

Background

- Endoscopic transsphenoidal surgery is an emerging technique used in the removal of tumors from the pituitary gland and sellar region of the skull.¹
 - The surgeon gains access to these regions through the nose and sinus cavity using a microscope or endoscope.¹
- Infectious complications may arise following this clean-contaminated procedure.³
 - This may be associated with a high risk of central nervous system infection (CNS) thereby requiring the administration of appropriate antimicrobial prophylaxis in patients undergoing transsphenoidal surgery.⁴
- A variety of factors may increase the patient’s risk of infectious complications following transsphenoidal surgery.⁵
 - CSF leakage^{6,7,8}
 - Time in the operating room greater than two to four hours
 - Placement of reconstruction materials
 - Repeat neurosurgical procedures⁵

- Sinusitis often develops in patients undergoing endonasal endoscopic skull base surgery.⁹

- The incidence of other antimicrobial-related adverse effects such as *Clostridium difficile* infections following antibiotic prophylaxis for endonasal endoscopic skull base surgery has not been well-defined in the literature.

- While the risk factors of infectious complications following endoscopic transsphenoidal have been acknowledged, there are no guidelines for antibiotic prophylaxis for the procedure.
 - In the literature, variable approaches for antibiotic prophylaxis have been presented for similar procedures
 - Broad spectrum CNS coverage with a three-drug regimen (ceftazidime, metronidazole, vancomycin) as well as single-agent antibiotic prophylaxis have been evaluated^{10, 11}

- The use of antibiotic prophylaxis in transsphenoidal surgery tends to be practitioner specific as it is currently undefined in the literature. Therefore, we have recognized the importance of characterizing how antibiotic prophylaxis is provided at UK Hospital.

Objectives

- Primary Objective:
 - To characterize antibiotic prophylaxis in patients undergoing transsphenoidal surgery.
 - Describe the population that receives antibiotic prophylaxis for transsphenoidal surgery at UK Hospital
 - Identify antibiotic regimens used prophylactically for transsphenoidal surgery at UK Hospital.
 - Identify duration of prophylactic antibiotic use for transsphenoidal surgery at UK Hospital.
- Secondary Objectives:
 - To identify risk factors for the development of infectious complications in 30 days following transsphenoidal surgery.
 - To describe the rate for infectious complications (meningitis, sinusitis, *Clostridium difficile*) in 30 days following transsphenoidal surgery.

Hypothesis

- There will be no difference in the complication rate in patients who receive outpatient antimicrobial prophylaxis compared with patients who do not receive outpatient antimicrobial prophylaxis.

Methods

- Retrospective electronic medical chart review of all adult inpatients admitted to UK Hospital who underwent transsphenoidal surgery from January 1, 2009 – December 31, 2010.
- Patient demographics collected during this study included age, gender, weight, indication for surgery, and current disease states presenting risk for infection (ex: diabetes).
- The following information will also be recorded:
 - Antibiotic (dose and regimen)
 - Corticosteroid (dose and regimen)
 - Length of stay in hospital
 - Operating room time
 - Readmission within 30 days (& cause for readmission)
 - Incidence of infection upon readmission (& culture results reported within 30 days)
 - Other complications reported
- Descriptive statistics and the Chi Square test were used in statistical analysis

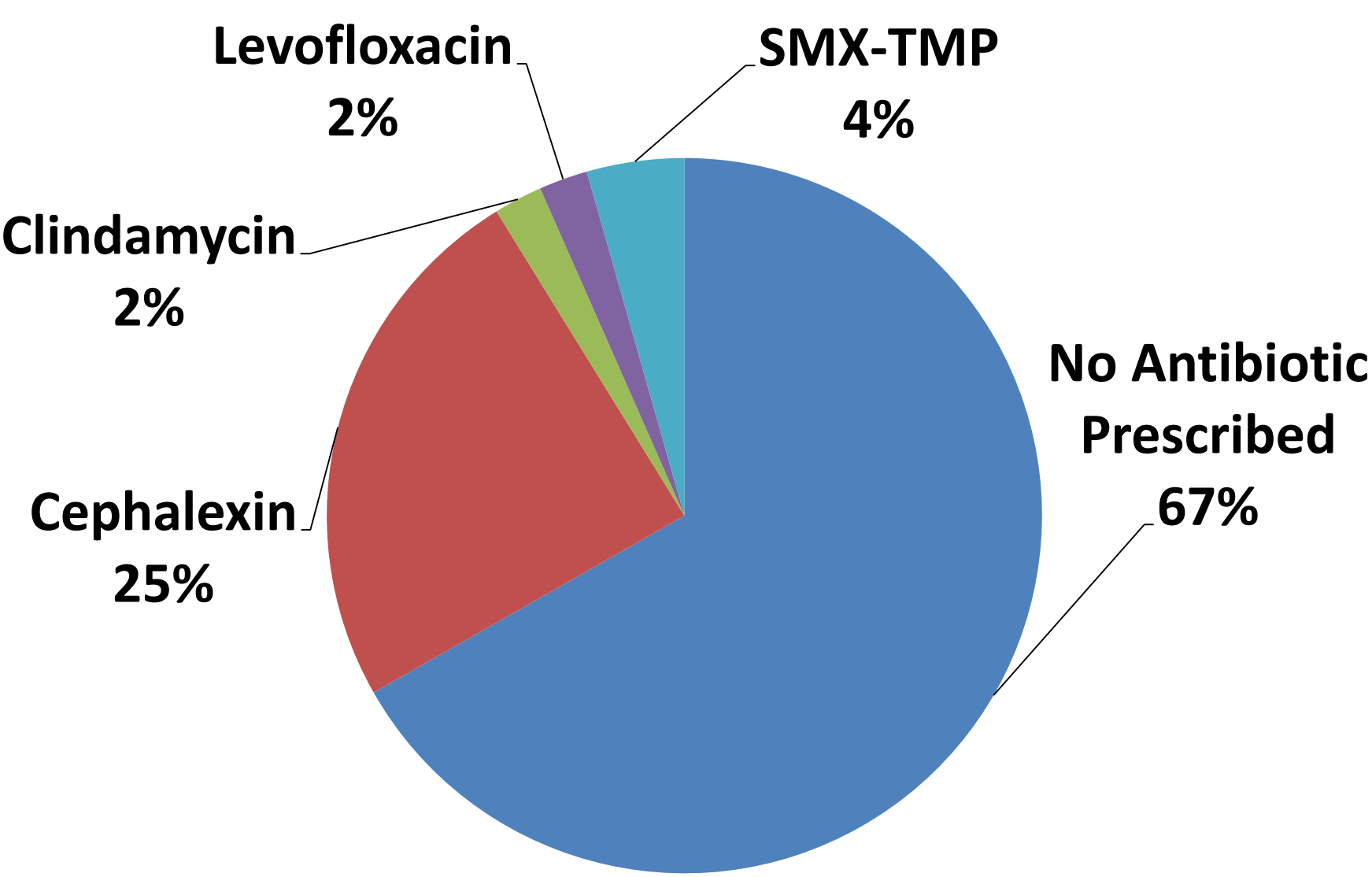
Results

Summary of Demographics	
Characteristic	Value (n=47)
Age, years [Mean (SD)]	51.1 (±14.8)
Gender, Female	59.6%
Weight (kg) [Mean (SD)]	98.0 (±28.6)
Indication for Surgery	
Pituitary Adenoma	89%
Pituitary Apoplexy	8.5%
Complications During Surgery	
CSF Leak	12 (25.5%)
Length of Stay (days), [Mean (SD)]	3.6 (± 5.5)
Antibiotic Prophylaxis (Inpatient), n(%)	44 (93.6%)
Antibiotic Prophylaxis (Outpatient), n(%)	17 (36%)
Current Disease States Present , n(%)	16 (34%)
Readmission within 30 days of surgery, n(%)	2 (4.3%)
Infection/Complications Present at Follow Up Visit, n (%)	3 (6.3%)

Impact of Outpatient Antibiotic Prophylaxis on Infection Rate and Readmission Rate				
	Infection Noted (%)	p value	Readmission Rate (%)	p value
Outpatient Antibiotic Prophylaxis Prescribed (n=30)	4.2%	0.84 [†]	4.2%	0.28 [†]
No Outpatient Antibiotic Prophylaxis Prescribed (n=17)	2.1%		0%	
†This analysis is based on a Chi Square test at an alpha level of 0.05. The p value is greater than 0.05, therefore, we conclude there is not a significant difference in infection rates and readmission rates for patients who receive outpatient antibiotic prophylaxis versus patients who did not.				

Results

Figure 1. Outpatient Antibiotic Prophylaxis



Impact of Outpatient Steroid on Infection Rate and Readmission Rate				
	Infection Noted (%)	p value	Readmission Rate (%)	p value
Outpatient Steroid Prescribed (n=31)	6.4%	0.84 [†]	4.2%	0.29 [†]
No Outpatient Steroid Prescribed (n=16)	0%		0%	
†This analysis is based on a Chi Square test at an alpha level of 0.05. The p value is greater than 0.05, therefore, we conclude there is not a significant difference in infection rates and readmission rates for patients who receive outpatient steroids versus patients who did not.				

Conclusion/Implications

- Post-operative infection was rare
 - No association with use of out-patient antimicrobial regimen
 - No association with use of post-operative corticosteroids
 - No impact on readmission rates within 30 days post-operatively
- No major adverse effects from out-patient antimicrobial use were noted
- Routine use of antimicrobials for prolonged duration (> 2 days) after transsphenoidal pituitary resection does not appear to have benefit
 - May be specific patient factors such as cerebrospinal fluid leak or immunosuppression that may compel prescribing of prolonged antimicrobial prophylaxis

References

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