INTRODUCTION

Peritonsillar abscesses are a common cause of emergency department visits, resulting in around 45,000 cases per year in the United States and occurring in 30 per 100,000 people. There are two main theories as to the etiology of peritonsillar abscesses. The first is an infection of the palatine tonsil, which spreads to the peritonsillar space, which is located between the palatine tonsil's capsule and the superior pharyngeal constrictor muscle. The second theory is that peritonsillar abscesses originate due to an infection of minor salivary glands, called the glands of Weber, located on the soft palate at the location of the superior tonsillar pole. The definitive treatment is surgical drainage or quincy tonsillectomy, and, typically, these patients are usually also on antibiotic agents. There is variation in the literature as to the type of microbial flora of peritonsillar abscesses and their antibiotic resistance. This is perhaps based on a variety of factors, including regional variation in bacterial flora and patient comorbidities. Here we characterize the microbial flora and associated antibiotic resistance seen in peritonsillar abscesses in upstate New York.

METHODS AND MATERIALS

The patient population of this study are adults and children who presented to Upstate Medical University’s Emergency Department, were evaluated by the Otolaryngology Service, and diagnosed with a peritonsillar abscess. The diagnosis of a peritonsillar abscess was confirmed by needle aspiration, incision and drainage or quincy tonsillectomy with return of purulence.

Internal institutional review board approval was obtained prior to this study. The medical records were reviewed of all patients at the State University of New York Upstate Medical University hospital who were diagnosed with a peritonsillar abscess by the Department of Otolaryngology from 2002 through 2012. All patients who did not undergo drainage of their abscesses were excluded. All patients who did not have cultures taken from their abscess pocket were excluded.

Medical records for each patient were reviewed to look at a primary end point of microbial flora and the antibiotic susceptibilities and sensitivities from the cultures obtained from the abscess. Secondary endpoints included immune compromise, complications, recurrence, and medical comorbidities. Antibiotic resistance was determined by the hospital’s microbiology lab, using the minimum inhibitory concentration. Those pathogens whose minimum inhibitory concentration was not consistent with intermediate, were not considered to have antibiotic resistance.

RESULTS

The patient gender was evenly split between male and female (table 1). Immune compromise was uncommon, only seen in 5.79%, and was due to chemotherapy. Medical comorbidities were also uncommon, with asthma and diabetes being the most common. A prior peritonsillar abscess was found in 18.84% of the cohort. Standard transoral incision and drainage was the most common drainage procedure, and done in 69.57% of the cohort. A quincy tonsillectomy was performed in 28.98% of the cohort. A needle aspiration alone was done in 1.45%. More than one drainage procedure was done in 10.01% of the patients. There were no complications due to the abscess or drainage procedures. Of note, 30.4% of these peritonsillar abscesses demonstrated involvement of the parapharyngeal space and 14.49% had involvement of the retropharyngeal spaces.

The path of peritonsillar abscesses were polymicrobial (table 2). No growth on culture after 5 days was uncommon. The most common pathogens were beta hemolytic Streptococcus, alpha hemolytic Streptococcus, or Neisseria and Haemophilus. Antibiotic resistance was relatively uncommon overall (table 3). Only Staphylococcus, alpha hemolytic Streptococcus and Streptococcus milleri demonstrated resistance to antibiotics. Oxacillin resistance and penicillin resistance were seen only in Staphylococcus. Both erythromycin and clindamycin resistance were seen in Staphylococcus, alpha hemolytic Streptococcus and Streptococcus milleri.

DISCUSSION

In our study 62% of the abscesses were polymicrobial. Literature varies in terms of whether monomicrobial or polymicrobial infections are more common in peritonsillar abscesses, with some studies stating monomicrobial is more common and others stating up to 77% are polymicrobial.

The most common bacteria was beta hemolytic Streptococcus, specifically Group A, which agrees with prior studies, which report up to 67% of peritonsillar abscesses aspirates being positive for group A beta hemolytic Streptococcus. Alpha hemolytic Streptococcus was the next most common, which includes Streptococcus viridans, occurring in 21% of peritonsillar abscesses in our study. Up to 11-32% of peritonsillar abscesses are positive for alpha hemolytic Streptococcus, which agrees with our results. However, there are studies that report Fusobacterium and Prevotella being more common in peritonsillar abscesses than shown by our data. This may be because not all specimens in our study were sent for anaerobic specific cultures. Also, patients with odontogenic sources of oral cavity abscesses which has spread to the peritonsillar space were excluded as their infections were not an isolated peritonsillar space abscess and odontogenic abscesses are commonly due to Bacteroides and Prevotella. This is why the possibility of anaerobic bacteria is low and anaerobic specific cultures were not sent on a routine basis. Smoking, seasonal variation, prior antibiotic therapy, age, gender, geographic variations, immunodeficiencies and periodontal disease are reported to affect the microbial flora. In this study, there was a large enough patient population to control for smoking, seasonal variation, or immunodeficiencies.

In terms of antibiotic resistance, penicillin resistance was seen in 37.5%, of Staphylococcus, comprising 3 peritonsillar abscesses. A 37.5% penicillin resistance rate in Staphylococcus is similar to what is reported in the literature, with a range of 0 to 42%. There is debate as to how common penicillin resistance is in peritonsillar abscesses, ranging from 0 to 68% and there are patients with parapharyngeal or parapharyngeal space involvement included in this study. The majority of penicillin resistance reported appears to be due to beta lactamase production. The presence of clindamycin and erythromycin resistance in Staphylococcus and Streptococcus seen in this study is also demonstrated by prior studies.

CONCLUSIONS

Peritonsillar abscesses are most commonly polymicrobial, with beta and alpha hemolytic Streptococcus, Neisseria and Streptococcus milleri, as the most prevalent pathogens. Antibiotic resistance to clindamycin and erythromycin is common across Streptococcal strains and Staphylococcal strains, and penicillin resistance is also common in Staphylococcal strains responsible for peritonsillar abscesses. Thus, given the higher incidence of Streptococcal strains compared to Staphylococcal strains, initial therapy with a penicillin derivative seems a more prudent course, until cultures return.

REFERENCES