Relationship between pain-related comorbidities and quality of life in patients with symptoms of chronic rhinosinusitis

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Abstract

Introduction: Facial pain is a common manifestation of sinonasal disease but this symptom is associated with a variety of other conditions. Misattribution of pain to chronic rhinosinusitis (CRS) may result in worse quality of life in populations both with and without objective evidence of sinonasal disease. The purpose of this study was to determine if there is an association between pain-related comorbidities (PRC) and worse CRS- specific quality of life (QoL) in patients with and without objective evidence of sinonasal inflammation.

Methods: Retrospective cohort study of 299 patients meeting diagnostic criteria for sinusitis evaluated at a tertiary academic medical center from 2017 to 2018. Objective evidence was measured using the Lund-Kennedy and Lund-MacKay scoring systems; for the purposes of this study a score >3 on either scale was considered indicative of disease. Quality of life was determined by the rhinosinusitis disability index (RSDI).

Results: A total of 191 patients were included in the study, with an average age of 52.7. (SD=15.3). The average Lund-Kennedy and Lund-MacKay scores were 4.7 and 8.3, respectively. The average RSDI was 32.1. When stratified by the presence of pain-related comorbidities, there was no significant difference in Lund-Kennedy (p= 0.203), Lund-MacKay (p=0.101), or rhinosinusitis disability index (p= 0.421).

Conclusion: Although prior studies have suggested a correlation between the presence of pain-related comorbidities and worse chronic rhinosinusitis specific quality of life, this relationship was not evident within the current cohort of patients. The relationship between pain and sinusitis specific quality of life is likely complex and requires further research to fully elucidate.

Introduction

Chronic rhinosinusitis is one of the most common chronic medical conditions, with up to 16% of the adult United States population affected.[1] CRS is defined as symptomatic inflammation of the sinuses lasting at least 12 weeks with cardinal symptoms of nasal obstruction, purulent nasal discharge, hyposmia, and facial pain with objective evidence of disease as demonstrated by computed tomography or nasal endoscopy. [2] Facial pain has been shown to have poor correlation with objective evidence of sinonasal inflammation as multiple other pain related comorbidities (i.e. temporomandibular joint dysfunction, migraine, myofascial pain) have been shown to produce similar symptoms.[3] Several modalities exist to determine the impact of CRS on QoL, including the RSDI.[4] To our knowledge, there have been few studies evaluating the effect of PRC on CRS- specific QoL. The goal of our study was to determine if the presence of pain related comorbidities such as TMJD, migraine, cervical spine disease, fibromyalgia, or other neurologic disease would influence CRS-specific QoL. A secondary goal was to determine whether the presence of pain related comorbidities would predict the presence of objective evidence of sinonasal disease.

Methods and Materials

A retrospective cohort study including 299 patients age 18 and older with symptoms consistent with CRS was conducted (see Table 1). Presence of PRC such as fibromyalgia, migraine, TMJD, cervical spine disease, and other neurologic disease not fitting in other categories was recorded. All patients completed RSDI at initial clinic evaluation. Patient were treated with appropriate medications according to the International Consensus Statement on Rhinosinusitis (ICOR) guidelines.[5] Nasal endoscopy was scored using the Lund-Kennedy Scoring system which CT scans were scored using the Lund-MacKay Scoring system.

Results

	Entire Cohort	CRS	No CRS	p-value
Male	75	53	22	0.509
Female	116	87	29	
Age (SD)	52.7 (15.3)	53.1 (15.1)	51.9 (15.9)	0.675
Comorbidities				
--Fibromyalgia	6	3	3	0.189
--Migraine	39	28	11	0.811
--TMJD	6	2	4	0.075
--Cervical Spine	5	4	1	0.118
--Other	27	21	6	0.570
Lund-Kennedy score (SD)	4.68 (3.32)	5.79 (3.18)	1.63 (0.96)	<0.005
Lund-MacKay score (SD)	8.32 (6.62)	9.78 (6.32)	1.13 (0.99)	<0.005
RSDI (SD)				
--Total	32.1 (27.1)	35.1 (28.9)	23.8 (19.2)	<0.005
--Emotional	8.06 (8.81)	8.73 (9.47)	6.21 (6.41)	0.057
--Functional	10.3 (9.26)	10.8 (9.71)	9.05 (7.89)	0.283
--Physical	13.5 (11.1)	14.9 (11.6)	9.51 (8.61)	<0.05

Table 1. Demographics of the study cohort stratified by the presence of objective evidence of CRS.

Clinical Characteristic	Odds Ratio	95% CI	P-values
RSDI	1.02	(1.02, 3.11)	0.011
Presence of Pain Comorbidity	0.79	(0.41, 0.44)	0.489

Table 2. Predictive value of clinical characteristics of the patient population and presence of objective CRS.

Results

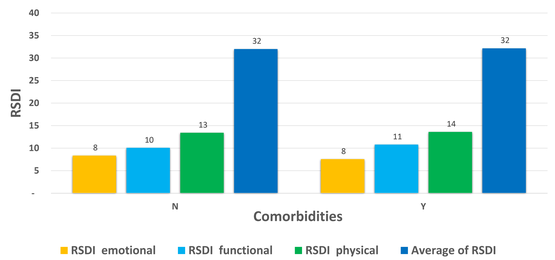

Figure 1. Relationship between RSDI and its sub-scores and the presence of pain-related comorbidities in all patients meeting study criteria.

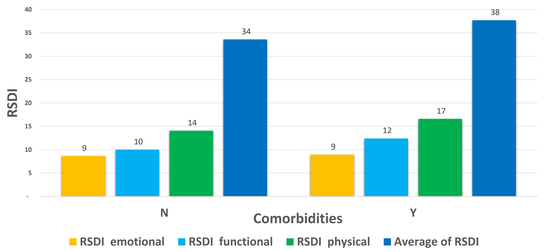

Figure 2a. Relationship between CRS-specific QoL and the presence of pain-related comorbidities in patients with objective evidence of CRS (n=140).

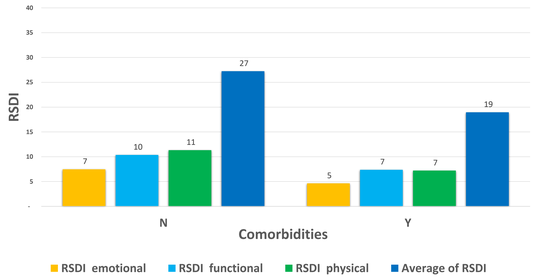

Figure 2b. Relationship between CRS-specific QoL and the presence of pain-related comorbidities in patients without objective evidence of CRS (n=51).

Discussion

Chronic rhinosinusitis is a highly prevalent disease that significantly impacts patients' overall and disease-specific QoL.[2] The impact of CRS on patients' physical and mental well-being is noted to be more severe than that of other chronic disease, demonstrating the significant impact of this problem on affected patients.[6]

Diagnosis of CRS based on symptomatology alone is problematic. Although facial pain can be caused by sinonasal inflammation, a number of other diagnoses can lead to nociceptive symptoms in the head and neck, and thus non-sinogenic pain may frequently be attributed to CRS.[3] Given the overlapping anatomic distribution of symptoms, it is reasonable to suspect that the presence of PRC may lead to worse CRS-specific QoL due to misattribution of pain to a sinonasal source.

Our study was designed to determine if the presence of PRC would result in worse CRS-specific QoL in patients meeting symptomatic criteria for CRS. Given the propensity for misattribution of non-sinogenic pain to CRS, we hypothesized that the presence of PRC would lead to elevated RSDI. Contrary to our hypothesis, the results did not show a positive correlation between presence of PRC and worse disease specific QoL (Figure 1). The lack of association between PRC and QoL held even when subgroup analysis was performed for patients with and without objective evidence of sinonasal disease (Figures 2a-b). Additional analysis revealed that elevated RSDI did not predict the presence of objective evidence of disease on CT or nasal endoscopy. RSDI also failed to correlate with objective evidence of sinonasal disease even when patients were stratified by the presence of PRC. These negative findings support prior research that has demonstrated a poor concordance between sinonasal symptomatology, in this case facial pain, and the presence of objective sinonasal inflammation.

Our study had several limitations. The study cohort may not reflect the general population as all patients were treated at a tertiary academic center by a fellowship trained rhinologist, thus likely reflecting a high number of patients who failed initial therapy. The designation of PRC was based on patient report rather than diagnosis by clinician which could result in over and under reporting based on patient bias. Lastly, comorbid depression is known to significantly contribute to CRS patients' perception of pain, and those with comorbid depression report significantly worse CRS-specific QoL.[7] In our study, the presence of depression was not evaluated.

Conclusions

1. Chronic pain conditions are highly prevalent in the United States population affecting up to 1/3 of the adult population
2. CRS patients often feel their pain symptoms are the most debilitating despite it being shown to have a poor correlation with objective evidence of disease
3. The presence of PRC was found to not correlate with worse disease specific QoL
4. QoL (i.e. RSDI) was also found to be a poor predictor of objective evidence of disease

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