


ORIGINAL RESEARCH

Current trend of antibiotic prescription and management for peritonsillar abscess: A cross-sectional study

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Abstract

Objective: There are no consensus guidelines for managing peritonsillar abscess (PTA) despite its prevalence. In order to devise best practice guidelines, current practice patterns must first be established.

Methods: This was a cross-sectional study, surveying Otolaryngology–Head & Neck Surgery trainees (residents and fellows) and consultant (academic and community). The primary outcome was the type and duration of outpatient antibiotic prescription. Secondary outcomes included differences in workup, management, prescription, and follow-up.

Results: There were 57 respondents to the survey; 24 (42%) trainees (residents/fellows) and 33 (58%) consultants. On average, each respondent managed an average of 15.2 (SD 11.2) PTAs within the last year. All respondents prescribed oral antibiotics, with amoxicillin–clavulanic acid being the most common (61%). Trainees prescribed amoxicillin–clavulanic acid more often than consultants ($n = 21, 88\%$ vs $n = 14, 42\%$, $P = .0084$), respectively. Duration of antibiotic therapy ranged from 5 to 14 days. Most commonly, a 10-day course of antibiotics was prescribed ($n = 31, 54\%$). Regarding the management of PTAs, a majority of respondents requested blood work ($n = 39, 68\%$), performed needle aspiration ($n = 42, 72\%$) and performed incision and drainage ($n = 52, 91\%$). Culture and sensitivity of the aspirate/drainage fluid was frequently performed ($n = 41, 72\%$). Patients were often provided non-opioid analgesics ($n = 46, 81\%$), but more than half still received prescription opioids ($n = 36, 63\%$). The majority of clinicians arranged for follow-up ($n = 42, 74\%$), most often with Otolaryngology – Head & Neck Surgery ($n = 27, 64\%$), with an average follow-up of 12.5 (SD 8.2) days.

Conclusion: We found heterogeneity in the management of PTAs, with variability in the outpatient antibiotic prescription. This study highlighted the wide range

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of management strategies employed along with differences in workup, investigation, post-discharge analgesic prescription, and follow-up arrangements.

Level of Evidence: 5.

KEYWORDS

antibiotics, management, otolaryngology, peritonsillar abscess

1 | BACKGROUND

Peritonsillar abscess (PTA) represents the most common infection of the deep neck space, with a reported worldwide incidence rate ranging between 10 and 37 per 100,000 people.¹⁻⁴ The highest incidence occurs in adults between 20 and 40 years of age, but can occur in all age groups, with similar gender distribution.⁵ PTAs are most commonly secondary to complications of tonsillitis, theorized as caused by suppurative of Weber's glands. If left untreated or inadequately treated, PTAs can spread to adjacent deep neck spaces causing life threatening conditions including airway obstruction, parapharyngeal space infection, sepsis, carotid pseudoaneurysm, and even death.^{3,6}

The management of PTAs has evolved in recent years, with a majority of patients in Canada now managed on an outpatient basis.⁶ Studies reviewing the microbiology of PTAs have noted changes to the bacterial resistance patterns.⁷⁻⁹ In 2013, Sowerby et al in 2013 found high levels of organism resistance to clindamycin in London, Ontario and noted that in fact clindamycin represented the most common antibiotic prescribed to PTA patients.⁶

To the authors' knowledge, there are no consensus guidelines for the management of PTAs despite its prevalence. In order to devise best practice guidelines, current management patterns must first be established. Our objectives were firstly to examine the current antibiotic prescribing practices of physicians at a large metropolitan region in Canada in the outpatient treatment of PTAs, and secondly to capture differences in the management of PTAs, including workup, surgical drainage, outpatient prescriptions, and follow-up practice.

2 | METHODS

2.1 | Ethics

This study was considered part of a quality improvement initiative in the Department of Otolaryngology—Head and Neck Surgery, University of Toronto and received ethics exemption from the University of Toronto Research Ethics Board.

2.2 | Participants

A survey was administered on a voluntary basis to Otolaryngology—Head & Neck Surgery (OHNS) trainees (residents and fellows) and consultants (academic and community) who attended either of the

two OHNS annual update courses in Toronto, Canada held in November 2019 and February 2020. Respondents were from across Ontario, Canada, and were asked to complete the survey once if they attended both courses.

2.3 | Outcome measures

The survey is presented as a part of Appendix 1, and contains 20 questions eliciting the “typical” management of an uncomplicated PTA. The primary outcome measure was the type and duration of outpatient antibiotic prescribed. Secondary outcome measures focused on management of PTAs, and included utilization of manual palpation, nasolaryngoscopy, imaging, bloodwork, intravenous (IV) antibiotics, IV steroids, differences in drainage techniques (needle aspiration vs. incision and drainage vs. incision and drainage only with positive needle aspiration), culture and sensitivity of aspiration/drainage, prescription of analgesics, opioids, oral steroids, and arrangement of follow-up (OHNS, general practitioner, or no follow-up). Additionally, demographic information including years in practice or training, and the number of PTAs managed in the last year were captured.

2.4 | Statistical analyses

All statistical analyses were performed using Prism (V7, GraphPad), with statistical significance set to $P < .05$. Data were first collated into a spreadsheet designed specifically for the study. Descriptive statistics were used to display categorical variables frequencies and relative frequencies. Continuous variables were displayed as means with standard deviation (SD), along with range. Comparisons of categorical variables were performed using Chi-squared or Fisher's exact test. Based on parametric distribution of the continuous variables, Student's *t* test was used to capture mean differences.

3 | RESULTS

A total of 57 respondents, encompassing 33 (58%) consultant and 24 (42%) trainees completed the survey. The response rate was 38% from 151 unique registered attendees. There were 43 (75%) male respondents. The average age was 40.8 (SD 13.9) years old, range between 25 and 79 years old, with an average time in practice/training of 11.5 (SD 11.7) years, ranging from 1 to 45 years. The mean

TABLE 1 Demographic information

Characteristics	Combined (n = 57)	Trainee (n = 24)	Consultant (n = 33)	P-value
Age (years, SD, range)	40.8, SD 13.9, range 25-79	30.5, SD 3.9, range 25-37	48.8, SD 13.5, range 32-79	.0001
Gender male (n, %)	43 (75%)	18 (75%)	25 (76%)	1.00
Time in training/time in practice (years, SD, range)	11.5, SD 11.7, range 1-45	3.8, SD 1.9, range 1-6	17.1, SD 12.7, range 1-45	.0001
# PTA managed last year (n, SD, range)	15.2, SD 11.2, range 0-50	15.4 SD 12.8, range 0-50	15.0, SD 10.2, range 0-50	.84

TABLE 2 PTA management practices and differences between trainee and consultant

Management	Combined (n = 57)	Trainee (n = 24)	Consultant (n = 33)	P-value
Manual palpation (n, %)	33 (58%)	15 (63%)	18 (55%)	.60
Flexible nasolaryngoscopy (n, %)	17 (30%)	6 (25%)	11 (33%)	.57
Blood work (n, %)	39 (68%)	18 (75%)	21 (64%)	.40
IV antibiotics (n, %)	44 (77%)	19 (79%)	25 (76%)	1.00
IV steroids (n, %)	43 (75%)	20 (83%)	23 (70%)	.35
Imaging (n, %)	6 (11%)	3 (13%)	3 (9%)	.69
Needle aspiration (n, %)	41 (72%)	19 (79%)	22 (67%)	.38
Incision and drainage (n, %)	52 (91%)	22 (92%)	30 (91%)	1.00
Culture and sensitivity (n, %)	41 (72%)	18 (75%)	23 (70%)	.77
Prescribe opioids (n, %)	36 (63%)	13 (54%)	23 (70%)	.27
Prescribe non-opioids (n, %)	46 (81%)	19 (79%)	27 (82%)	1.00
Prescribe oral steroids (n, %)	9 (16%)	2 (8%)	7 (21%)	.28
Arrange follow-up (n, %)	42 (74%)	16 (67%)	26 (79%)	.37
Follow-up with OHNS (n, %)	27 (64%)	6 (38%)	21 (81%)	.0077
Follow-up time (days, SD)	12.5 (8.2)	11.7 (6.5)	13.0 (9.2)	.71

number of PTAs managed within the last year per respondent was 15.2 (SD 11.2), ranging from 0 to 50. Baseline demographics are displayed in Table 1.

All respondents (100%) reported to prescribing oral antibiotics for the outpatient management of PTAs. The most commonly prescribed antibiotic was amoxicillin-clavulanic acid, accounting for 35 (61%) prescriptions, followed by clindamycin at 20 (35%) prescriptions. Regarding duration of antibiotics, this ranged from 5 to 14 days. Most commonly, a 10-day course was prescribed (n = 31, 54%), followed by 7-day course (n = 21, 37%), 5-day course (n = 4, 9%) and 14-day course (n = 1, 2%). Comparison of the antibiotic type prescribed between trainees and consultants was statistically significant, with more trainees prescribing amoxicillin-clavulanic acid as first line antibiotics as compared to consultants (n = 21, 88% vs n = 14, 42%, $P = .0084$), respectively. There were no statistically significant difference between trainees and consultants in the duration of antibiotics prescribed ($P = .35$).

With regards to PTA management, blood work was commonly requested (n = 39, 68%), needle aspiration (n = 42, 72%) and incision and drainage (n = 52, 91%) were frequently performed. There were 21 (31%) respondents who reported only performing incision and drainage if needle aspiration was positive for purulence. Culture and

sensitivity of the aspirate/drainage fluid was performed by a majority of respondents (n = 41, 72%). Non-opioid analgesics were commonly prescribed (n = 46, 81%), but a majority of respondents prescribed opioids (n = 36, 63%). Follow-up was frequently arranged (n = 42, 74%), most often with OHNS (n = 27, 64%), with an average follow-up of 12.5 (SD 8.2) days. In comparing the management of PTAs between trainees and consultants, we noted the only statistically significant difference was that more consultants arranged for follow-up with OHNS as compared to trainees (n = 21, 81% vs. n = 6, 38%, $P = .0077$). Differences in PTA management between trainees and consultants are summarized in Table 2. Additionally, we evaluated the groups which treated 10 or fewer PTAs in the last year as compared to those who treated more than 10, and did not find any statistically significant difference in the antibiotic prescription, or the treatment and workup of PTA patients.

4 | DISCUSSION

The management of PTAs has evolved over the years and is highly variable between regions and countries. An audit of PTA management in the United Kingdom revealed that the majority of physicians (68%)

managed PTAs on an inpatient basis, whereas only 15% of PTA patients were admitted as inpatients in a recent Canadian study.^{6,10} In reviewing the antibiotic prescribing patterns and current outpatient treatment of PTAs by OHNS physicians in a large geographic region in Canada, we noted that there is a high degree of heterogeneity in the management algorithm. Practice variability is an important prerequisite for future quality improvement initiatives in the standardizing of PTA management.

The basis for the acute management of PTAs remains largely centered on investigations with blood work, medical treatment with IV antibiotics, IV steroids, and surgical drainage with needle aspiration and/or incision and drainage of the abscess. However, as we noted in the results, there is a large degree of diversity in management methods. For instance, with surgical drainage, although most of the respondents performed needle aspiration (72%), there was a subset of physicians who only performed incision and drainage in the case of positive needle aspirate (31%). Mehanna et al through their survey of OHNS consultants found that increased number of PTAs managed by an individual was associated with more incision and drainage.¹⁰ This was different from our findings, which did not show any differences in the surgical management between those that managed high number of PTAs (more than 10), versus low numbers (less than or equal to 10) in the last year.

While all of the survey respondents reported prescribing outpatient oral antibiotics, the actual prescriptions were highly variable in terms of antibiotic type and duration of therapy. The most commonly prescribed antibiotic was amoxicillin-clavulanic acid (61%), for a duration of 10 days (54%). In 2013, Sowerby et al evaluated the antibiotic prescriptions for PTAs post-drainage and local antibiotic resistance in London, Canada. They found that the most commonly prescribed antibiotic was clindamycin (69%), followed by amoxicillin-clavulanic acid (20%).⁶ Interestingly, Sowerby et al noted high rates of clindamycin resistance (32%) based on culture and sensitivity of the collected isolates. Our survey noted that trainees prescribed more amoxicillin-clavulanic acid as compared to consultants. Moreover, on additional analysis, we noted that consultants who have recently graduated, with years in practice <7 years, prescribed more amoxicillin-clavulanic acid as compared to the ones who have been in practice longer than 7 years ($P = .019$). The shift in antibiotic prescription noted for trainees and recently graduated consultants, as compared to senior otolaryngologists, may reflect changes to resident teaching based on evidence of antibiotic resistance patterns in PTAs as provided by Sowerby et al.⁶ Nevertheless, understanding the antibiotic resistance pattern across one's own institution or geographic area may serve as the first step to standardizing the management of PTAs.

A Cochrane review by Chang et al evaluated needle aspiration versus incision and drainage of PTAs. The authors concluded that despite biases within the studies reviewed, there appeared to be very-low level evidence pointing to decreased recurrence rates with incision and drainage, and less pain associated with needle aspiration.¹¹ Given the anaerobic composition of organisms found within PTAs, and the high susceptibility of anaerobic bacteria to oxygen, there are those who have theorized the act of incision and introducing oxygen into the peritonsillar space can have an antibacterial effect.¹²

The prescription of opioids was 63% as reported by our survey. Some respondents reported to prescribing as many as 30 tablets of codeine/acetaminophen. Studies have shown that the pain associated with PTA and its management was minimal, and at approximately 5 days after either needle aspiration or incision and drainage, more than 75% of patients reported no pain.^{13,14} The use of corticosteroids has also been shown to be effective in reducing pain in the first 24 hours.¹⁵ Currently, there has been increasing concerns with regards to over-prescribing of opioid medications. Specifically, within the field of OHNS, opioid prescription in Canada has been reported to be highly variable, with lack of guidelines available for post-operative opioid prescription, leading to concerns of overprescribing.¹⁶ Given the low pain levels associated with PTAs and its management, combined with the growing concern surrounding opioid use, we believe that opioid prescription can be effectively reduced in this setting.

Additionally, in the workup and management of PTAs, we noted that 30% of respondents reported to performing flexible laryngoscopy, and 11% reported to requesting imaging. While the exact reasons were not elicited in the survey, this may have been done in order to rule out complications of PTAs including parapharyngeal and retropharyngeal abscess. Moreover, we found that 72% of the respondents reported sending aspirate/drainage for culture and sensitivities. The usefulness of culturing purulence from PTA drainage has been debated, given that typically a polymicrobial mixture of aerobes and anaerobes is yielded. Tonsils of healthy individuals are typically diversely colonized, therefore making the identification of significant pathogens challenging.¹⁷

There were potential limitations to this study. Surveys were only handed out at two annual courses to attendees in person in order to increase the participation rates, yet we still encountered low rates of response. However, this response rate is similar to other published studies utilizing surveys.¹⁵ Moreover, there exists the possibility of recall bias and volunteer bias, in responding to the survey questions and willingness to participate, respectively. Lastly, only OHNS physicians were surveyed. However, around the Greater Toronto Area, and especially within community hospitals, PTAs are also managed by Emergency Physicians. Given the presence of significant practice variability, evidence-based best practice guidelines should be introduced to standardize the approach and treatment of PTAs. Future steps would be to survey physicians from across a larger geographic area, with the potential for a nationwide survey.

5 | CONCLUSION

This study was able to highlight the heterogeneity in the antibiotic prescription amongst OHNS physicians in the treatment of PTA post-drainage. It also revealed the wide range of management strategies employed, from needle aspiration to incision and drainage, to a combination of both, along with differences in workup, investigation, post-discharge analgesic prescription, and follow-up practices.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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