Streptococcus zooepidemicus (Group C) Pneumonia in a Human

HAROLD D. ROSE,^{1,2*} JAMES R. ALLEN,^{1,3} AND GERHARD WITTE^{1,3}

Department of Medicine, The Medical College of Wisconsin, Milwaukee, Wisconsin 53226¹; Medical Service, Wood Veterans Administration Medical Center, Wood, Wisconsin 53193²; and Columbia Hospital, Milwaukee, Wisconsin 53211³

Lancefield group C streptococcal pneumonia appeared in a previously healthy young adult. The patient apparently acquired the infection while caring for her sick horse, and experienced a gradual onset of the illness. There was rapid accumulation of pleural fluid and empyema requiring open drainage. Group C pneumonia cannot be distinguished from classic group A pneumonia on clinical grounds. Beta-hemolytic streptococci isolated from sputum, transtracheal aspirates, pleural fluid, or blood of patients with pneumonia should be grouped by the precipitin method of Lancefield or one of its more rapid modifications.

Streptococci of Lancefield's group C can be recovered from the pharynx of 1.5% of normal humans (4, 10). Infection of the respiratory tract caused by these organisms is usually manifested as exudative pharyngitis or tonsillitis (15). Outbreaks of pharyngitis have been reported (2, 5). Group C streptococcal infection of the lower respiratory tract, however, is rare. The clinical manifestations of this type of infection are not well documented (9, 10). This report describes a patient with pneumonia and emphasizes the epidemiological and clinical aspects of the illness.

CASE REPORT

A previously healthy 23-year-old female was admitted to the hospital with a 3-week history of left pleuritic chest pain occurring in the evening and accompanied by a feverish sensation. Four days before admission she experienced a nonproductive cough and night sweats. There were no symptoms suggesting a preceeding upper respiratory infection. The patient was an ardent equestrienne who rode daily and was involved in the feeding and day-to-day care of her horse. Four weeks before admission, several animals in the stable (including her own) had a respiratory illness that was treated with penicillin by her veterinarian. To our knowledge, none of the other riders or stable personnel became ill.

Physical examination revealed an alert young female in mild respiratory distress. The temperature was 99.8°F (ca. 37.6°C). The pharynx was normal, and there was no adenopathy. Percussive dullness and crepitant rales were present over the left lower hemithorax.

The leukocyte count and differential were nor-

mal. Pharyngeal and sputum cultures yielded normal flora. Two blood cultures were sterile. A chest X-ray disclosed blunting of the left costophrenic angle and was suggestive of an infiltrate in the left midlung field.

Treatment was withheld during the first 6 hospital days while numerous diagnostic studies were performed. However, a repeat chest X-ray revealed a marked increase in the amount of pleural fluid on the left, and peak afternoon temperatures were noted to be 101°F (ca. 38.3°C). On two occasions, a thoracentesis yielded a greenish-yellow exudate that could not be completely evacuated. *Streptococcus zooepidemicus* was isolated in pure culture from both specimens (confirmed by Wisconsin Animal Health Laboratories, State Department of Agriculture). Intravenous aqueous penicillin G therapy was initiated in a high daily dosage and continued for 16 days. A trial of closed chest tube drainage was unsatisfactory because of loculated fluid. On hospital day 13 the patient underwent a thoracotomy. There were extensive fibrin deposits in the pleural cavity with separate loculations of clear fluid and greenish-yellow exudate. Decortication of the lung did not appear to be indicated, and two drainage tubes were left in the pleural space. The upper tube was removed after the fever subsided. The dependent tube was converted to open drainage, and the patient was discharged on postoperative day 9 with the recommendation that she take oral phenoxymethyl penicillin four times daily. She was doing well when examined in the Outpatient Clinic 3 weeks later. The chest tube was removed, and the phenoxymethyl penicillin was discontinued.

DISCUSSION

Group A streptococci are by far the most common cause of streptococcal respiratory infections in humans. Specific grouping of streptococci by the Lancefield precipitin method, however, is a time-consuming technique that is not routinely performed on all strains isolated in a hospital laboratory (8). Streptococci showing beta-hemolysis and bacitracin sensitivity are usually reported as belonging to group A (13, 14). Organisms belonging to group C are usually beta-hemolytic, can be sensitive to bacitracin, and may cause an elevated serum anti-streptolysin O titer after respiratory tract infection (2, 13). Thus, beta-hemolytic streptococci isolated from sputum, transtracheal aspirates, pleural fluid, or blood of patients with pneumonia should be grouped by the Lancefield precipitin method or by the more rapid and easily performed immunofluorescent (3) or coagglutination technique (8).

Those streptococci that are found to belong to group C can be further classified into four species. *Streptococcus equi*, *Streptococcus equisimilis*, and *S. zooepidemicus* are differentiated by their ability to ferment lactose, sorbitol, and trehalose (5, 6). *S. zooepidemicus* is usually lactose positive and does ferment sorbitol but not trehalose. The fourth species, *Streptococcus dysgalactiae*, has a variable reaction in these sugars; however, this organism differs from the others by being nonhemolytic. Aside from antibiotic sensitivity tests, no new methods to characterize or further classify these organisms have been forthcoming for years.

Each of these four recognized species has been isolated from domesticated animals, and they are known to cause the following infections: *S. equi*, strangles in horses; *S. dysgalactiae*, mastitis in cows; *S. equisimilis*, septicemia in young pigs; and *S. zooepidemicus*, nasopharyngitis and pneumonia in horses (12, 16). With rare exceptions, strains of group C streptococci isolated from humans belong to the species *S. equisimilis* (5, 7, 12). Isolation of *S. zooepidemicus* from our patient indicated that she probably acquired the infection while caring for her sick horse. Although *S. zooepidemicus* is the most frequently encountered bacterial species in respiratory infections of horses, the organism has a relatively low degree of pathogenicity for that animal (16, 17). Our patient had been ill for 3 weeks before admission to the hospital. Moreover, we are unaware of any previous reports of pneumonia in humans caused by this organism. These circumstances suggest that close contact with an infected animal is necessary before the organism

can be transmitted to humans and cause pneumonia.

Group A organisms are the cause of classical streptococcal pneumonia in humans (11). This infection usually follows a viral respiratory illness or streptococcal pharyngitis and is characterized by an abrupt onset accompanied by pleuritic pain, rapid accumulation of pleural fluid, and early appearance of loculated empyema (1, 11). Although the gradual onset in our patient suggests that group C pneumonia may be a more insidious infection, group A and group C streptococcal pneumonia cannot be distinguished purely on clinical grounds. Streptococci belonging to both groups are exquisitely susceptible to penicillin G in vitro, and the management of pneumonia caused by either organism is similar. Identification of a group C infection, however, may have epidemiological implications as to the source of the organism. Furthermore, acute rheumatic fever has not been reported after group C infections (6, 12). There is one report of a high incidence of glomerulonephritis following a milk-borne epidemic of group C pharyngitis (5).

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