STUDY TO ANALYZE THE DRUG SENSITIVITY PROFILE OF THE PATIENTS SUFFERING FROM SORE THROAT: AN OBSERVATIONAL STUDY.

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Abstract

Aim: to analyze the drug sensitivity profile of the patients suffering from sore throat.

Materials and Methods: The present prospective observational study was conducted in the Department of ENT, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar. Among 200 patients of either gender and of any age group attended the OPD of the ENT presented with the complaint of sore throat, throat pain, throat irritation, throat itching and foreign body sensation were recruited. A thorough ENT examination is done including ear examination, throat examination, and nasal examination. Throat swab samples collected through a sterile culture sensitivity tube and sent to microbiological lab and culture sensitivity reports collected from the patients during follow up visits.

Results: majority of the patients were male 58.5% and rest 41.5% were female. Gram negative organisms are detected in (70.5%), Gram positive organisms detected (21.0%), and no organism detected (8.5%) of the swab samples.

Conclusion: gram positive organisms were resistant to benzyl penicillin or ampicillin, clindamycin, ciprofloxacin or levofloxacin and sensitive to tetracycline, gentamicin, linezolid. Gram negative organisms were resistant to ampicillin, amoxycylav and sensitive to piperacillin or tazobactam, cefoperazone, amikacin, gentamicin, imipenem, cefepime, ciprofloxacin.

Keywords: culture, throat swab, gram positive, gram negative, throat infection

Introduction

Antibiotic resistance is emerging as an important public health issue,^{1,2} and overuse of antibiotics by physicians has been implicated as contributing to the problem.^{3,4} More than one-third of all antibiotics prescribed for respiratory infections are because of sore throat,¹ and one in two patients presenting to their general practitioner (GP) with these symptoms receive antibiotics.^{5,6}

Meta-analysis of randomized controlled trials of antibiotics for sore throat have shown that they only provide a small reduction in symptom severity and duration (1 day).⁷ Survey studies have shown that 1 in 5 patients taking broad-spectrum antibiotics and 1 in 12 taking narrow-spectrum antibiotics suffer side effects such as a rash or gastrointestinal upset.⁸⁻¹²

Sore throat is a common complaint in upper respiratory tract infections and may indicate infection with group A *Streptococcus* (GAS).¹³ Although GAS infections is considered an appropriate indication for antibiotic therapy, only 10% to 20% of sore throat presentations in general practice are culture positive for GAS.¹⁴⁻¹⁸ The remainder are predominantly viral. Reports from various

countries estimate that an antibiotic is prescribed in 30% to 75% of visits.¹⁹⁻²² This suggests that antibiotics are prescribed more often than necessary.

One reason for overuse of antibiotics may be current approaches to managing sore throat. Studies comparing clinical diagnosis with throat culture have shown a sensitivity of 50% to 70% and a specificity of 60% to 80%.^{16-18,23} Thus, clinical judgement may miss up to 50% of GAS infections while identifying 20% to 40% of the large number of non-GAS sore throat presentations as needing antibiotics. In view of the past observations the present study was conducted with the aim to analyze the drug sensitivity profile of the patients suffering from sore throat.

Materials and methods

Study Design

The present prospective observational study was conducted in the Department of ENT, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar. Among 200 patients attended the OPD of the ENT presented with the complaint of sore throat, throat pain, throat irritation, throat itching and foreign body sensation.

The study protocol was reviewed by the Ethical Committee of the Hospital and granted ethical clearance. After explaining the purpose and details of the study, a written informed consent was obtained.

Inclusion Criteria

- Patients of any age group and either sex
- Patients who has signed the informed consent

Exclusion criteria

- Patients taking antibiotics in the previous week or were immunocompromised.
- Patients who has not signed the informed consent
- Patients having any kind of acute and chronic systemic illness

Sample selection

The sample size was calculated using a prior type of power analysis by G* Power Software Version 3.0.1.0 (Franz Faul, Universitat Kiel, Germany). The minimum sample size was calculated, following these input conditions: power of 0.80 and $P \leq 0.05$ and sample size arrived were 200 participants.

Methodology

Detailed history obtained from study followed by clinical examination of patient is done including general physical examination and systemic examination for assessing the general condition of participants. A thorough ENT examination is done including ear examination, throat examination, and nasal examination. Throat swab samples collected through a sterile culture sensitivity tube and sent to microbiological lab and culture sensitivity reports collected from the patients during follow up visits.

Statistical analysis

The data was entered in the form of a data matrix in Microsoft Excel® and analysed statistically using IBM® SPSS® version 20.0.0. Descriptive statistics were calculated as frequencies for categorical variables and means and standard deviation for continuous variables.

Results

Table 1: demographic profile of the study population

Gender	N (%)
Male	117 (58.5%)
Female	83 (41.5%)
Age (Years)	
1-20	38 (19.0%)
21-40	71 (35.5%)
41-60	52 (26.0%)
>60	39 (19.5%)
Age (Mean $\pm$ SD)	38.16 $\pm$ 3.61

Table 2: distribution of infective organisms on the basis of gram staining

Infective organisms	N (%)
Gram Negative (Pseudomonas aeruginosa, Klebsiella pneumonia, Escherichia coli etc.)	141 (70.5%)
Gram Positive (Staphylococcus aureus, Staphylococcus epidermidis etc.)	42 (21.0%)
No Growth detected	17 (8.5%)
Total	200 (100.0%)

Table 3: drug sensitivity profile of gram positive and negative organisms

Variables	Sensitive	Resistant	Total
Gram Positive			
Benzyl Penicillin	2	35	37
Tetracycline	33	2	35
Gentamicin	34	4	38
Clindamycin	9	29	38
Linezolid	36	0	36
Ciprofloxacin	6	29	35
Gram Negative			
Ampicillin	1	34	35
Tazobactam	94	4	98
Amikacin	92	1	93
Meropenem	94	1	95
Gentamicin	96	2	98
Ciprofloxacin	91	3	94
Amoxyclav	44	52	96

Discussion

Respiratory tract infection is considered as one of the major public health problems and a leading cause of morbidity & mortality in many developing countries. *Streptococcus pyogenes* is one of the commonest bacterial pathogens that cause acute throat infection among school-aged children living in lower socio-economic conditions.²⁴ These Gram positive cocci are distributed worldwide and have been associated with a variety of sequelae such as impetigo, otitis media, necrotizing fasciitis, glomerulonephritis, acute rheumatic fever or rheumatic heart disease.²⁵

Antibiotic resistance is rising to dangerously high levels in all parts of the world. New resistance mechanisms are emerging and spreading globally, threatening our ability to treat common infectious diseases. Throat infections are one of the major causes of antibiotic resistance as over the counter use of medications in patients with ear discharge is prevalent in the area of study.

In our study gram positive organisms were resistant to benzyl penicillin or ampicillin, clindamycin, ciprofloxacin or levofloxacin and sensitive to tetracycline, gentamicin, linezolid. Gram negative organisms were resistant to ampicillin, amoxyclav and sensitive to piperacillin or

tazobactam, cefoperazone, amikacin, gentamicin, imipenem, cefepime, ciprofloxacin.

Similar results were observed in a study by Sridevi et al while studying the prevalence of various microorganisms from throat swab specimens in patients attending a tertiary care hospital at Chinakakani, which shows that the susceptibility patterns varied depending on the drugs.²⁶ In a similar study Wakode et al studied 305 throat swab reports and found that isolated bacteria in throat swabs were found to be sensitive with cefotaxime, tetracycline, penicillin and gentamicin.²⁷

Conclusion

Every microorganism has its own sensitivity and resistance profile towards a particular antibiotic. Patient should be prescribed best drug after going through these microbiological sensitivity/resistance test of their throat isolates, in order to avoid drug overuse and chances of development of drug resistant strains.

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