

Original Research Article

Assess the outcome of pre and postoperative bacterial culture in sinonasal polyposis cases under FESS

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ABSTRACT

Background: Sinonasal polyposis is multifactorial condition characterised by mucous membrane lesions in nose and paranasal sinuses. Pre and post-operative management of cases undergoing functional endoscopic sinus surgery (FESS) give ideal surgical outcome. This study designed to assess pre and postoperative bacterial profile in sinonasal polyposis cases undergoing Functional endoscopic sinus surgery.

Methods: A total 100 cases ready for endonasal endoscopic surgery with chief complaints of sinonasal polyposis were recruited for the study. Pre and post-operative nasal swabs were collected from lateral wall, floor and area over the polyps. Sensitivity test was performed by using commonly available antibiotics i.e. ceftriaxone, erythromycin, ampicillin, gentamycin, ciprofloxacin, cephalexin, doxycycline and co-trimoxazole.

Results: Pre-operative bacterial culture showed growth of *Staphylococcus* coagulase negative (CONS) in 32% cases, *Staphylococcus aureus* in 24%. Post-operative bacteria culture showed *Staphylococcus* coagulase negative (CONS) in 22% cases, *Staphylococcus aureus* in 22% cases. *Staphylococcus* coagulase negative (CONS) and *Staphylococcus aureus* had resistance to Ampicillin and Gentamycin.

Conclusions: *Staphylococcus* coagulase negative (CONS) and *Staphylococcus aureus* are isolated commonly in pre and post-operative bacteria culture. Ampicillin, gentamicin, cefotaxime and ceftriaxone are primary choice for intravenous antibiotics in current clinical practice and in all surgical procedures including endoscopic sinus procedures.

Keywords: Sinonasal polyposis, Functional endoscopic sinus surgery, Antibiotic sensitivity, *Staphylococcus* coagulase negative, *Staphylococcus aureus*

INTRODUCTION

Sinonasal polyposis (NP) are mass like lesions from mucosa of nose and paranasal sinuses usually accompany allergic rhinitis.¹ NP is gelatinous and freely movable, often associated with chronic inflammation of nose and sinuses.² NP affects quality of life of cases and its management is a challenging task for otolaryngologists. Sinonasal polyps are associated with several conditions and pathological conditions i.e. infection, allergic fungal sinusitis, allergy and cystic fibrosis.³

Functional endoscopic sinus surgery (FESS), is a surgical choice for nasal related complications which helps to restore normal sinus function and anatomy.⁴ Ideal pre and post-operative outcome not only depends on surgical technique but also on pre and post-operative medical management.⁵ Preoperative use of antibiotics in FESS for sinonasal polyposis is to prevent associated infections, whereas postoperative management will be different which aim to prevent infection and bring back to the normal condition.⁶

This study aimed to assess the pre and postoperative bacterial profile in sinonasal polyposis cases undergoing Functional endoscopic sinus surgery.

METHODS

The present study was carried out in Department of ENT, MNR Medical College, Sangareddy and Maheshwara Medical College, Patancheru in the period of March 2017 to June 2018. A total 100 cases ready for endonasal endoscopic surgery with chief complaints of sinonasal polyposis were recruited for the study.

Inclusion criteria: Cases with sinonasal polyps, undergoing endoscopic sinus surgery.

Exclusion criteria: Cases not willing to participate, post-operative middle meatus revision FESS and other associated complications i.e. nasal obstruction, and discharge were excluded.

Informed consent was obtained from all the participants and the study protocol was approved by institutional ethics committee. Detailed clinical history was collected from all the cases and all cases were subjected to complete haemogram. Pre and post-operative nasal swabs were collected from lateral wall, floor and area over the polyps. To check bacterial profile and sensitivity, all collected swabs are cultured in Department of Microbiology. Sensitivity test was performed by using commonly available antibiotics i.e. ceftriaxone, erythromycin, ampicillin, gentamycin, ciprofloxacin, cephalixin, doxycycline and co-trimoxazole. Study data was extracted in to Microsoft office excel sheet and calculated the percentages.

RESULTS

Among 100 cases majority were belongs to second to fifth decade (Figure 1). Among the participants males were more than females.

Pre-operative bacterial culture showed, *Staphylococcus* coagulase negative (CONS) in 32% cases, *Staphylococcus aureus* in 24% cases and gram -ve

bacteria i.e. *Pseudomonas aeruginosa* in 10%, *Klebsiella pneumoniae* in 12%, *Klebsiella ozenae* in 8%, *Escherichia coli* in 8% cases. Post-operative bacteria culture showed CONS (22%), *Staphylococcus aureus* (22%) and gram -ve bacteria i.e. *Pseudomonas aeruginosa* in 6%, *Klebsiella pneumoniae* in 9% cases (Table 1).

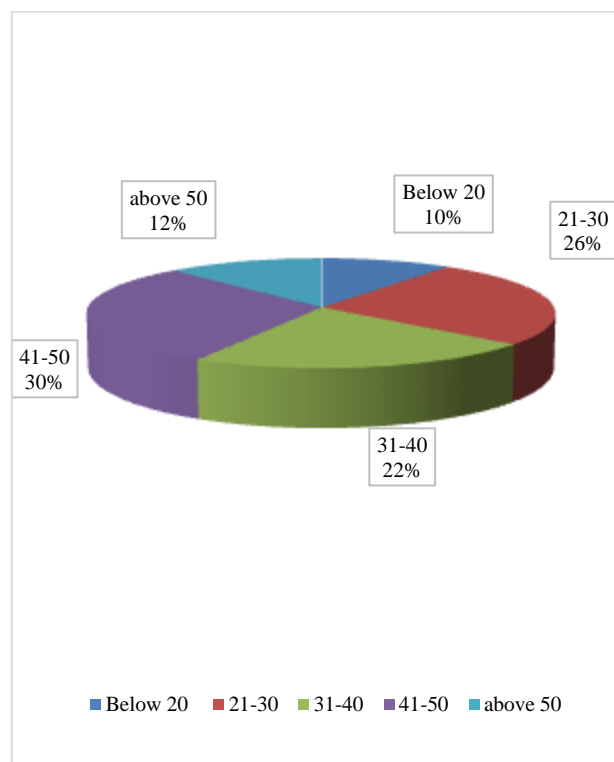


Figure 1: Age wise distribution of all cases.

Antibiotic sensitivity (pre-operative) for CONS showed high resistance for ampicillin, gentamycin and cephalixin in al microbial culture mediums (Table 2). Antibiotic sensitivity of pre and post-operative cases for *Staphylococcus aureus* showed high resistance gentamycin and ampicillin and high sensitivity to ceftriaxone, ciprofloxacin and Cephalixin (Table 3).

Table 1: Results showing pre and post-operative bacterial culture details.

Bacteria	Pre-operative bacterial culture		Post-operative bacterial culture	
	Total cases	Percentage	Total cases	Percentage
<i>Staphylococcus coagulase negative (CONS)</i>	32	32	22	22
<i>Staphylococcus aureus</i>	24	24	22	22
<i>Pseudomonas aeruginosa</i>	10	10	06	6
<i>Klebsiella pneumoniae</i>	12	12	09	9
<i>Klebsiella ozenae</i>	08	8	05	5
<i>Escherichia coli</i>	08	8	03	3
No growth	06	6	33	33

Table 2: Results of antibiotic sensitivity for CONS in pre and post-operative bacterial culture (gram +ve).

Antibiotics	Pre-operative (n=32)		Post-operative (n=22)	
	Resistant	Sensitive	Resistant	Sensitive
Ceftriaxone	11	21	14	08
Erythromycin	01	31	05	17
Ampicillin	30	02	20	02
Gentamycin	29	03	21	01
Ciprofloxacin	05	27	04	18
Cephalexin	28	04	20	02
Doxycycline	08	24	03	19
Co-trimoxazole	10	22	01	21

Table 3: Results of antibiotic sensitivity for *Staphylococcus aureus* in pre and post-operative bacterial culture (gram +ve).

Antibiotics	Pre-operative (n=24)		Post-operative (n=22)	
	Resistant	Sensitive	Resistant	Sensitive
Ceftriaxone	00	24	02	20
Erythromycin	04	20	05	17
Ampicillin	22	02	18	04
Gentamycin	23	01	21	01
Ciprofloxacin	00	24	00	22
Cephalexin	00	24	00	22
Doxycycline	04	20	04	18
Co-trimoxazole	06	18	02	22

DISCUSSION

Sinonasal polyps develop in association with sinus infection, which shows a purulent nasal discharge composed with eosinophils. Polyps are swellings with shiny and movable mucosal extensions from ethmoid sinuses or middle meatus and easily found in nasal cavity during frontal rhinoscopic examination.⁷ Sinonasal polyps are associated with several conditions and pathological conditions i.e. infection, allergic fungal sinusitis, allergy and cystic fibrosis.⁸ Studies suggested that cultures of polyps showed *Streptococcus*, *S. aureus*, *S. albus* and *Aerobacter aerogenes* and another study found *Blastomyces dermatitidis* in a culture of chronic nasal polyps cases.^{9,10} This study designed to assess the pre and postoperative bacterial profile in sinonasal polyposis cases undergoing Functional endoscopic sinus surgery. Study comprise one hundred cases belongs to 2nd to 5th decade of both sexes with male dominance (Figure 1).

Results of pre-operative bacterial culture showed growth of gram +ve bacteria i.e. CONS in 32% cases, *Staphylococcus aureus* in 24% cases and gram -ve bacteria i.e. *Pseudomonas aeruginosa* in 10%, *Klebsiella pneumoniae* in 12%, *Klebsiella ozenae* in 8%, *Escherichia coli* in 8% cases. In 6% of cases found no growth of any kind of bacterial flora (Table 1). Post-operative bacteria culture showed CONS in 22% cases, *Staphylococcus aureus* in 22% cases and gram -ve

bacteria i.e. *Pseudomonas aeruginosa* in 6%, *Klebsiella pneumoniae* in 9%, *Klebsiella ozenae* in 5%, *Escherichia coli* in 3% cases and n growth in 33% cases (Table 1). Zernotti et al, in his study on 12 cases detected *S. aureus* (in 3 patients), *Streptococcus viridans* in 2 cases and coagulase-negative staphylococci in 2 cases, and *Pseudomonas aeruginosa*, *Enterococcus faecalis*, and *Streptococcus viridans* associated with *Corynebacterium* in 1 case each.¹¹

In this study results of antibiotic sensitivity (Pre-operative) for CONS showed high resistance for ampicillin, gentamycin and cephalexin in al microbial culture mediums. CONS showed high sensitivity to erythromycin, ciprofloxacin, Doxycycline, co-trimoxazole and ceftriaxone. Post-operative antibiotic sensitivity showed high resistance to Gentamycin, Ampicillin, Cephalexin and ceftriaxone. Whereas cases had high sensitivity to co-trimoxazole, doxycycline, ciprofloxacin and erythromycin (Table 2).

Antibiotic sensitivity (pre-operative) for *Staphylococcus aureus* showed high resistance to gentamycin and ampicillin. Cases had high sensitivity to Cephalexin, ciprofloxacin and ceftriaxone. In post-operative sensitivity analysis for *Staphylococcus aureus* showed high resistance to gentamycin and ampicillin. Whereas cases had high sensitivity to ciprofloxacin, cephalixin, co-trimoxazole and ceftriaxone (Table 3). Ampicillin, gentamicin, cefotaxime and ceftriaxone are primary

choice for intravenous antibiotics in current clinical practice and in all surgical procedures including endoscopic sinus procedures. Resistance was found to these antibiotics in a majority of bacterial culture irrespective of being pre or post-operative.

CONCLUSION

The results of this study concludes CONS and *Staphylococcus aureus* are gram +ve bacteria and *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* are gram -ve bacteria isolated commonly in pre and post-operative bacterial culture. CONS had resistance to Ampicillin and Gentamycin and had high sensitivity to erythromycin, ciprofloxacin and doxycycline. *Staphylococcus aureus* had resistance to ampicillin and gentamycin and had high sensitivity to cephalixin, ciprofloxacin and co-trimoxazole

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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