

The impact of rhinosinusitis in clinical practice: an Italian Survey

Desiderio Passali¹, Valerio Damiani², Giulio Cesare Passali³, Pasquale Cassano⁴, Marco Piemonte⁵, Giorgio Ciprandi⁶

¹ FOS Executive Board Member-University of Siena; ²DMG Medical Department, Pomezia (Rome), Italy; ³ ENT Department, University of Sacred Heart, Rome, Italy; ⁴ Italian Society of Rhinology (SIR); ⁵ ENT Department, Azienda Sanitaria Universitaria Integrata di Udine, Udine, Italy; ⁶ Allergy Clinic, Casa di Cura Villa Montallegro, Genoa, Italy

Abstract. Rhinosinusitis is a common disease that is classified in acute (ARS) and chronic (CRS). The current Survey was conducted on a sample of about 5,000 adult subjects in 5 Italian cities. A questionnaire, containing 15 questions, was administered on the road. RS affects about 20% of the general population. The most common diagnostic test was the skull x-ray. Antibiotics were the most frequently prescribed therapy. In conclusion, the current Survey demonstrated that RS is a common disorder in Italy, the diagnostic work-up is still incorrect, and the therapeutic approach does not adhere to the guidelines. Therefore, there is a need to implement adequate information on this topic in Italy. (www.actabiomedica.it)

Key words: Italy, Survey, rhinosinusitis, general population, questionnaire, on the road

Introduction

Sinusitis usually refers to inflammation localized in the nasal sinuses and, as it is usually associated with the inflammation of nasal mucosae, such as the rhinitis, the term rhinosinusitis (RS) is considered more correct (1). It has to be noted that RS may affect any age.

In clinical practice, RS should be suspected in the presence of nasal symptoms, including nasal congestion and rhinorrhea, persisting for more than 7-10 days without any improvement. Noteworthy, a chronological cut-off is useful to differentiate RS from the common cold that is usually self-limiting and usually resolves by 7-10 days (3-5). The symptoms of acute RS (ARS) tend to resolve within 3-4 weeks; however, if sinus inflammation persists (regardless of the medical management), it is evolving to chronic RS (CRS), defined by a duration longer than 8-12 weeks (1,2). Therefore, the diagnosis of RS often relies on the clinical ground, including the duration of nasal symptoms,

the characteristics of nasal discharge (purulent), and other symptoms, such as facial pain and fever. Computerized tomography (CT) may be required whenever the suspicion of extra-sinus complications should arise (6-9). Moreover, CT is useful to detect nasal polyps in CRS patients.

According to the endoscopic and/or radiological findings, there are two main phenotypes: CRS with nasal polyposis (CRSwNP) and CRS without nasal polyposis (CRSsNP).

From an epidemiological point of view, there is evidence that CRS is frequently associated with asthma, and is a frequent comorbidity in patients with immunodeficiency, cystic fibrosis, and aspirin intolerance (9-11). In particular, RS frequently triggers and/or worsens asthma (12,13).

Matsuno and colleagues reported a 36.7% prevalence of RS in asthmatic patients. Notably, sinus CT abnormalities were detected in 66.3% of patients, more frequently in moderate to severe asthma. Another study confirmed that RS was more frequent in severe

and steroid-dependent asthma (14-18). Consistently, RS is more frequent in patients with poorly controlled asthma (19). Also, RS is frequent in patients with hospital admission for asthma exacerbation (20). Further, it has been reported that about 50% of children diagnosed with persistent asthma presented concomitant RS diagnosed by nasal endoscopy (21). Therefore, according to the concept of the so-called United Airways Disease, RS should be ever suspected in asthmatic patients (22).

On the other hand, precise data about prevalence, clinical features, and pragmatic management are lacking. Therefore, an Italian Survey has been performed aiming to describe these characteristics in clinical practice.

Methods

The current Survey was performed using a questionnaire administered to subjects in 5 Italian cities: Ferrara, Viterbo, Reggio Calabria, Trapani, and Cagliari. The choice of these cities was made to guarantee a homogeneous distribution among the North, Centre, South Italy and the two major islands.

The interviewees were adults of both genders, randomly enrolled (the interview was performed on the road).

The questionnaire included 15 queries, reported in detail in Table 1.

The analysis of the data was descriptive.

Table 1. Questionnaire

Questions	Possible answers
1 Do you think of suffering from rhinosinusitis?	a) Yes b) No c) I do not know
2 How do you define your rhinosinusitis?	a) Acute b) Recurrent c) Chronic d) I do not know
3 In which season are the symptoms more severe?	a) Spring b) Summer c) Autumn d) Winter e) Always
4 At what age did your illness begin?	a) <10 years b) 10-20 years c) 21-30 years d) 31-40 years e) 41-50 years f) >50 years
5 What are your symptoms?	a) Nasal obstruction b) Rhinorrhea c) Facial pain d) Sneezing e) Nasal itching f) Headache g) Dysosmia h) Heavy head i) Fever

(continued on next page)

Table 1 (continued). Questionnaire

Questions	Possible answers
6 Who did the diagnosis perform?	a) General practitioner b) Otorhinolaryngologist c) Allergist d) Homoeopathy doctor e) Pharmacist
7 Have you ever performed tests to confirm the diagnosis?	a) Yes b) No c) I do not know
8 If yes, what?	a) Nasal endoscopy b) RX skull c) CT head d) Nasal function testing e) Allergy tests f) Nasal swab culture g) Nasal cytology
9 Do you do any therapy for your problem?	a) Yes, conventional medicine b) Yes, homoeopathy c) Yes, both d) No treatment
10 When do you use medicine?	a) During the acute phase b) Before the acute phase c) Before and during the acute phase d) During the whole year
11 Who did the therapy prescribe?	a) General practitioner b) Otorhinolaryngologist c) Allergist d) Homoeopathy doctor e) Pharmacist
12 What kind of drugs do you use?	a) Antibiotics b) Antihistamines c) Systemic corticosteroids d) Intranasal corticosteroids e) Nasal decongestants f) Nasal irrigation
13 Do you remember the name of the antibiotic?	
14 Who did homoeopathy suggest?	a) General practitioner b) Otorhinolaryngologist c) Allergist d) Homoeopathy doctor e) Pharmacist f) Other (friends)

Results

Globally, 4999 subjects (2923 males and 2076 females; mean age 35 years) participated in the Survey, equally distributed along Italy.

The results are reported in Table 2 and Figures.

The 20% of the sample think to have rhinosinusitis (Figure 1A); 7% suffered from acute RS, 28% from recurrent, and 48% from CRS. Winter and the whole year are the most frequent periods (Figure 1B).

Table 2. Answers

Questions	Possible answers	
1 Do you think of suffering from rhinosinusitis?	Yes	20%
	No	53%
	I do not know	27%
2 How do you define your rhinosinusitis?	Acute	7%
	Recurrent	28%
	Chronic	48%
	I do not know	17%
3 In which season are the symptoms more severe?	Spring	16%
	Summer	4%
	Autumn	11%
	Winter	39%
	Always	30%
4 At what age did your illness begin?	<10 years	3%
	10-20 years	12%
	21-30 years	38%
	31-40 years	30%
	41-50 years	12%
	>50 years	5%
5 What are your symptoms?	Nasal obstruction	72%
	Rhinorrhea	38%
	Facial pain	83%
	Sneezing	5%
	Nasal itching	5%
	Headache	77%
	Dysosmia	18%
	Heavy head	91%
	Fever	81%
6 Who did the diagnosis perform?	General practitioner	33%
	Otorhinolaryngologist	42%
	Allergist	14%
	Homoeopathy doctor	0
	Pharmacist	11%
7 Have you ever performed tests to confirm the diagnosis?	Yes	21
	No	71%
	I do not know	8%
8 If yes, what?	Nasal endoscopy	35%
	RX skull	62%
	CT head	13%
	Nasal function testing	3%
	Allergy tests	2%
	Nasal swab culture	2%
	Nasal cytology	0
9 Do you do any therapy for your problem?	Yes, conventional medicine	74%
	Yes, homoeopathy	4%
	Yes, both	4%
	No treatment	18%

(continued on next page)

Table 2 (continued). Answers

Questions	Possible answers	
10 When do you use medicine?	During the acute phase	83%
	Before the acute phase	6%
	Before and during the acute phase	7%
	During the whole year	4%
11 Who did the therapy prescribe?	General practitioner	22%
	Otorhinolaryngologist	59%
	Allergist	12%
	Homoeopathy doctor	2%
	Pharmacist	5%
12 What kind of drugs do you use?	Antibiotics	63%
	Antihistamines	8%
	Systemic corticosteroids	19%
	Intranasal corticosteroids	20%
	Nasal decongestants	15%
	Nasal irrigation	0
13 Do you remember the name of the antibiotic?	No	100%
14 Who did homoeopathy suggest?	General practitioner	0
	Otorhinolaryngologist	0
	Allergist	0
	Homoeopathy doctor	77%
	Pharmacist	0
	Other (friends)	23%
15 Do you remember the name of the homoeopathic product?	No	100%

Most patients had the onset of RS between 21 and 40 years (68%), as reported in Figure 1C.

The most common symptoms are the heavy head (91%), facial pain (83%), fever (81%), headache (77%), nasal obstruction (72%), and rhinorrhea (68%), as reported in Figure 1D. The diagnosis was made most frequently by the ORL specialist (42%), the GP (33%), the allergist (14%), and the pharmacist (11%). Twenty-one % performed a test to confirm the diagnosis. The most common tests were: RX skull (62%), nasal endoscopy (62%), and CT head (13%), as reported in Figure 2A.

Seventy-four % took conventional therapy, 4% homoeopathy, and 4% both; 18% did not take any medicine. Most patients used medicines during the acute phase (83%). The kind of medicine is reported in Figure 2B: antibiotics were used in 63% of subjects and corticosteroids in about 20%.

Homoeopathy was prescribed exclusively by the homoeopathy doctor or suggested by friends.

Discussion

Rhinosinusitis is a common disease that is classified in acute (ARS) and chronic (CRS). ARS follows usually acute upper respiratory infections, the mainly common cold. However, epidemiological data are very few about Italy.

CRS is a chronic inflammation of the sinus. From an epidemiological point of view, it is estimated that CRS affects 5%-12% of the general population worldwide (23-26). The European Position Paper on Rhinosinusitis and Nasal Polyps (EPOS) proposed a statement about CRS diagnosis that is clinically based on symptoms supported by signs of mucosal inflammation found on imaging or with nasal endoscopy (27). It has been recently reported that the prevalence of clinically based CRS ranged between 3% and 6.4% (28,29). CRS is classically divided into a phenotype with and without nasal polyps. Using patient questionnaires to measure the prevalence of CRSwNP yielded estimates

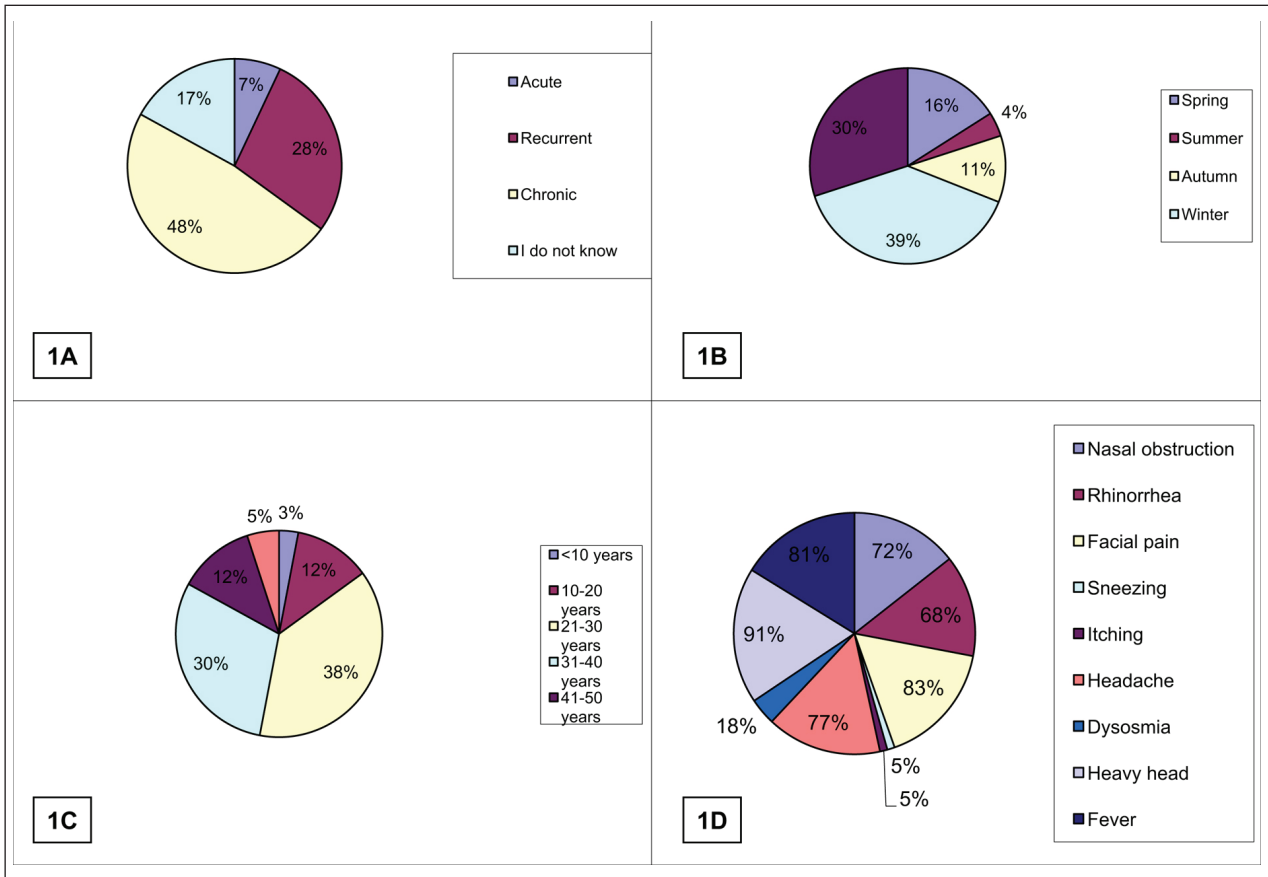


Figure 1. A = Distribution of the classification of Rhinosinusitis; B = Distribution of the seasons when RS occurred; C = Distribution of the age at the onset of RS; D = Distribution of the most common symptoms of RS

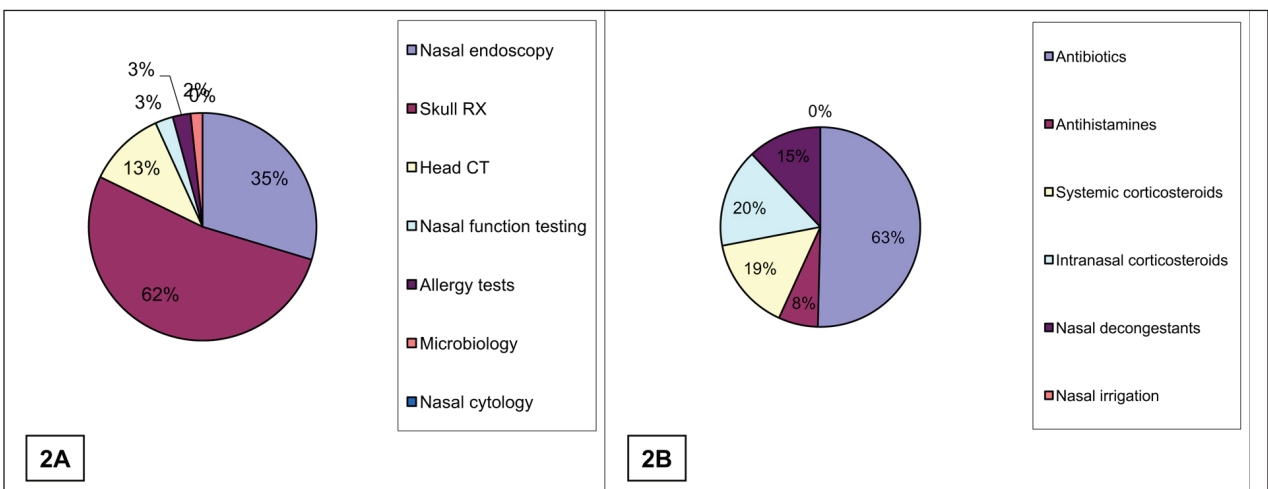


Figure 2. A = The most common test used to confirm the RS diagnosis; B = The most common medicines used to treat RS

of 2.1% (France) to 4.3% (Finland) in Europe and 1.1% in China (30). CRSwNP comprises a heterogeneous group of patients who differ for coexisting asthma, allergy, NSAID-exacerbated respiratory disease (N-ERD), smoking, age of onset, and disease severity (31-34). Asthma affects 30%-70% of the CRSwNP patients (35,36). Conversely, the presence of nasal polyps is associated with the severity of asthma, regardless of smoking status ranging from 10%-30% in mild asthma to 70%-90% in severe asthma (37,38).

Based on this background, the current Survey was conducted in 5 Italian cities enrolling about 5,000 adult subjects. The results are interesting as it was conducted on the general population, so the outcomes can mirror the situation that may occur in clinical practice.

Firstly, the rough prevalence is about 20%, including both ARS and CRS. The winter is the most common season for RS occurrence.

The distribution of the frequency of symptoms and signs is consistent with the clinical diagnostic criteria proposed by the EPOS. However, the most interesting data concerned the pragmatic approach performed by physicians. From a diagnostic point of view, the diagnosis is made primarily by ORL specialists. However, a skull x-ray is the most requested diagnostic test. This result is impressive and underlines the lack of updated knowledge about diagnostic criteria by Italian doctors.

From a therapeutic point of view, antibiotics are the main pharmacological class prescribed for RS, probably for ARS. Corticosteroids, both topical and systemic, are relatively underused: also, in this case, it could depend on the ignorance of the guidelines.

Globally, the scenario that appears from this Survey is rather unsatisfying and highlights the need for adequate information for the medical class.

The current Survey has some limitations, including the cross-sectional design, the lack of a methodologically correct definition of the questions, and the answers based only on patients' impressions. On the other hand, the strength of this study is based on the high number of participants and the conduction on the general population.

In conclusion, the current Survey demonstrated that RS is a common disorder in Italy, the diagnostic work-up is still incorrect, and the therapeutic approach does not adhere to the guidelines. Therefore,

there is a need to implement adequate information on this topic in Italy.

Conflict of interest: all the authors, but DV employee of DMG, have no conflict of interest about this matter.

References

1. R. Tan, S. Spector, Pediatric sinusitis. *Curr. Allergy Asthma Rep* 2007;7:21-426
2. A. Magit, Pediatric rhinosinusitis. *Otolaryngol Clin* 2014;47:733-746
3. E.R. Wald, K.E. Applegate, C. Bordley, et al. American Academy of Pediatrics. Clinical practice guidelines for the diagnosis and management of acute bacterial sinusitis in children aged 1 to 18 years. *Pediatrics* 2013;132:e262-e280
4. C. Cyr, R. Racette, C.P. Leduc, C. Blais, Do symptoms and initial clinical probability predict the radiological diagnosis of acute sinusitis in children? *Paediatr Child Health* 2001;6:536-539
5. D. Ueda, Y. Yoto, The ten-day mark as a practical diagnostic approach for acute paranasal sinusitis in children. *Pediatr Infect Dis J* 1996;15:576-579
6. N. Bhattacharyya, D.T. Jones, M. Hill, N.L. Shapiro, The diagnostic accuracy of computed tomography in pediatric chronic rhinosinusitis. *Arch Otolaryngol Head Neck Surg* 2004;130:1029-1032
7. H.H. Ramadan, Pediatric sinusitis: an update. *J Otolaryngol* 2005;34:S14-S17
8. J.S. Glickstein, R.K. Chandra, J.W. Thompson, Intracranial complications of pediatric sinusitis. *Otolaryngol Head Neck Surg* 2006;134:733-736
9. A.T. Peters, S. Spector, J. Hsu, et al. Joint task force on practice parameters, representing the American Academy of allergy, asthma and immunology, the American college of allergy, asthma and immunology, and the joint council of allergy, asthma and immunology. Diagnosis and management of rhinosinusitis: a practice parameter update. *Ann Allergy Asthma Immunol* 2014;113:347-385
10. R.G. Slavin, S.L. Spector, I.L. Bernstein, et al. The diagnosis and management of sinusitis: a practice parameter update. *J Allergy Clin Immunol* 2005;116:S13-S47
11. W.J. Fokkens, V.J. Lund, J. Mullol, et al. EPOS 2012: European position paper on rhinosinusitis and nasal polyps 2012. A summary for otorhinolaryngologists. *Rhinology* 2012;50:1-12
12. R.G. Slavin, Asthma and sinusitis. *J Allergy Clin Immunol* 1992;90:534-537
13. G.L. Marseglia, S. Caimmi, A. Marseglia, et al. Rhinosinusitis and asthma. *Int J Immunopathol Pharmacol* 2010;23:29-31
14. O. Matsuno, E. Ono, R. Takenaka, et al. Asthma and sinusitis: association and implication. *Int Arch Allergy Immunol* 2008;147:52-58

15. S.E. Crater, E.J. Peters, C.D. Phillips, T.A. Platts-Mills. Prospective analysis of CT of the sinuses in acute asthma. *Am J Roentgenol* 1999;173:127-131
16. A. ten Brinke, P.J. Sterk, A.A. Masclee, et al. Risk factors of frequent exacerbations in difficult-to-treat asthma. *Eur Respir J* 2005;26:812-818
17. M. Bresciani, L. Paradis, A. Des Roches, et al. Rhinosinusitis in severe asthma *J Allergy Clin Immunol* 2001;107:73-80
18. O.V. Rossi, T. Pirilä, J. Laitinen, E. Huhti, Sinus aspirates and radiographic abnormalities in severe attacks of asthma. *Int Arch Allergy Immunol* 1994;103:209-213
19. G.L. Marseglia, S. Caimmi, A. Marseglia, et al. Occult sinusitis may be a key feature for non-controlled asthma in children. *J Biol Regul Homeost Agents* 2012;26:S125-S131
20. C.G. Fuller 1, J.J. Schoettler, V. Gilsanz, M.D. Nelson Jr., J.A. Church, W. Richards. Sinusitis in status asthmaticus. *Clin Pediatr* 1994;33:712-719
21. M.A. Tosca, C. Cosentino, E. Palleschini, G. Caligo, M. Milanese, G. Ciprandi, Improvement of clinical and immunopathologic parameters in asthmatic children treated for concomitant chronic rhinosinusitis. *Ann Allergy Asthma Immunol* 2003;91:71-78
22. P. Giavina-Bianchi, M.V. Aun, et al. United airway disease: current perspectives. *J Asthma Allergy* 2016;9:93-100
23. Hastan D, Fokkens WJ, Bachert C, et al. Chronic rhinosinusitis in Europe-an underestimated disease. A GA2LEN study. *Allergy*. 2011;66(9):1216-1223.
24. Hirsch AG, Stewart WF, Sundaresan AS, et al. Nasal and sinus symptoms and chronic rhinosinusitis in a population-based sample. *Allergy*. 2017;72(2):274-281
25. Ostovar A, Fokkens WJ, Vahdat K, Raeisi A, Mallahzadeh A, Farrokhi S. Epidemiology of chronic rhinosinusitis in Bushehr, the southwestern region of Iran: a GA2LEN study. *Rhinology*. 2018;57(1):43-48
26. Shi JB, Fu QL, Zhang H, et al. Epidemiology of chronic rhinosinusitis: results from a cross-sectional survey in seven Chinese cities. *Allergy*. 2015;70(5):533-539
27. Fokkens WJ, Lund VJ, Mullol J et al. European Position Paper on Rhinosinusitis and Nasal Polyps 2012. *Rhinol Suppl*. 2012;23:1-298
28. Dietz de Loos D, Lourijns ES, Wildeman M, et al. Prevalence of chronic rhinosinusitis in the general population based on sinus radiology and symptomatology. *J Allergy Clin Immunol*. 2019;143(3):1207-1214
29. Tomassen P, Newson RB, Hoffmans R, et al. Reliability of EP3OS symptom criteria and nasal endoscopy in the assessment of chronic rhinosinusitis-a GA(2) LEN study. *Allergy*. 2011;66(4):556-561
30. Khan A, Vandeplas G, Huynh T, et al. The global allergy and asthma European network (GALEN rhinosinusitis cohort: a large European cross-sectional study of chronic rhinosinusitis patients with and without nasal polyps. *Rhinology*. 2019;57(1):32-42
31. Kowalski ML, Agache I, Bavbek S et al. Diagnosis and management of NSAID-exacerbated respiratory disease (NERD)-a EAACI position paper. *Allergy*. 2019;74(1):28-39
32. Philpott CM, Erskine S, Hopkins C, et al. Prevalence of asthma, aspirin sensitivity and allergy in chronic rhinosinusitis: data from the UK National Chronic Rhinosinusitis Epidemiology Study. *Respir Res*. 2018;19(1):129
33. Wu D, Bleier BS, Li L, et al. Clinical phenotypes of nasal polyps and comorbid asthma based on cluster analysis of disease history. *J Allergy Clin Immunol Pract*. 2018;6(4):1297-305
34. Liao B, Liu J-X, Li Z-Y, et al. Multidimensional endotypes of chronic rhinosinusitis and their association with treatment outcomes. *Allergy* 2018;73(7):1459-1469
35. Tomassen P, Vandeplas G, Van Zele T, et al. Inflammatory endotypes of chronic rhinosinusitis based on cluster analysis of biomarkers. *J Allergy Clin Immunol*. 2016;137(5):1449-1456.e4
36. Langdon C, Mullol J. Nasal polyps in patients with asthma: prevalence, impact, and management challenges. *J Asthma Allergy*. 2016;9:45-53
37. Lin DC, Chandra RK, Tan BK, et al. Association between severity of asthma and degree of chronic rhinosinusitis. *Am J Rhinol Allergy*. 2011;25(4):205-208
38. Shaw DE, Sousa AR, Fowler SJ, et al. Clinical and inflammatory characteristics of the European U-BIOPRED adult severe asthma cohort. *Eur Respir J*. 2015;46(5):1308-1321

Received: 9 October 2020

Accepted: 1 February 2020

Correspondence:

Giorgio Ciprandi

Allergy Clinic, Casa di Cura Villa Montallegro, Genoa, Italy

E-mail: gio.cip@libero.it