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Throat Culture for *Streptococcus pneumonia* among healthy carrier in Al Majmaah city

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Abstract
Streptococcus pneumoniae, is anaerobic non-spore forming gram positive bacteria with oval/lancet-shaped cocci, they are often arranged in pairs, known as a diplococcus, Culture grows on blood agar, where it forms round facultative colonies surrounded by α-hemolysis Footnote.
The aim of this study was to determine the incidence of S. Pneumoniae isolated from the throat of healthy carrier and study it's antimicrobial susceptibility to estimate the resistance pattern among the students of applied medical science in Al Majmaah university, girls department.
This study was conducted in Medical applied science college in Al Majmaah University during October - November 2014. Informed consent was taken from each student in this study. Inclusion criteria of this study were students aged 17- 23 year, this criteria has been used depending on the ages of the students in medical laboratories department the college.
A total of 72 healthy students between 19-23 years of age were sampled in October- November 2014 in Medical Applied science/ medical laboratories girls department of Al Majmaah university. in the present study the carriage rate of S. pneumoniae was found to be 57 (86 %) in the throat of healthy students, of the 57 isolates 29 (55.6%) showed intermediate resistance to pencillin and 14 (24.6%) were susceptible. The susceptibilitiy pattern of the 57S.pneumoniae isolated to other four antimicrobial agents was 14% for penicillin and the highest resistance was 43% for Tetracyclin.
This study analyzed the prevalence and the susceptibility tests of S. pneumonia *in the throat of healthy students 19-23 years, as it is uniformly susceptible for pneumococci, the studies like this are very important, especially for choosing empirical therapy, and it must be continue.*
Keywords: *anaerobic, multidrug resistance, morbidity, mortality, healthy carrier.*

Introduction

Streptococcus pneumoniae, is anaerobic non-spore forming gram positive bacteria with oval/lancet-shaped cocci, they are often arranged in pairs, known as a diplococcus, Culture grows on blood agar, where it forms round facultative colonies surrounded by α-hemolysis Footnote[1,2].

It is a major cause of illness the in populations developing and developed countries[3] , it can be transmitted by person to person or by contact with respiratory secretions through directly contact.[1] or by sneezing, coughing[4]. *S. pneumonia* colonized the nasopharynx and throat of (5-10%) of healthy adults and (20-40%)

children without any effects[4]. Louis Pasteur was the first one who identified *S. pneumoniae* in 1881[5], he named this bacteria septicemique du salive, but at the same time George Sternberg named it Micrococcus pasteuri in USA[5], in 1926 this was identified as Diploccocus pneumonia due to the Gram-stained appearance[5] and finally it renamed to the present day name Streptococcus pneumoniae in 1974[5].

S. pneumoniae colonizes the mucosal of the nasopharynx and upper respiratory tract as a normal flora in healthy people. The inflammation's symptom appear as if the bacteria transfer into the sterile parts of the lower respiratory tract [6].

It isalso the main responsible to otitis media and community acquired pneumonia, when *S. pneumoniae* migrates to the lungs, it can cause pneumonia, bacterimia or septicemia when it enters the blood stream. if the colony of *S. pneumonia* were out of control in the lung, meninges, or middle ear it will cause pneumococcal lysis, which can cause inflammation. the Mortality rate of pneumococcal pneumonia is about5–10% despite the treatment with antimicrobial agents. pneumococcal bacteremia has the higher mortality rate among the patients, and it has been approximately 25–29% during the past four decades. and it is an important cause of bacterial co-infection in patients with influenza wich can increase the morbidity and mortality in these patients[7,8,9]. The emergence of highly multidrug resistance *S. pneumoniae* strains has rised worldwide. The healthy carrier of these strains can increase the prevalence of resistant strains in the community[10].

The aim of this study was to determine the incidence of *S. Pneumoniae* isolated from the throat of healthy carrier and study it's antimicrobial susceptibility to estimate the resistance pattern among the students of applied medical science in Al Majmaah university, girls department.

Materials and Methods

Study site

This study was conducted in Medical applied science in the University of Al Majmaah, during October - November 2014. Informed consent was taken from each student in this study. Inclusion criteria of this study were students aged 19- 23 year.

Sampling

We ask each student to open her mouth and tilt her head back. If necessary, a tongue depressor may be used to allow the sampler a better view of the back of the throat. Then sterile cotton swab will rubbed across the back of the throat, The swab will collect a sample of the secretions being produced in the back of the throat.

because the back of the throat is a sensitive area, The test may cause momentary gagging, but it should not be painful, The samples which has been collected is taken to a laboratory, where it is put on a blood Agar plate using streaking method and then incubated an aerobically at37°Cwith 5% CO_2 for 24-48h, large and mucoid colonies of *S. pneumoniae* appears. All isolated bacteria were identified using the standard procedures and the antimicrobial susceptibility was performed using Mueller-Hinton 5% sheep blood agar was used for susceptibility testing and the plates were incubated in 5% CO2 incubator at 37°C for 20-24 hours, according to the guidelines of the national committee for clinical laboratory standards (NCCLS) by using Kirby-bauer disc diffusion method [11].

The isolates were screened for susceptibility to penicillin using 1µg Pencillin disks. Isolates with zones of inhibition of ≥20mm were considered susceptible to penicillin[12]. Antibiotic disks tested also include erythromycin 15µg, Tetracyclin 30µg, Ciprofloxacin5µgand Clarithromcin 15µg.

Results and Discussion

A total of 72 healthy students between 19-23 years of age were sampled in October- November 2014 in Medical Applied science/girls department of Al Majmaah University. In the present study

the carriage rate of *S. pneumoniae* was found to be 57 (86 %) in the throat of healthy students, of the 57 isolates 29 (55.6%) showed intermediate resistance to pencillin and 14 (24.6%) were susceptible. The susceptibilitiy pattern of the 57 *S. pneumoniae* isolated to other four antimicrobial agents are summarized in table 1.

Table 1 Susceptibility pattern of the *S. pneumoniae* isolates from Students of Al Majmaah University, KSA

Antibiotics	No. of isolates tested	Absolute No (%) of isolates		
		Sensitive	Intermediate	resistant
penicillin	57	14(24.5%)	29(51.0%)	14 (24.5%)
Erythromycin	57	14 (24.5%)	7 (12.2%)	36 (63.3%)
Ciprofloxacin	57	13 (22.8%)	7 (12.2%)	37 (65.0%)
Tetracyclin	57	7 (12.2%)	7 (12.2%)	43 (75.4)
Clarithromycin	57	37 (65.0)	3 (5.2%)	17 (29.8%)

The highest resistance among used antibiotics was observed against Tetracyclin Similar results were observed among studies from India[13-16]. Penicillin resistance was seen among 24.5% isolates in our study which was higher than study carried out in northern India[15]. showing 18% throat isolates. Penicillin resistance varying from 7.3 – 34% has been reported from south India[13,14]. It is, therefore, necessary to have a continuous monitoring of the resistance pattern of the pneumococcal isolates in a particular geographic region.

In conclusion, this study analyzed the prevalence and the susceptibility tests of *S. pneumoniae*in the throat of healthy students 19-23 years, as it is uniformly susceptible for pneumococci, the studies like this are very important, especially for choosing empirical therapy, and it must be continue.

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