

The Management of Patients with Rhinosinusitis in Family Medicine in Slovenia

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Abstract—Background. Rhinosinusitis is among the most common infections treated in family practice. In Slovenia, a comprehensive management of rhinosinusitis at the primary level has not yet been researched, which results in the lack of data regarding guideline adherence. Our aim was to describe the management of patients with rhinosinusitis in family practices.

Methods. The study was conducted as a cross-sectional research with clinical vignette on managing a patient with rhinosinusitis and questions about characteristics of family physicians (FPs) and their practices, in a form of an online questionnaire. 892 specialists and FPs without specialty, and 320 residents of family medicine were contacted.

Results. The response rate was 475/1212 (39.2%). Preliminary diagnosis rhinosinusitis was provided by 96.2% of FPs. When managing patients with rhinosinusitis, 30.1% of FPs performed a complete blood count with differential, 50.9% CRP, 5.5% sinus X-ray, 61.1% prescribed nasal irrigation with saline, 31.6% nasal decongestants, 44.2% nasal corticosteroids, 24.4% did not prescribe antibiotics, 61.1% prescribed amoxicillin and 10.5% amoxicillin with clavulanic acid.

Conclusions. The research indicated many differences in managing a patient with rhinosinusitis. We speculate that at least part of a reason for indicated differences is due to divergences among guidelines.

Index Terms—case management; evidence-based practice; family practice; guideline adherence; sinusitis.

I. INTRODUCTION

Clinical guidelines can be defined as systematically developed views which help family physicians (FPs) and patients select proper medical care in specific clinical circumstances [1,2]. Several studies show that in family practices clinical guidelines are relatively poorly adhered to [3-8]. The studies also show the differences and discrepancies when dealing with rhinosinusitis [9-12]. Since studies mostly focus on certain aspects of the management (e.g. antibiotic treatment), a comprehensive management is rarely presented. In Slovenia, a comprehensive management of rhinosinusitis on a primary level has not yet been researched on an adequate sample of FPs in family practices, which results in lack of data regarding guideline adherence.

The aim of this study was to assess a comprehensive management of a patient with rhinosinusitis in family practice, to detect possible differences in the management and to what extent does it adhere to the guidelines.

II. MATERIAL AND METHODS

Study design and settings

The study was designed as a cross-sectional research with clinical vignette in the form of an online questionnaire, including family practices across Slovenia. For the online questionnaire, IKA service by Centre for Social Informatics at Faculty of Social Sciences, University of Ljubljana, was used. Consent was obtained from the Medical Ethics Committee of University Medical Centre Maribor (UKC-MB-KME-33/17).

Data collection

The first part of the online questionnaire provided data regarding the characteristics of FPs and their practices. The second part included clinical vignette (Box 1) with the description of a patient case, followed by questions on how the respondent would manage the patient during the first visit. The questionnaire and clinical vignette were designed based on literature and guidelines.

Some questions were open-ended, others provided options respondents could choose from, as well as add an additional answer. We were interested in their preliminary diagnosis, medical tests performed, referral to specialists, non-pharmacological treatment, pharmacological treatment, the duration of the sick leave and the intended checkup. The questionnaire was tested beforehand on five FPs.

Participants

The aim was to include all FPs working in family practices (family medicine specialists, general medicine specialists, family practice residents, and physicians without specialty). To that end, FPs (except residents) with the *List of active physicians in general medical practices, child and school dispensaries* from February 28, 2017 and published on April 12, 2017 on Health Insurance Institute of Slovenia's web page were contacted. From it, only FPs who work in the above-mentioned specialized practices were considered. Then, individual FPs' freely accessible online contact information

was found. Firstly, they were contacted via telephone and when they've agreed to participate, an e-mail with the link to the questionnaire was sent to them. One week later, they received a reminder. On the other hand, residents were contacted incidentally by calling the specialists' practices, others via Young doctors' and The Medical Chamber of Slovenia's e-mail databases. Residents received two e-mails via each of the lists with an invitation for cooperation.

There were 892 specialists and FPs without specialty contacted; 642 directly agreed to participate, 104 did not respond or they replied that they have yet to decide, and 131 declined to cooperate. Residents, who were contacted directly (12 residents), all accepted the invitation for cooperation. All others agreed to cooperate after they'd received an e-mail through Young doctors or The Medical Chamber of Slovenia's databases.

Clinical vignette

A 32-year-old saleswoman comes to the clinic because she had a cold for four days. She cites a stuffy nose, purulent discharge from the nose, cough, fever (38°C) and general malaise. Headache occurred in the facial area and the sense of smell worsened. The headache is aggravated by tilting the head forward.

The patient is unaffected, eupnoic at rest, blood pressure is 128/74 mmHg. Reddened nose mucosa, obstructed nose with purulent discharge is visible. The pharyngeal mucosa is also slightly reddened. The cervical lymph nodes are not tactilely enlarged or tender. On auscultation of the lungs audible normal breathing without pathological phenomena is heard. The patient relieved her symptoms with Lekadol®, which partially helped. The patient has no chronic diseases, allergies and does not receive any regular therapy.

Box 1. Clinical vignette

III. RESULTS

Characteristics of FPs

A total of 475 FPs filled out the questionnaire. The response rate for specialists and FPs without specialty was 423/892 (47.4 %) and for residents 52/320 (16.3%), in total 475/1212 (39.2 %). The analysis did not show statistically relevant differences regarding age (p=0.152), gender (p=0.994), regional distribution (p=0.286) and status (p=0.091) between the population of all active FPs in family practices and the subgroup of FPs in this study.

The average age of participants was 45.5 years (SD 11.1; with a range between 26 and 74 years) and 120 (25.3 %) were male.

Regarding specialty, there were 267 (56.2%) family medicine specialists, 134 (28.2 %) general medicine specialists, 52 (10.9 %) family medicine residents and 22 (4.6 %) physicians without specialty. A total of 336 (70.7 %) worked in a public institution, 113 (23.8 %) were concessionaires and 26 (5.5 %) were employed by a concessionaire.

Average number of patients in the practice was 1,862.9 (SD 545.9; with a range between 0–3400). In regard to total amount

of work (in practice plus overtime), 47.6 % of FPs worked over 42 hours weekly. On average, they treated 49.7 patients daily (SD 12.8; with a range from 2–100), while 122 (25.7 %) FPs treated ≥ 60 patients daily.

Patient management

Preliminary diagnosis rhinosinusitis was provided by 457 (96.2 %) FPs. The stipulated diagnostics, referrals and non-pharmacological treatment are shown in Table 1.

TABLE I. Stipulated diagnostics, referrals and non-pharmacological treatment of a patient with rhinosinusitis by 475 FPs that work in family practices in Slovenia (2017-2018)

Diagnostic tests	Referral to a clinical specialist	Non-pharmacological treatment
No tests (222; 46.7 %)	No referral (471; 99.2 %)	No advice (34; 7.2 %)
CRP (242; 50.9 %)	Otorhinolaryngo logist (4; 0.8 %)	Nasal irrigation with saline (290; 61.1 %)
Complete blood count with differential (143; 30.1 %)		Hydration (210; 44.2 %)
Complete blood count (94; 19.8 %)		Rest (188; 39.6 %)
Head / paranasal sinuses X-ray (26; 5.5 %)		Inhalations of water vapor or etheric oils (92; 19.4 %)
Erythrocyte sedimentation (ESR) (13; 2.7 %)		Unidentified cleaning of the nose (39; 8.2 %)
		Other (24; 5.1 %)
		Sinuses heating (18; 3.8 %)

One medication was prescribed by 82 (17.3 %) FPs, 218 (45.9 %) prescribed two, 142 (29.9 %) three, 22 (4.6 %) four and 11 (2.3%) no medication. Most often prescribed were amoxicillin and paracetamol (Table 2).

Out of all FPs who prescribed antibiotic treatment (357; 75.5 %), 122 (34.2 %) instructed the patient to take it for 5-7 days, 235 (65.8 %) prescribed it for more than 7 days. Among FPs that prescribed nasal decongestants (150, 31.6 %), 63 (42 %) FPs prescribed them for a period of 1–5 days, 29 (19.3 %) for a period of 6–10 days and 58 (38.7 %) did not specify the duration of treatment. Out of all FPs who prescribed nasal corticosteroids (210; 44.2 %), 84 (40 %) physicians prescribed it for 1–7 days, 100 (47.6 %) for 8–14 days, 16 (7.6 %) for more than 14 days and 10 (4.8 %) gave other instructions.

TABLE II. Medications that were prescribed by 475 FPs working in family practices in Slovenia for the treatment of the patient with rhinosinusitis (2017-2018)

A group of prescribed medications (number and % of FPs)	Generic name (number and % of FPs)
Antibiotic (359; 75.6 %)	Amoxicillin (290; 61,1 %) Amoxicillin with clavulanic acid (50; 10.5 %) Ampicillin (10; 2.1 %) Azithromycin (4; 0.8 %) Penicillin (3; 0.6 %) Clindamycin (2; 0.4 %)
Anti-pyretic/analgesic (259; 54.3 %)	Paracetamol (175; 36.9 %) Naproxen (46; 9.6 %) Ibuprofen (23; 4.8 %) Unidentified anti-pyretic (7; 1.4 %) Metamizole (5; 1.0 %) Diclofenac (2; 0.4 %) Tramadol (1; 0.2 %)
Nasal glucocorticoids (210; 44.2 %)	Mometasone, fluticasone, budesonide
Nasal decongestants (150; 31.6 %)	Oxymetazoline, xylometazoline, naphazoline
Antihistamines (5; 1.1 %)	Levocetirizine, loratidine
BNO 1016 (51; 10.7 %)	
Other (5; 1.0 %)	

The majority of FPs would have prescribed 7-10 days of sick leave and a checkup after 4-7 days (Table III).

TABLE III. Stipulated duration of the sick leave and checkup prescribed by 475 FPs that work in family practices in Slovenia (2017-2018)

Duration of the sick leave		Checkup after	
None	3 (0.6 %)	None	42 (8.8 %)
<7 days	187 (39.4 %)	1-3 days	129 (27.2 %)
7-10 days	248 (52.2 %)	4-7 days	247 (52.0 %)
>11 days	30 (6.3 %)	>7 days	17 (3.6 %)
Other conditions	7 (1.5 %)	Other conditions	40 (8.4 %)

IV. DISCUSSION

Our study showed numerous differences in the management of presented case of acute rhinosinusitis. It was estimated that in the majority of cases this would have no negative consequences for the patient, but it may result in a non-optimal management in terms of excessive tests, improper prescription of antibiotics and non-pharmacological treatment, duration of sick leave and checkups. It can be speculated that at least part of a reason for indicated differences is due to divergences among guidelines.

As there are no Slovenian guidelines for the management of acute viral rhinosinusitis, we mostly followed European and American guidelines [13-15].

One of the biggest challenges in the management of a case of rhinosinusitis is differentiation between viral and bacterial rhinosinusitis, consequently physicians are prescribing antibiotic therapy too often [16,17]. However, guidelines differ both in criteria for bacterial sinusitis and indications for antibiotic therapy [13-15].

46.7 % of physicians have decided not to perform any investigations in the diagnostic procedure, which is in line with guidelines [13-15].

Imaging and microbiological investigations are not required for the clinical diagnosis of acute rhinosinusitis, but are indicated in patients with suspected rhinosinusitis with complications [13-15]. Also imaging investigations cannot distinguish between viral and bacterial sinusitis [15]. According to that, only few FPs indicated these diagnostic tests. However, laboratory tests, which may only be indicated when bacterial superinfection is suspected [14], were done much more often. CRP was used most often, probably with ambition of FPs to distinguish between viral and bacterial sinusitis and to prescribe antibiotics only in the case of elevated CRP [14,18]. Data from other European countries show similar share of physicians basing their decision only on anamnesis and clinical examination [9], but also more of them performed x-rays [10].

Less than one percent of FPs referred patient to clinical specialist, which is unnecessary in the case of uncomplicated disease in otherwise healthy patient [15,19].

Acute rhinosinusitis is much more commonly of viral etiology and self-limiting disease, so symptomatic therapy is advised to improve nasal patency, relieve pain, and systemic signs such as fever and fatigue [13,14,17,19]. In the guidelines and literature, nasal irrigation with saline is most often mentioned among non-pharmacological treatment [13,14,19], which could explain the fact that more than half of FPs advised it. Yet, its effects are explained as limited [13,14] with no serious side effects [20]. Similarly, inhalations of water vapour were also advised, even though they have no described benefit, beside subjective feeling of symptom reduction [14,21-23]. We believe that further research in this area would be needed, as there is insufficient data on the usefulness of certain forms of non-pharmacological therapy. Part of FPs (7.2 %) gave no advice, which could be interpreted as insufficient treatment.

Guidelines also recommend analgesics/anti-pyretics, nasal decongestants and, in moderate form, nasal corticosteroids [13,14]. Almost all FPs choose at least one of those medications. Maximum duration of therapy with nasal decongestants is 3-5 days, due to the risk of recurrent nasal congestion and drug-induced rhinitis [13,24], but more than half of FPs prescribed them for more than 5 days or did not specified the duration.

We observed a lot of variation among the duration of treatment with nasal corticosteroids, which could be due to the fact that duration is also undefined in the guidelines [13,14].

Despite some promising research [25], guidelines state that there is not enough evidence for effectiveness of herbal

preparation BNO 1016 (in Slovenia registered as Sinupret) [14], which was prescribed by one tenth of FPs. Antihistamines and mucolytics are not recommended due to the lack of data on effectiveness [13-15] and almost none of the included FPs prescribed them. Our data is similar to foreign studies, it differs only in prescription patterns for expectorants, mucolytics and antihistamines, which are rarely prescribed in Slovenia [11,12].

Despite the fact that less than 2% of acute rhinosinusitis are of bacterial etiology, evidence for spontaneous resolution and recommendations for prescribing antibiotic therapy only in the severe forms, more than 80% of acute rhinosinusitis patients in Europe and North America receive antibiotic treatment [26,27]. However, guidelines propose different definition for bacterial rhinosinusitis [13-15].

According to American Otolaryngology guidelines (AAO-HHNS) a physician should diagnose acute bacterial rhinosinusitis if the symptoms and signs of acute rhinosinusitis persist for at least 10 days without improvement (open waiting) or if the clinical picture of rhinosinusitis worsens within 10 days of initial improvement [13]. European guidelines criteria are persistence of symptoms for >7 days without improvement, worsening after 5-7 days (biphasic illness) or presence of at least 3 defined signs or symptoms: disturbed nasal discharge (predominantly from one nostril) and purulent secretions in the nasal cavity, severe local pain (unilateral), fever >38 °C, elevated SR or CRP or worsening of the condition after a mild onset of the disease. Main addition in European guidelines is adding severity of the symptoms and also shortening minimal duration of the illness [14]. American Infectious Diseases guidelines are similar to European in this regard [15].

Three quarters of FPs prescribed antibiotics, which is similar to foreign data [11,12,26,27]. If we consider that most of acute rhinosinusitis are viral, this may seem high, yet on the other hand many differences in guidelines regarding clinical criteria for bacterial rhinosinusitis may be the reason.

Slovenian recommendations [17,28] advise amoxicillin for 5-7 days and in case of failure amoxicillin with clavulanic acid or several other antibiotics. Our data is in line with this recommendation since almost all FPs that prescribed any of the antibiotics chose amoxicillin, but more than half of them prescribed it for more than 7 days, which is longer than advised duration in Slovenian recommendations. Foreign guidelines also mostly advise short duration of therapy [14,15], or duration up to 10 days [13].

All but three doctors prescribed sick leave, but there are no recommendations regarding duration of the sick leave in the guidelines [13-15]. Foreign data show different durations of sick leaves in European countries, for example physicians prescribe it more often and for longer time in Poland than in Norway. Our data is similar to that of Poland [29]. Similarly, almost all FPs ordered a checkup, which is very important if FP decides for open waiting, but we found no guidance on which day to perform a checkup [13-15].

Most noticeable differences between observed management of rhinosinusitis and the guidelines are order of a complete blood count with or without differential and differences in prescription patterns for antibiotics. We estimate that ordering

a complete blood count with or without differential does not have a considerable negative impact on the quality of patient management, but it still increases the expenses. On the other hand, criteria for recognizing possible bacterial rhinosinusitis and antibiotic prescription should be more consistent. We observed many differences among guidelines, which could be an important factor for why, according to our and foreign data, [11,12,27] physicians still treat rhinosinusitis as a bacterial infection.

The response rate was relatively high, 475/1212 (39.2%), and was lowered by poorer response from residents (16.3%) invited to participate mainly via the list of e-mail addresses. According to the data from the Medical Chamber of Slovenia, our study included 35.3% of all FPs working in family practices in Slovenia in 2017/2018, and as many as 44% of all FPs, excluding residents. The sample of FPs in this study is bigger than in similar studies done in Slovenia before (12,13), and the inclusion of residents presents an additional advantage.

The main advantages of this study are the many parameters considered in the management of rhinosinusitis in family practices. Factors that are otherwise rarely a subject of studies (referrals, non-pharmacological treatment, duration of pharmacological treatment, checkup and sick leave) were included. By using a clinical vignette, all FPs were treating the same patient, allowing us to present differences among individual FPs. A weak point of the research is a low response rate from the residents (16.3 %) which decreases the relevance of the data for this group.

The established great variability in the patient management indicates a need for Slovenian guidelines. Possible solutions for more uniform treatment may also be in practice-oriented education, expert meetings and specially customized guidelines for family practice. Data from this study can be the basis for further research regarding other factors that influence FP's decisions, reasons for FPs' failure to follow guidelines, and for developing customised guidelines for family practices.

REFERENCES

1. Drinovec J. Are evidence-based medicine with clinical practice guidelines restrictive for physicians? *Zdrav Vestn.* 2006;75(75):653-7.
2. Fischer F, Lange K, Klose K, et al. Barriers and strategies in guideline implementation—a scoping review. *Healthcare (Basel).* 2016;4(3):36.
3. Heneghan C, Perera R, Mant D, et al. Hypertension guideline recommendations in general practice: awareness, agreement, adoption, and adherence. *Br J Gen Pract.* 2007;57(545):948-52.
4. Pepió Vilaubí JM, Orozco-Beltrán D, Gonçalves AQ, et al. Adherence to European clinical practice guidelines for secondary prevention of cardiovascular disease: A cohort study. *Int J Environ Res Public Health.* 2018;15(6):1233.
5. Car J, Švab I, Kersnik J, et al. Management of lower urinary tract infection in women by Slovene GPs. *Fam Pract.* 2003;20(4):452-6.

6. Car J, Kersnik J, Švab I, et al. Detection and management of depression in Slovene family practice. A case vignette study. *Zdr Varst.* 2006;45(45):90-6.
7. Klemenc-Ketiš Z, Švab I, Poplas Susič A. Implementing quality indicators for diabetes and hypertension in family medicine in Slovenia. *Zdr Varst.* 2017;56(4):211-9.
8. Murphy M, Bradley CP, Byrne S. Antibiotic prescribing in primary care, adherence to guidelines and unnecessary prescribing—an Irish perspective. *BMC Fam Pract.* 2012;13(1):43.
9. Varonen H, Rautakorpi UM, Huikko S, et al. Management of acute maxillary sinusitis in Finnish primary care. Results from the nationwide MIKSTRA study. *Scand J Prim Health Care.* 2004;22(2):122-7.
10. Jaume F, Quinto L, Alobid I, et al. Overuse of diagnostic tools and medications in acute rhinosinusitis in Spain: a population-based study (the PROSINUS study). *BMJ Open.* 2018;8(1):e018788.f.
11. Klossek JM, Mesbah K. Presentation and treatment of acute maxillary sinusitis in general practice: a French observational study. *Rhinology.* 2011;49(1):84-9.
12. Pulkki J, Rautakorpi UM, Huikko S, et al. Recommended and prescribed symptomatic treatment for acute maxillary sinusitis in Finnish primary care. *Rhinology.* 2007;45(3):197-201.
13. Rosenfeld RM, Piccirillo JF, Chandrasekhar SS, et al. Clinical practice guideline (update): adult sinusitis. *Otolaryngology Head and Neck Surgery* 2015; 152(2 Suppl):S1-S39.
14. Fokkens WJ, Lund VJ, Mullol J, et al. European Position Paper on Rhinosinusitis and Nasal Polyps 2012. *Rhinol Suppl.* 2012;23:1-298.
15. Chow AW, Benninger MS, Brook I, et al. IDSA Clinical practice guideline for acute bacterial rhinosinusitis in children and adults. *Clin Infect Dis.* 2012;54(8):e72-e112.
16. Patel ZM, Hwang PH. Acute sinusitis and rhinosinusitis in adults: clinical manifestations and diagnosis. UpToDate [Internet]. 2020 Nov [cited 2020 Nov 20]. Available from: <https://www.uptodate.com/contents/acute-sinusitis-and-rhinosinusitis-in-adults-clinical-manifestations-and-diagnosis>.
17. Goriup N. Akutni rinosinuzitis v ambulantni družinske medicine. In: Drešček M, ed. XVII. Kokaljevi dnevi. Fitoterapija, kardiologija, pulmologija, angiologija, gastroenterologija, aktualne teme v družinski medicine, praktične veščine. Zbornik predavanj, 2006 Apr. Ljubljana: Zavod za razvoj družinske medicine; 2017. p. 29-32.
18. Llor C, Bjerrum L, Arranz J, et al. C-reactive protein testing in patients with acute rhinosinusitis leads to a reduction in antibiotic use. *Fam Pract.* 2012;29(6):653-8.
19. Patel ZM, Hwang PH. Uncomplicated acute sinusitis and rhinosinusitis in adults: Treatment. UpToDate [Internet]. 2020 Nov [cited 2020 Nov 20]. Available from: <https://www.uptodate.com/contents/uncomplicated-acute-sinusitis-and-rhinosinusitis-in-adults-treatment>.
20. Rabago D, Zgierska A. Saline nasal irrigation for upper respiratory conditions. *Am Fam Physician.* 2009;80(10):1117-9.
21. Singh M, Singh M, Jaiswal N, et al. Heated, humidified air for the common cold. *Cochrane Database Syst Rev.* 2017;8:CD001728.
22. National Institute for Health and Care Excellence (NICE). Sinusitis (acute): antimicrobial prescribing (NG79). [Internet] London, UK: NICE; 2017. [cited 2020 Nov 20] Available from: <https://www.nice.org.uk/guidance/ng79>.
23. Foden N, Burgess C, Shepherd K, et al. A guide to the management of acute rhinosinusitis in primary care management strategy based on best evidence and recent European guidelines. *Br J Gen Pract.* 2013 Nov;63(616):611-3.
24. Mortuaire G, de Gabory L, François M, et al. Rebound congestion and rhinitis medicamentosa: nasal decongestants in clinical practice. Critical review of the literature by a medical panel. *Eur Ann Otorhinolaryngol Head Neck Dis.* 2013;130(3):137-44.
25. Jund R, Mondigler M, Stammer H, et al. Herbal drug BNO 1016 is safe and effective in the treatment of acute viral rhinosinusitis. *Acta Otolaryngol.* 2015; 135(1):42-50.
26. Meltzer EO, Hamilos DL. Rhinosinusitis Diagnosis and Management for the Clinician: A Synopsis of Recent Consensus Guidelines. *Mayo Clin Proc.* 2011; 86(5): 427-443.
27. Fokkens WJ. Avoid prescribing antibiotics in acute rhinosinusitis. *BMJ* 2014;349:g5703.
28. Podboj J, Ihan Hren N, Čizman M, et al. Stopenjska obravnava bolnikov s sinuzitisom. In: Beovič B, Strle F, Čizman M, eds. Infektološki simpozij 2006. Zbornik predavanj; 2006 Mar; Ljubljana: Sekcija za kemoterapijo SZD; 2006. p.85-96.
29. Raheison C, Peray P, Poirier R, et al. Management of lower respiratory tract infections by French general practitioners: the AIR II study. *Analyse Infections Respiratoires. Eur Respir J.* 2002;19(2):314-9.