ORIGINAL CONTRIBUTION

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A survey on the management of acute rhinosinusitis among Asian physicians*

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SUMMARY

Background: *Based on the 'European Position Paper on Rhinosinusitis and Nasal polyps (EP³OS 2007)', this study aimed to investigate general practitioners (GPs) and other specialists' understanding when managing patients with acute rhinosinusitis (ARS) in Asia.*

Methodology: *Among a total of 2662 questionnaires completed, 2524 (94.8%) were valid for analysis. There were 1308 GPs (51.8%), 989 otolaryngologists (39.2%) and 227 paediatricians (9%) from Mainland China, Hong Kong, Indonesia, India, Malaysia, Pakistan, Philippines, Singapore, Thailand and Taiwan.*

Results: *ARS is affecting an estimated 6 - 10% of patients seen in a daily out-patient practice. The EP³OS criteria are well supported by Asian physicians (94.1%). Most physicians (62.7%) agreed that radiological investigation is not needed to diagnose ARS. However, even for mild ARS (common cold), medical treatments were still recommended by 87% of GPs, 83.9% of otolaryngologists, and 70% of paediatricians. The top three first-line treatments prescribed were antihistamines (39.2%), nasal decongestants (33.6%), and antibiotics (29.5%). Antibiotics usage increased as the first line treatment of moderate (45.9%) and severe (60.3%) ARS.*

Conclusion: *ARS is commonly managed by GPs, otolaryngologists, and paediatricians in Asia. However, understanding of the management of ARS needs further improvement to minimize unnecessary use of radiological investigations, overuse of antibiotics, and under use of nasal corticosteroids.*

Key words: acute rhinosinusitis, Asia, EP³OS, diagnosis, treatment, antibiotics, nasal corticosteroids

INTRODUCTION

Acute rhinosinusitis (ARS) is a significant health problem, being one of the top reasons for a visit to primary care clinics [(1)]. It was found that an average of 8.4 % of the Dutch population reported at least one episode of ARS per year in 1999 [(2)]. The incidence of visits to the general practitioner for acute rhinosinusitis in the Netherlands in 2000 was 20 per 1000 men and 33.8 per 1000 women [(3)]. According to data from a National Ambulatory Medical Care Survey (NAMCS) in the USA, rhinosinusitis is the fifth most common diagnosis

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for which an antibiotic is prescribed. In 2002, rhinosinusitis accounted for 9% and 21% of all paediatric and adult antibiotic prescriptions, respectively [4].

ARS is a condition characterized by inflammation of the nasal and sinus tissues, classically occurring 5 to 7 days after a viral upper respiratory tract infection (URTI) [1]. Recently, an evidence-based guideline entitled 'European Position Paper on Rhinosinusitis and Nasal polyps (EP^{3}OS in 2007)' has been published to enhance the effectiveness and quality of management for ARS patients [1,5]. However, the impact of these guidelines on the physician's management of ARS patients has not been assessed, neither in Asian countries.

The purpose of this survey study was to investigate the opinions of Asian general practitioners (GPs) and other specialists (e.g., otolaryngologists and paediatricians) when diagnosing and treating patients with primary ARS. We also wanted to determine if there was any difference in the management of ARS at the local level in Asia versus EP^{3}OS recommendations.

METHODS

The study design and questionnaire have been approved by the Institutional Review Board of the National University of Singapore.

Study questionnaire

The questionnaire was originally designed in English (Appendix 1), and a professional translation to Chinese was also provided for subjects who did not speak English in Mainland China and Taiwan. The questionnaire included information about the medical practice (e.g., type and year of practice), gender and age of the physicians surveyed, concepts or diagnostic criteria of ARS and treatment based on EP^{3}OS recommendations (the original copy of the questionnaire is attached).

Study design

A copy of the EP^{3}OS pocket guide was provided to each physician who agreed to be surveyed. The initial plan of this study was to survey primary care physicians (or GPs) who treat patients with ARS using their professional societies and existing CME (Continuing Medical Education) programs during the period of May to November 2008. An invitation letter explaining the nature of this survey was attached to each questionnaire, together with a return envelope to the principle investigator of this study. Personal data such as name, contact and mail address were treated as confidential and completion was optional for participants in the survey.

A total of 8 countries with 10 investigating sites were surveyed: Mainland China, Hong Kong, Indonesia, India, Malaysia, Pakistan, Philippines, Singapore, Thailand, and Taiwan. Due to the difference in healthcare systems governed by the medical authorities in these countries, patients with ARS may be able to visit otolaryngology or paediatric clinics directly without a referral from the primary care physicians. Because of this, otolaryngologists and paediatricians were also surveyed if they were treating ARS in a primary care setting, such as in Mainland China, Taiwan, Thailand, and India.

Statistical analysis

All statistical tests were carried out using a two-tailed method and a 5% level of significance ($p < 0.05$). The calculations were performed using the SPSS program PASW Statistical 17.0. Descriptive statistics were presented as % (n). The Chi-Square test or Fisher's Exact test was used to investigate the relationships between categorical variables. Tests were carried out to investigate the existence of relationships between different specialties (e.g., GPs, otolaryngology and paediatrician), the type of medical practice (e.g., type and years of practice, gender and age of the physicians) and their opinions in diagnosis and management of ARS (e.g., the use of antibiotics and other treatment modalities). Bonferroni adjustments were made for the pairwise comparisons.

Table 1. Summary of demographic information of the physicians surveyed in the study (n=2524).

Country/Region	Subject % (N)	Males % (N)	Age (years) (%)				Type of practice (%)			Years of practice (%)		
			<30	30-39	40-49	>50	GP	ENT	Ped	<5	5-10	>10
China (mainland)	11.1 (282)	60 (169)	5.1	32.9	40.9	21	1.0	93.9	4.9	5.7	13.2	81.1
Hong Kong	1.1 (28)	96 (27)	0	40.7	29.6	29.6	71.4	21.4	7.1	0	21.4	78.6
Indonesia	27 (682)	53 (363)	14.1	34.6	25.1	26.2	70.1	18.3	11.6	37.2	23.3	39.5
India	12.4 (313)	92 (288)	1.3	26.5	35.1	37.1	38.6	60.7	0.6	7.1	19.6	73.2
Malaysia	14.4 (364)	51 (184)	4.9	32.9	35.2	26.9	76.4	16.7	6.8	14	25.3	60.7
Pakistan	2.3 (60)	93 (56)	13.3	23.3	45	18.3	60.0	38.3	1.6	16.6	28.3	55
Philippines	10.9 (277)	35 (97)	18.9	41.1	27.4	12.6	46.6	28.9	24.5	41.5	27.4	31.1
Singapore	7.5 (189)	60 (113)	8.5	35.4	35.4	20.6	96.8	0.5	2.6	16.4	22.9	60.3
Thailand	8.1 (204)	41 (84)	31.9	43.6	15.7	8.6	17.6	74.4	8	45.9	31.3	22.7
Taiwan	4.9 (125)	94 (117)	8.4	56.5	27.5	7.6	19.1	68.7	12.2	19.1	41.2	39.6
Sub-total	**100 (2524)**	**59 (1498)**	**11.2**	**35.6**	**30.5**	**22.7**	**51.8**	**39.2**	**9.0**	**24.4**	**24.1**	**51.5**

Table 2. Percentage (%) of drugs used by physicians depending on disease severity.

Drugs	Mild ARS			Moderate ARS			Severe ARS		
	GP	ENT	Ped	GP	ENT	Ped	GP	ENT	Ped
Decongestants	87.6	89.2	96.1	79.3	83.9	87.3	77.2	87.8†	84.1
Antibiotics	72.8	89.1*	68.1	87	96.5†	83.2	92.0	96.8	97.3
Oral Antihistamines	91.7	75.1	100.0	81.9	68.1*,†	82.7	82.7	70.4	88.2
Pain relief	72.3	65.6	58.4	69.8	60.9	51.8	78.8	72.3	72.7
Nasal douche	22.9	46.1*,†	46.8	21.0‡	47.9*	38.6	24.8	51.0	39.5
Nasal corticosteroids	45.3	61.3	52.6	49.9	62.8	55.9	56.1	65.9	67.3
Topical antibiotics	16.4	19.1	14.3	13.2	17.1	11.8	13.3	18.7	14.1
Systemic steroids	32.1	28.6	24.7	33.5	29.4	22.7	42.4	40.8	34.1
Mucolytics	61.9	69.4	66.9	56.2	68.5	57.7	60.6	71.3	61.3
Herbal medicine	13.1	24.1	14.3	10.1	20.6†	13.6	10.4	19.9	10.9

There is no significant difference between gender, year of practice, or age of the physicians

*: $p < 0.05$ ENT *vs* Ped;
†: $p < 0.05$ ENT *vs* GP
‡: $p < 0.05$ Ped *vs* GP

RESULTS

Among a total of 4000 questionnaires distributed, 2662 surveys were duly completed and returned (mean response rate of 66.5%), of which 2524 (94.8%) questionnaires were valid for analysis. One hundred and thirty-eight surveys were not included for analysis due to missing information as to the type of medical practice. The details of the number of physicians surveyed at different investigational sites (countries), their gender and age distributions, the type and years of practice are listed in Table 1. Of them, 1308 (51.8%) were GPs, 989 (39.2%) otolaryngologists, and 227 (9%) paediatricians. Half of the physicians (51.5%) surveyed had more than 10 years of clinical experience.

Agreement with EP³OS's diagnostic criteria

Two thousand three hundred seventy-five (94.1%) of the physicians agreed with the diagnostic criteria for ARS recommended by the EP³OS [1]. Only 149 physicians (5.9%) felt that the recommendation could lead to over diagnosis (n = 102, 4%) or under diagnosis (n = 47, 1.9%) of ARS. There was no significant difference between the answers of GPs, otolaryngologists and paediatricians.

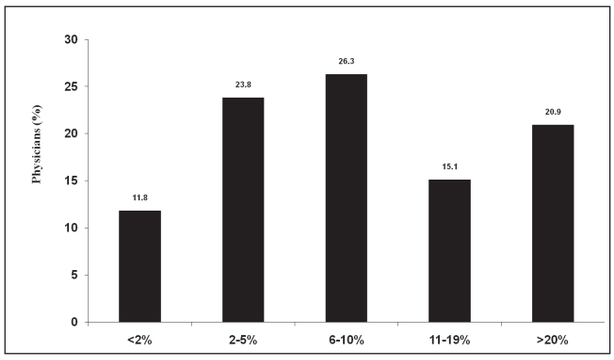


Figure 1. Incidence of acute rhinosinusitis (ARS).

The use of radiological investigations

It was recommended by EP³OS that radiological investigations (e.g., plain X-ray and CT scan) are not indicated unless additional problems are present, such as very severe disease, immunocompromised patients and/or signs of complications. This recommendation was well supported by 1847 (73.2%) of the physicians. However, for 677 (26.8%) physicians, a plain X-ray (n = 475, 18.8%) or CT scan (n = 202, 8%) was still requested.

In this survey, physicians were asked to estimate the percentage (< 2%, 2 - 5%, 6 - 10%, 11 - 19% or > 20%) of patients who had been diagnosed with ARS over a one-year period in their clinics. It showed that the overall and highest range given was 6 - 10% (Figure 1). However, 246 otolaryngologists (24.9%) indicated that more than 20% of the patients seen in their clinics were for ARS, which was higher than the GPs (n = 232, 17.8%) and paediatricians (n = 30, 13.2%). The most common

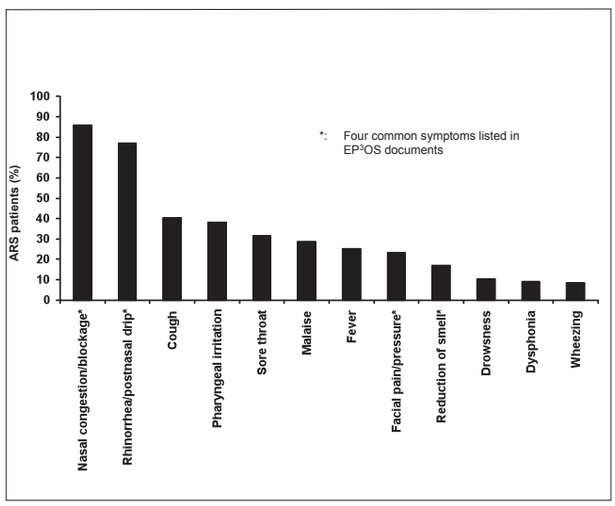


Figure 2. Most common characteristics in ARS.

Table 3. The top three drugs used as first-line treatment by physicians. There is no significant difference in respect to gender, year of practice, or age of the physicians.

Severity	Antibiotics	Oral antihistamines	Decongestants	Pain relief
Mild	29.5%	39.2%	33.6%	-
Moderate	45.9%	37.2%	32.5%	-
Severe	60.3%	37.6%	-	38.4%

presenting symptoms of ARS to physicians are listed in Figure 2.

Classifications of the severity of ARS

In EP^{3}OS, the severity of ARS is divided into mild, moderate and severe based on a total severity visual analogue scale (VAS, 0 - 10 cm): MILD = VAS 0 - 3; MODERATE = VAS > 3 - 7; and SEVERE = VAS > 7 - 10 [1]. However, in the EP^{3}OS pocket guide, a clinical classification has also been introduced in the evidence-based management scheme: MILD = common cold or symptoms less than 5 days; MODERATE = presenting symptoms worsening after 5 days or lasting for more than 10 days, but with no fever and no severe facial pain; SEVERE = presenting symptoms worsening after 5 days or lasting for more than 10 days with fever > 38°C and severe facial pain. Most physicians, 77.1% of GPs, 68.7% of otolaryngologists and 79.7% of paediatricians favoured the clinical severity classification of ARS.

Medical treatment of ARS

Based on the severity of ARS, the participants were asked to rank their choice of common medical treatments (e.g., pain relief, antibiotics, topical antibiotics, systemic corticosteroids, nasal corticosteroids, oral antihistamines, decongestants, nasal douche (washes), mucolytics, herbal medicine and others) from 1 (most often) to 10 (least often).

For patients with mild ARS, most GPs (n = 1138, 87%), otolaryngologists (n = 830, 83.9%) and paediatricians (n = 159, 70%) indicated that they would provide some type of medical treatment (Figure 3, Table 2) for their patients. There was a statistically ($p < 0.05$) more frequent use of antibiotics by otolaryngologists (89.1%) than paediatricians (68.1%). There was no statistical difference of antibiotic use between different investigational sites (countries), nor difference between physicians according to gender, year of practice or age. Nasal douche was recommended significantly less ($p < 0.05$) by GPs (22.9%) than otolaryngologists (46.1%) and paediatricians (46.8%). For patients with moderate ARS (Figure 3, Table 2), 96.5% of otolaryngologists recommended the use of antibiotics, which is statistically higher ($p < 0.05$) than GPs (87%) and paediatricians (83.2%). Oral antihistamines were more frequently ($p < 0.05$) used by paediatricians (82.7%) and GPs (81.9%) than otolaryngologists (68.1%). However, nasal corticosteroids were less commonly used than other medications by GPs (49.9%), otolaryngologists (62.8%) and

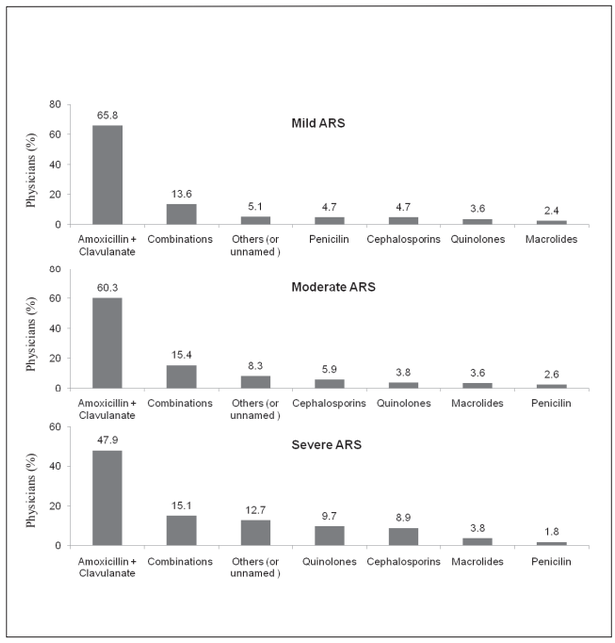


Figure 3. Use of antibiotics depending on disease severity.

paediatricians (55.9%).

For patients with severe ARS (Table 2), antibiotic treatment was the top choice for treatment provided by GPs (92%), otolaryngologists (96.8%) and paediatricians (97.3%). There was no statistical difference between the medical treatments provided by all three groups of physicians from the different investigational sites, nor any difference between physicians in regards to gender, year of practice or age.

Table 3 summarises the frequency of the top three medical treatments selected by physicians in patients with different severities of ARS. Figure 3 shows the type of antibiotics, which are recommended by physicians in mild, moderate, and severe ARS. In total, 55.6% of GPs and 57.7% of paediatricians have indicated that they would treat patients with moderate ARS and refer the patients to otolaryngologists if there was no improvement after 14 days of treatment. However, for more than 83% of the GPs and paediatricians, they would refer the patients to an otolaryngologist immediately if the symptoms are severe and especially if they showed ocular or neurological complications.

DISCUSSION

Rhinosinusitis in its various forms, constitutes one of the commonest conditions encountered in medical practice and may present to a wide range of clinicians [1]. Although the incidence of ARS is very high, ranging from acute viral (common cold) to severe bacterial rhinosinusitis, there is very limited data on the epidemiology and understanding of the management of ARS among different specialties, commonly treating ARS. Thanks to the introduction of EP^{3}OS documents, we were able to perform a multi-centre study on ARS, based on a uniformly accepted definition. Although this is not a population-proportionately stratified random sampling study, we were able to obtain large number of physicians (GPs

and other specialists) from each country, among which, their opinions on the management of ARS appear to be similar. This is the first study reporting this important healthcare issue in Asia.

From our data, 6 - 10% of the total outpatient visits are associated with ARS. Although this figure could be overestimated due to a retrospective estimation, it confirms that ARS is common in both GPs and other specialist clinics (otolaryngology and paediatrics). In general, most physicians surveyed agreed with the definition and diagnostic criteria for ARS, as suggested by the EP^{3}OS recommendations. The diagnosis of uncomplicated ARS is defined as increasing symptoms after 5 days or persistent symptoms for 10 days for less than 12 weeks in duration [1]. Radiological investigation is not recommended unless additional problems are present, such as severe symptoms, immunocompromised patients or signs of complications. However, from our survey, a number of physicians (n = 677, 26.8%) still used plain X-ray (n = 475, 18.8%) or CT scan (n = 202, 8%) on a regular basis. It could be one of the explanations that plain X-ray is still popular among the GPs and other specialists in Asia as a screening tool in clinical practice. However, the perceived need of radiological investigation results in unnecessary patient exposure to radiation and increased healthcare costs.

The most alarming finding in this study is antibiotics overusage by GPs, otolaryngologists and paediatricians in patients with ARS. Antibiotic therapy should be reserved for patients with severe symptoms who meet the criteria for clinical diagnosis of acute bacterial rhinosinusitis and for those with severe rhinosinusitis symptoms, such as unilateral facial pain and/or fever > 38ºC regardless of the duration of symptoms [6]. This practical recommendation has been reinforced by EP^{3}OS [1]. Our data shows that antibiotics are still prescribed by 65.8% of the physicians surveyed. Even more alarmingly, 13.6% of the participants used a combination of more than two antibiotics classes (Figure 3) for treatment of even mild ARS. Antibiotics overusage has been reported in some European countries [7,8], to have directly resulted in an increased prevalence of antimicrobial resistance in Europe [9,10]. Although such data is still unavailable in Asia, the global threat posed by resistant microorganisms has become an international health issue, product of careless antibiotics abuse.

In the literature, among more than 2000 studies on the antibiotic treatment of ARS published, only 49 involving 13,660 participants meet the Cochrane Board criteria for placebo control, statistical analysis, sufficient sample size and the description of clinical improvement or successful treatment [1,11]. In a recent Cochrane Review paper, the authors concluded that antibiotics have only a moderate effect in patients with uncomplicated ARS, in a primary care setting with symptoms for more than seven days. Since 80% of ARS patients treated without antibiotics improve within two weeks, clinicians need to weigh the moderate benefits of antibiotics against its potential for adverse consequences at both the individual and global level [11].

Surprisingly the study results showed that oral antihistamines are the most frequently prescribed drugs, especially for mild ARS. Antihistamines are standard treatment for IgE-mediated allergic diseases such as allergic rhinitis, where histamine (released by mast cells and basophils) is one of the major effectors of allergic reaction [12,13]. The pathophysiology of ARS is felt to be secondary bacterial infection due to the impairment of mechanical, humoral and cellular defenses and epithelial damage caused by viral infection (common cold) [1]. There is no indication for the use of antihistamines ARS treatments, except in co-existing allergic rhinitis.

In the EP^{3}OS document, intranasal corticosteroids are recommended for the treatment of ARS, both in the moderate (in monotherapy) and severe (with oral antibiotics) disease [14]. The introduction of topically administered glucocorticoids has improved the treatment of the upper (rhinitis, rhinosinusitis with and without nasal polyps) and lower (asthma) airway inflammatory disease. The clinical efficacy of glucocorticoids depends on their anti-inflammatory properties and ability to promote epithelial repair [1,15,16].

Most studies on corticosteroids in ARS have determined the effect of topical corticosteroids when used as adjunct therapy to antibiotics. Recently, a few studies were able to show a better efficacy of nasal corticosteroid when used as a monotherapy alone than antibiotics in the treatment of ARS [17-19]. However, further randomized clinical studies are needed to study the efficacy and appropriate use of antibiotics and nasal steroids as mono-or combined therapy in the treatment of ARS, with different severities.

In conclusion, this is the first study that demonstrates the high prevalence of ARS and its encounter by GPs, otolaryngologists and paediatricians in Asia. The diagnostic criteria in the EP^{3}OS document are well supported by Asian physicians. However, the actual management of ARS such as the unnecessary use of radiological investigations, over-usage of antibiotics and under-usage of nasal corticosteroids needs to be changed. Appropriate physicians education promoting better understanding of the nature of ARS and evidenced-based diagnostic and treatment options will improve treatment outcomes, and plays an important role in combating the emerging healthcare issue resulting from the rising global antimicrobial resistance.

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CONFLICT OF INTEREST

No conflicts of interest for all authors.

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ATTACHMENT

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SURVEY

Invitation to participate in the Survey on the "Management of Acute Rhinosinusitis in treatment Naïve Patients in Asia".

Dear Colleagues & Participants,

It is my utmost pleasure to invite you to participate in this survey on the Management of Acute Rhinosinusitis of "Treatment of Naïve Patients" in Asia.

Acute rhinosinusitis (ARS) is a significant health problem, being one of the top reasons for a visit to primary care clinics. Recently, an evidence-based guideline entitled "European Position Paper on Rhinosinusitis and Nasal polyps (**EP^{3}OS**) has been published to enhance the effectiveness and the quality of management of ARS patients.

As a member of the expert panelist, I wish to conduct a survey in general practitioners (GPs) / primary care physicians and other specialists who treat early stage of ARS in Asia, in order to better understand your concepts in the management of ARS. This will help in planning a regional dissemination of EP^{3}OS and clinical trials to promote the most effective treatment strategies leading to optimal outcomes for ARS patients.

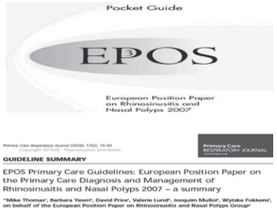
In appreciation to your participation, we will send you:

- The final report of this survey study.
- EP^{3}OS guidelines (either full document or the Pocket Guide).
- All educational materials for your patients as well as keep you updated in the future.

On behalf of the EP^{3}OS expert panel,

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Management of Acute Rhinosinusitis in treatment Naïve Patients in Asia.

*Name of Practitioner: _____

*Address of Practice: _____

*Email Address: _____

Date: _____

*Your participation in this survey is purely voluntary. Information provided above is optional and you may choose not to provide any contact details. However, if you do we will send you a final report at the end of survey. All your contact details collected will be kept strictly confidential.

A. Type of practice (choose one):

In:	Rural	or	Urban area (if applicable)
a. Group	☐		☐
b. Single practitioner	☐		☐
c. Polyclinic	☐		☐
d. ENT	☐		☐
e. Paediatrician	☐		☐
f. Others (specify please) _____	☐		☐

B. Years of practice (choose one):

☐ Less than 5 years
☐ 5 – 10 years
☐ More than 10 years

C. Your age (choose one):

☐ Less than 30 years
☐ 30 – 39 years
☐ 40 – 49 years
☐ 50 years or more

D. Your gender (choose one):

☐ Male
☐ Female

2. CONCEPT ON DIAGNOSTIC CRITERIA OF ACUTE RHINOSINUSITIS.

In EP^{3}OS, Acute Rhinosinusitis is defined as sudden onset of two or more symptoms (for less than 12 weeks) of nasal blockage/obstruction/congestion, discharge (anterior/posterior nasal drip), facial pain/pressure, and reduction/loss of smell. One of which should be either nasal blockage or discharge.

E. Do you agree with above diagnostic criteria of Acute Rhinosinusitis? (choose one)

☐ Yes (skip to question **G**)
☐ No

F. I do not agree with the above diagnostic criteria because (choose one)

☐ It will lead to over diagnosis of Acute Rhinosinusitis
☐ It will lead to under diagnosis of Acute Rhinosinusitis

Please indicate what you will consider to be the two key symptoms (you may refer to a list of common symptoms in the following question) for the diagnosis of Acute Rhinosinusitis:

_____

G. How often do the patients in your clinic with Acute Rhinosinusitis experience each of the following symptoms? (Check all that apply.)

a. Blockage/obstruction/congestion	☐often,	☐sometimes,	☐never
b. Discharge (anterior/posterior nasal drip)	☐often,	☐sometimes,	☐never
c. Facial pain/pressure	☐often,	☐sometimes,	☐never
d. Reduction/loss of smell	☐often,	☐sometimes,	☐never
e. Pharyngeal,laryngeal & tracheal irritation	☐often,	☐sometimes,	☐never
f. Sore throat	☐often,	☐sometimes,	☐never
g. Dysphonia	☐often,	☐sometimes,	☐never
h. Cough	☐often,	☐sometimes,	☐never
i. Drowsiness	☐often,	☐sometimes,	☐never
j. Malaise	☐often,	☐sometimes,	☐never
k. Fever	☐often,	☐sometimes,	☐never
l. Wheezing	☐often,	☐sometimes,	☐never
m. Others (please specify): _____	☐often,	☐sometimes,	☐never

H. Approximately what percentage of your total patients has had a diagnosis of Acute Rhinosinusitis over a 1 year period? (choose one)

☐ <2%
☐ 2-5%
☐ 6-10%
☐ 11-19%
☐ 20% or more

I. Usually Acute Rhinosinusitis patients visit your clinic when… (Circle all that apply.)

☐ Their symptoms have not subsided within 5 days
☐ Their symptoms have not subsided after more than 5 days
☐ They have a fever above 38°C
☐ They have severe facial pain
☐ They present with complications such as:

(orbital ☐; visual ☐; neurological complications ☐)(Check all that apply.)

J. Do you agree or disagree with the following statement?
For Acute Rhinosinusitis, it is recommended not to take radiologic investigations. (choose one)

☐ Agree

☐ Disagree, as I usually request:

Plain X-ray ☐, CT ☐, Echo ☐, or others ☐_____(specify please)

☐ Disagree, as I request CT scan only, in cases of patients with additional problems such as very severe, immuno-compromised patients with signs of complications.

3. TREATMENT OF ACUTE RHINOSINUSITIS.

In EP^{3}OS, severity of Acute Rhinosinusitis is divided based on:
(I) total severity visual analogue scale (VAS) score (0-10) or
(II) presence of severe signs and symptoms.

Not troublesome 0 ——— Visual analogue scale (VAS) score ——— 10 **Worst thinkable troublesome**

K. Please indicate which classification of Acute Rhinosinusitis you prefer to use (choose one)

1. Diagnosis based on VAS score ☐

- MILD symptoms: 0-3
- MODERATE symptoms: >3-7
- SEVERE symptoms: >7-10

2. Diagnosis based on severity of symptoms ☐

- MILD: Common cold
- MODERATE: No fever, no severe facial pain
- SEVERE: >38°C of fever, severe unilateral facial pain

These next questions ask about how you typically treat your patients with Acute Rhinosinusitis.

L. In general, do you treat Acute Rhinosinusitis patients with symptoms less than 5 days? YES ☐ NO ☐

If YES, then what is your typical treatment plan? (Check all that apply.)

If you answer "yes", please rank order each treatment from 1=most often to 10=least often

	Yes ☒	Numbering (1-10)
a. No treatment	☐	☐
b. Pain killers	☐	☐
c. Antibiotics	☐	☐

(penicillin / amoxicillin-clavulanate / broad spectrum antibiotics.)
Please specify the name, dosage and duration of antibiotics you have commonly used:_____

	Yes ☒	Numbering (1-10)
d. Topical antibiotics	☐	☐
e. Systemic steroids	☐	☐
f. Nasal steroids	☐	☐
g. Oral antihistamine	☐	☐
h. Decongestants	☐	☐
i. Nasal douche (washes)	☐	☐
j. Mucolytics	☐	☐
k. Herbal medicine	☐	☐
l. Others (specify) _____	☐	☐

M. What is your typical treatment plan for patients with MODERATE symptoms (defined by Question K) whose symptoms are persisting or increasing after 5 days? (Check all that apply.)
Please rank order of the treatment from 1 = most often to 10 = least often

	Yes ☒	Numbering (1-10)
a. No treatment	☐	☐
b. Pain killers	☐	☐
c. Antibiotics	☐	☐

(penicillin / amoxicillin-clavulanate / broad spectrum antibiotics.)

Please specify the name, dosage and duration of antibiotics you have commonly used:_____

	Yes ☒	Numbering (1-10)
d. Topical antibiotics	☐	☐
e. Systemic steroids	☐	☐
f. Nasal steroids	☐	☐
g. Oral antihistamine	☐	☐
h. Decongestants	☐	☐
i. Nasal douche (washes)	☐	☐
j. Mucolytics	☐	☐
k. Herbal medicine	☐	☐
l. Others (specify)_____	☐	☐

N. What is your typical treatment plan for patients with SEVERE symptoms (with fever >38°C or severe pain)? (Check all that apply.)
Please rank order of the treatment from 1 = most often to 10 = least often

	Yes ☒	Numbering (1-10)
a. No treatment	☐	☐
b. Pain killers	☐	☐
c. Antibiotics:	☐	☐

(penicillin / amoxicillin-clavulanate / broad spectrum antibiotics.)
Please specify the name, dosage and duration of antibiotics you have commonly used:_____

d. Topical antibiotics	☐	☐
e. Systemic steroids	☐	☐
f. Nasal steroids	☐	☐
g. Oral antihistamine	☐	☐
h. Decongestants	☐	☐
i. Nasal douche (washes)	☐	☐
j. Mucolytics	☐	☐
k. Herbal medicine	☐	☐
l. Others (specify)_____	☐	☐

O. What criteria do you typically use for referring each of the following types of Acute Rhinosinusitis patients to an ENT specialist?
(This question is NOT APPLICABLE for ENT specialist)

a. Patients with moderate symptoms **(choose one)**
- ☐ Always refer them to a specialist right after diagnosis
- ☐ When no improvement occurs after 14 days of treatment
- ☐ After one course of antibiotic treatment which did not work
- ☐ After 48 hours with no effect of intranasal corticosteroids ± antibiotics
- ☐ Never refer them to a specialist

b. Patients with severe symptoms (fever, pain) **(choose one)**
- ☐ Always refer them to a specialist right after diagnosis
- ☐ When no improvement occurs after 14 days of treatment
- ☐ After one course of antibiotic treatment which did not work
- ☐ After 48 hours with no effect of intranasal corticosteroids ± antibiotics
- ☐ Never

c. Patients with ocular or neurological complications **(choose one)**
- ☐ Always refer them to a specialist right after diagnosis
- ☐ When no improvement after 14 days of treatment
- ☐ After one course of antibiotic treatment which did not work
- ☐ After 48 hours with no effect of intranasal corticosteroids ± antibiotics
- ☐ Never

P. What criteria do you typically use for hospitalizing each of the following types of Acute Rhinosinusitis patients?

a. Patients with moderate symptoms or disease
- ☐ Always
- ☐ When no improvement after 14 days of treatment
- ☐ After one course of antibiotic treatment which did not work
- ☐ After 48 hours with no effect of intranasal corticosteroids ± antibiotics
- ☐ Never

b. Patients with severe symptoms or disease (fever, pain)
- ☐ Always
- ☐ When no improvement after 14 days of treatment
- ☐ After one course of antibiotic treatment which did not work
- ☐ After 48 hours with no effect of intranasal corticosteroids ± antibiotics
- ☐ Never

c. Patients with ocular or neurological complications
- ☐ Always
- ☐ When no improvement after 14 days of treatment
- ☐ After one course of antibiotic treatment which did not work
- ☐ After 48 hours with no effect of intranasal corticosteroids ± antibiotics
- ☐ Never