Braz J Otorhinolaryngol. 2017;xxx(xx):xxx–xxx

Brazilian Journal of
OTORHINOLARYNGOLOGY
www.bjorl.org

ORIGINAL ARTICLE

Bacteriology of peritonsillar abscess: the changing trend and predisposing factors☆

Yi-Wen Tsai[a], Yu-Hsi Liu[b], Hsing-Hao Su[b,*]

[a] Kaohsiung Veterans General Hospital, Department of Medical Education and Research, Kaohsiung, Taiwan
[b] Kaohsiung Veterans General Hospital, Department of Otorhinolaryngology, Head and Neck Surgery, Kaohsiung, Taiwan

Received 1 May 2017; accepted 16 June 2017

KEYWORDS
Anaerobic bacteria;
Bacterial infections;
Klebsiella pneumoniae;
Peritonsillar abscess;
Viridans streptococci

Abstract
Introduction: Peritonsillar abscess (PTA) is the most common deep neck infection. The infectious microorganism may be different according to clinical factors.
Objective: To identify the major causative pathogen of peritonsillar abscess and investigate the relationship between the causative pathogen, host clinical factors, and hospitalization duration.
Methods: This retrospective study included 415 hospitalized patients diagnosed with peritonsillar abscess who were admitted to a tertiary medical center from June 1990 to June 2013. We collected data by chart review and analyzed variables such as demographic characteristics, underlying systemic disease, smoking, alcoholism, betel nut chewing, bacteriology, and hospitalization duration.
Results: A total of 168 patients had positive results for pathogen isolation. *Streptococcus viridans* (28.57%) and *Klebsiella pneumoniae* (23.21%) were the most common microorganisms identified through pus culturing. The isolation rate of anaerobes increased to 49.35% in the recent 6 years ($p = 0.048$). Common anaerobes were *Prevotella* and *Fusobacterium* spp. The identification of *K. pneumoniae* increased among elderly patients (age > 65 years) with an odds ratio (OR) of 2.76 ($p = 0.03$), and decreased in the hot season (mean temperature > 26 °C) (OR = 0.49, $p = 0.04$). No specific microorganism was associated with prolonged hospital stay.
Conclusion: The most common pathogen identified through pus culturing was *S. viridans*, followed by *K. pneumoniae*. The identification of anaerobes was shown to increase in recent years. The antibiotics initially selected should be effective against both aerobes and anaerobes. Bacterial identification may be associated with host clinical factors and environmental factors.

☆ Please cite this article as: Tsai Y-W, Liu Y-H, Su H-H. Bacteriology of peritonsillar abscess: the changing trend and predisposing factors. Braz J Otorhinolaryngol. 2017. http://dx.doi.org/10.1016/j.bjorl.2017.06.007
* Corresponding author.
E-mail: shsu@vghks.gov.tw (H.H. Su).
Peer Review under the responsibility of Associação Brasileira de Otorrinolaringologia e Cirurgia Cérvico-Facial.

http://dx.doi.org/10.1016/j.bjorl.2017.06.007

PALAVRAS-CHAVE
Bactérias anaeróbicas;
Infecções bacterianas;
Klebsiella pneumoniae;
Abscesso peritonsilar;
Viridans streptococci

Bacteriologia do abscesso peritonsilar: tendência de mudança e fatores predisponentes

Resumo
Introdução: O Abscesso Peritonsilar (APT) é a infecção cervical profunda mais comum. O microrganismo infeccioso pode ser diferente de acordo com os fatores clínicos.
Objetivo: Identificar o principal agente causador do abscesso peritonsilar e investigar a relação entre o patógeno causador, os fatores clínicos do hospedeiro e a duração da hospitalização.
Método: Este estudo retrospectivo incluiu 415 pacientes hospitalizados diagnosticados com abscesso peritonsilar que foram internados em um centro médico terciário de junho de 1990 a junho de 2013. Coletamos dados através da análise dos arquivos médicos dos pacientes e analisamos variáveis como características demográficas, doença sistêmica subjacente, tabagismo, alcoolismo, hábito de mascar noz de betel, bacteriologia e duração da hospitalização.
Resultados: Um total de 168 pacientes apresentaram resultados positivos para isolamento de patógenos. *Streptococcus viridans* (28,57%) e *Klebsiella pneumoniae* (23,21%) foram os microrganismos mais comuns identificados pela cultura da secreção. A taxa de isolamento de anaeróbios aumentou para 49,35% nos últimos 6 anos ($p = 0,048$). Os anaeróbios comuns foram *Prevotella* e *Fusobacterium spp*. A identificação de *K. pneumoniae* aumentou em pacientes idosos (idade > 65 anos) com razão de chances (*Odds Ratio* - OR) de 2,76 ($p = 0,03$) e diminuiu na estação do calor (temperatura média > 26 °C) (OR = 0,49, $p = 0,04$). Nenhum microrganismo específico foi associado à hospitalização prolongada.
Conclusão: O patógeno mais comumente identificado através da cultura de secreção foi *S. viridans*, seguido por *K. pneumoniae*. A identificação de anaeróbios mostrou ter aumentado nos últimos anos. Os antibióticos selecionados inicialmente devem ser efetivos contra aeróbios e anaeróbios. A identificação bacteriana pode estar associada a fatores clínicos e fatores ambientais do hospedeiro.

Introduction

Peritonsillar abscess (PTA), or quinsy, is the most common deep neck infection.[1] The abscess may spread into the parapharyngeal space of other deep neck spaces, to the adjacent structure, and to the bloodstream. It rarely occurs but PTA is potentially life threatening. Early diagnosis of PTA is extremely crucial, and appropriate antibiotics and surgical intervention to remove the abscess are required.[2] Antibiotics result in a substantial reduction in the progression of this disease. The empirical antibiotic used should be effective against the possible causative pathogen of PTA.

Our objectives were to investigate the microbiology of PTA and to identify its relationship with clinical variables including the underlying systemic disease of patients; habits such as smoking, alcoholism, and betel nut chewing; and hospitalization duration.

Methods

Study design and sample population

This retrospective study included 415 patients with PTA who were admitted to a tertiary medical center located in Southern Taiwan from June 1990 to June 2013. Inclusion criteria were hospitalized patients who were clinically diagnosed with PTA (ICD-9 code 475) by positive pus aspiration or computed tomography (CT) imaging. We reviewed the chart of each patient to collect the following data: admission date, age, sex, height, weight, host clinical factors (diabetes mellitus [DM], hypertension, smoking habit, alcoholism, and betel nut chewing), pus culture result, antibiotic treatment, surgery, and hospitalization duration. The study was approved by the institutional review board.

We classified the bacteria into different categories according to the characteristics of Gram staining and anaerobic properties. We defined prolonged hospitalization as hospitalization duration of more than 6 days. Obesity was defined as a body mass index of more than 27, and elderly patients were defined as those aged older than 65 years. We defined the hot season as the months from May to October when the average temperature in Southern Taiwan was above 26 °C according to the record of the Central Weather Bureau of R.O.C.

Statistical analysis

All data were analyzed using the SPSS statistical software (IBM Corp., Armonk, NY, USA), except for the Cochran–Armitage test, which was performed using the SAS program (SAS Institute, Cary, NC, USA). The association with each independent variable was statistically analyzed among the different groups. Categorical variables were compared using the Pearson's Chi-square test or the Fisher's exact test, as appropriate. Odds ratios (ORs) and their 95% confidence intervals (CIs) were calculated. Trends of isolated pathogens