumococcal vaccine during a study 6 years earlier, but who did not demonstrate a rise in type 4 serotype-specific IgG antibodies after vaccination.

The patient had been participating in a prospective case-control study of alcoholics and nonalcoholics designed to (1) determine the immunogenicity of 23-valent pneumococcal vaccine after primary immunization in participants, (2) monitor serotype-specific antibody levels annually for 6 years, and (3) determine the immunogenicity after a booster dose 6 years after primary immunization [3]. Serotype-specific antibody levels to six serotypes (1, 4, 6B, 12F, 14, and 23F) were tested annually. Testing was performed by use of an antibody-capture ELISA. Serotyping of S. pneumoniae was performed by using serotype-specific antisera via the Quellung reaction at the Division of Bacterial and Mycotic Diseases, NCID, CDC in Atlanta. Antibiotic susceptibility testing was performed at the AIP by using the agar dilution method [5].

A 31-year-old Alaska Native alcoholic female presented to the hospital for evaluation of a 4-day history of fever, productive cough, and right pleuritic chest pain. The patient had been drinking alcohol heavily until 2 days before admission. At her initial physical examination she was alert and oriented. Her temperature was 101°F, she had tachycardia, and she had decreased breath sounds in the right lower lobe. Otherwise, the examination findings were unremarkable. Her WBC count was 800/mm³ with 40% band forms. Chest radiography showed a right-lower-lobe consolidation. She was treated with IV cefotaxime and clindamycin, IV fluids, and oxygen. On the second hospital day, her mental status deteriorated and she developed respiratory distress. Chest radiography was compatible with adult respiratory distress syndrome as well as right-lower-lobe pneumonia, and she was intubated and mechanical ventilation was instituted. Her initial blood culture yielded S. pneumoniae that was susceptible to both penicillin and cefotaxime (MIC of <0.03 for both antibiotics). Her hospital course was complicated by progressive hypoxia, despite 100% oxygen and pressure support; recurrent pneumothorax requiring chest-tube placements; bradycardia; and finally death on the 13th hospital day. Typing of the S. pneumoniae isolate recovered from blood showed it to be type 4.

Serum specimens were available 6 months before and on the day of vaccination, as well as on 10, 17, 19, 35, and 43 months postvaccination (figure 1). Sera were also available on the day of admission, the fifth hospital day, and the day of death. Antibody levels to six serotypes, including type 4 showed no significant rise 10 months after vaccination. The level of type 4 antibodies was <4 μg/mL 10 months after vaccination, and along with antibodies to the other 5 serotypes, fell progressively during the next 57 months.

Pneumococcal polysaccharide vaccine is currently recommended for all persons >65 years of age and for persons with chronic illnesses including alcoholism [1]. A meta-analysis of prospective trials has concluded that the vaccine appears to be efficacious in reducing bacteremic pneumonia in low-risk adults, but that it fails to demonstrate efficacy in high-risk patients [6]. In a case-control study on the immunogenicity of pneumococcal vaccine in Alaska Natives who are alcoholics, and Native and non-Native nonalcoholics, we found that alcoholics generally responded adequately to this vaccine as did nonalcoholic controls [3]. However, the magnitude of response was greater among nonalcoholics and significant for 2 serotypes (3 and 19F). In addition, we found wide variation from patient to patient in response to specific serotypes. Even for most healthy patients, response to vaccine of one or more serotypes was poor. Thus, while this vaccine likely has an efficacy of >50% for preventing bacteremic S. pneumoniae, individual failures resulting in invasive disease may be related to a previous inadequate vaccine response to the particular serotype responsible for the infection.

For the patient we described, who had fatal bacteremia secondary to serotype 4, her serotype 4 specific antibody level failed to increase after vaccination, and at the time of infection, she had extremely low levels of serotype 4 specific antibody. Results of a prospective trial of pneumococcal vaccine in U.S. veterans, which failed to demonstrate efficacy, indicated that most vaccine recipients with pneumococcal infections did not respond, or sustain antibodies, to antigens that subsequently caused their infections [7].

Recently, an emergence of drug-resistant strains of S. pneumoniae have been isolated in the United States and elsewhere [8]. It is hoped that a newer protein conjugate pneumococcal vaccine will offer better immunogenicity and efficacy against invasive S. pneumoniae disease.

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