Commentary

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Laboratory Manual of General Microbiology with Special Reference to the Microorganisms

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Description

Methicillin-resistant Staphylococcus aureus (MRSA) isolates came into existence soon after the introduction of methicillin. Historically, MRSA isolates have been associated with nosocomial infections and rapidly developed resistance to multiple drug classes. However, in recent years, different strains with unique phenotypes have emerged in the community, and the reservoir of community-associated MRSA is rapidly expanding. Community-associated pathogens are likely to cause life-threatening systemic infections, especially in children and elderly individuals, and may also cause serious skin and soft-tissue infections in healthy individuals. Compared with nosocomial strains, community-associated MRSA isolates are associated with increased virulence and currently are more likely to be susceptible to a variety of antibiotics. The epidemiological and microbiological differences between community-associated and nosocomial MRSA infections necessitate different strategies to prevent and treat the 2 types of infections. Vancomycin nonsusceptibility in S. aureus is on the increase, further complicating therapy. Methicillin-resistant Staphylococcus aureus (MRSA) is a major pathogen worldwide; MRSA infections are associated with increased morbidity and mortality, in comparison with other S. aureus infections. Over the past decade, the changing pattern of resistance in S. aureus has underscored the need for new antimicrobial agents [1]. Once confined to health care—associated environments, MRSA has now migrated into the community. Community-associated strains share some characteristics with nosocomial strains but also differ in antimicrobial susceptibility and potential virulence. of concern is the probable increasing prevalence of heterogeneous vancomycin-intermediate S. aureus (hVISA) and vancomycin-intermediate S. aureus (VISA) MRSA strains in Europe, Asia, and the United States [2]. Although 7 cases of infection with vancomycin-resistant S. aureus (VRSA) strains have been described in the United States, the clinical and epidemiological significance of this resistance phenotype is unclear at the present time [3].

Necrotizing fasciitis is a life-threatening soft-tissue infection primarily involving the superficial fascia. The present report describes the clinical presentation and microbiological characteristics of this condition as well as the determinants of mortality associated with this uncommon surgical emergency. The medical records of eighty-nine consecutive patients who had been admitted to our institution for necrotizing fasciitis from January 1997 to August 2002 were reviewed retrospectively. The paucity of cutaneous findings early in the course of the disease makes the diagnosis difficult, and only thirteen of the eighty-nine patients had a diagnosis of necrotizing fasciitis at the time of admission. Preadmission treatment with antibiotics modified the initial clinical picture and often masked the severity of the underlying infection. Polymicrobial synergistic infection was the most common cause (forty-eight patients; 53.9%), with streptococci and enterobacteriaceae being the most common isolates. Group-A streptococcus was the most common cause of monomicrobial necrotizing fasciitis. The most common associated comorbidity was diabetes mellitus (sixty-three patients; 70.8%). Advanced age, two or more associated comorbidities, and a delay in surgery of more than twenty-four hours adversely affected the outcome [4].

Candida auris, an emerging multidrug-resistant yeast associated with a high mortality rate, has been increasingly reported outside the United States to cause outbreaks in hospital settings. Although this organism is rare in the United States, its prevalence may be underestimated because of unreliable identification. The CDC has recently recommended that health care facilities place patients with C. auris colonization or infection in single rooms. Therefore, it is imperative for clinical microbiology laboratories to accurately identify this organism to aid in preventing health care-associated outbreaks [5].

Staphylococcus Aureus and Anaerobic Bacteria

The parotid gland is the salivary gland most commonly affected by inflammation. The most common pathogens associated with acute bacterial parotitis are Staphylococcus aureus and anaerobic bacteria. The predominant anaerobes include gram-negative bacilli (including pigmented Prevotella and Porphyromonas spp.), Fusobacterium spp., and Peptostreptococcus spp. Streptococcus spp. (including S.

pneumoniae) and gram-negative bacilli (including Escherichia coli) have also been reported. Gram-negative organisms are often seen in hospitalized patients. Organisms less frequently found are Arachnia, Haemophilus influenzae, Klebsiella pneumoniae, Salmonella spp., Pseudomonas aeruginosa, Treponema pallidum, cat-scratch bacillus, and Eikenella corrodens. Mycobacterium tuberculosis and atypical mycobacteria are rare causes of parotitis. Therapy includes maintenance of hydration and administration of parenteral antimicrobial therapy. Once an abscess has formed surgical drainage is required. The choice of antimicrobial depends on the etiologic agent. Maintenance of good oral hygiene, adequate hydration, and early and proper therapy of bacterial infection of the oropharynx may reduce the occurrence of suppurative parotitis [4].

The overall proportion of S. pneumoniae isolates and vaccine serotypes in AOM were significantly reduced by community-wide use of PCV7 vaccine in our practice. The proportion of Gram-negative bacteria became 2-fold more frequent than S. pneumoniae in AOM in PCV7-vaccinated young children where PCV7 uptake was community-wide and supply was adequate. Comparing each cohort (1992–1998 versus 2000–2003), the proportion of S. pneumoniae decreased from 48% to 31% (P = 0.009; relative risk, 0.754; 95% confidence interval, 0.628–0.906), and nontypable Haemophilus influenzae increased from 41% to 56% (P = 0.01; relative risk, 1.87; 95% confidence interval, 1.15–3.04; β-lactamase-positive, 56% versus 64%, not significant). The proportions of intermediate PNSP and resistant PNSP, respectively, were 16% and 9% versus 13% and 6% pre- and post-PCV7, respectively. Vaccine and vaccine-related serotypes, respectively, comprised 70% and 8% versus 36% and 32% of S. pneumoniae strains (P = 0.003). Post-PCV7, Gram-negative bacteria and β-lactamase-producing organisms accounted for two-thirds and one-half of all AOM isolates, respectively. Since Summer 2000, 94% of young children cared for by this 7-clinician, pediatric practice in rural central Kentucky received 3 or 4 doses of PCV7 in the first 18 months of life. Tympanocentesis was performed in children with intact bulging or full tympanic membrane(s), which were opaque, red or yellow discolored and usually immobile.6 In both cohorts, patients selected for middle ear culture of AOM had one or more of the following characteristics: (1) prominent severe symptoms of AOM (crying, fussiness, altered sleep patterns, otalgia and/or fever); (2) recurrent symptomatic or asymptomatic AOM unresponsive to previous antimicrobials during or post therapy; or (3) ill appearance. Middle ear otorrhea fluid was also cultured from patients who had spontaneously ruptured tympanic membrane(s) or with tympanostomy tubes draining <48 h. Some patients were also participants in comparative multicenter, randomized antibiotic clinical trials, which were approved by respective Institutional Review Boards. Informed consent for tympanocentesis was obtained from all patients undergoing the procedure.

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