

**Relationship between Chronic/ Recurrent Rhinosinusitis and Anxiety / Depression in Adults**

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**Abstract**

**Objective:** Chronic Sinusitis, as per symptoms, is a disease that has been associated with depression and anxiety in nominal literature. In the literature, regardless of symptoms, the impact of anxiety and depression on patients with a diagnosis of chronic rhinosinusitis is an issue which has not been explained much. In this study we have tried to clarify this subject.

**Materials and methods:** Our study was designed as a prospective study. The group has been formed by including 50 male and 50 female patients aged between 20 and 40 (group 1) and 30 male and 30 female control groups to this study (group 2). Patients and control groups were given BDI (Beck Depression Inventory) and BAI (Beck Anxiety Inventory) to be filled, then the total point averages they received and the number of patients who received over cut off values was compared separately in male and female in group 1 and 2 by SPSS and t-test.

**Results:** In men, while the average total scores received from BDI were  $10 \pm 7$  in Group 1, they were  $15 \pm 13$  in group 2 ( $p < 0.037$ ). While the total scores received from BAI were detected as of  $11 \pm 6$  in group 1, they were  $16 \pm 13$  in group 2 ( $p < 0.014$ ). In women the total scores received from BDI were detected as of  $11 \pm 8$  in group 1 while it was  $17 \pm 14$  in group 2 ( $p < 0.032$ ).

While the total scores received from BAI were  $12 \pm 7$  in group 1, in group 2 they were detected as of  $19 \pm 17$  ( $p < 0.001$ ).

**Conclusion:** As a result, significant relationship between chronic rhinosinusitis and anxiety/depression in both sexes and groups were found.

**Keywords:** Rhinosinusitis; Anxiety; Depression; Adults.

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**Introduction**

Chronic rhinosinusitis is a very common pathology that reveals itself in many forms.

Its prevalence in the United States of America has been defined as 15.5% and is equal to second most often one in this chronic disease [1]. These rates in some studies are thought to be greater than anticipated [2,3]. Facial pain in chronic rhinosinusitis is a disease that presenting itself with complaint

of suffering of reduction in anterior or posterior nasal discharge and diminished smell perception that lasts longer than 12 week [4]. It can be difficult to cope with these long term complaints. Many situations such as age, culture, physical and mental capacity can affect the patient's subjective complaints [5]. Apart from that, 2 common psychiatric disorders, the symptoms of depression and anxiety can influence [6].

A major depressive disorder is a disease affecting approximately more than 10 million Americans seriously and

can lead to serious dysfunction between ages of 15 -44 years [7,8]. Similarly, anxiety disorder is a disease that approximately 15 million Americans seriously suffer from [9]. When we look at the prevalence of chronic rhinosinusitis with depression in patients, we see that it is between 20% and 25% from the literatures. Again, these two diseases have been associated with increase in situations such as hospital apply and antibiotic use [6,9].

When we look at the studies that carried out relating to how these diseases increase chronic symptoms and how chronic diseases increase the tendency of anxiety and depression, it is stated that comorbid psychiatric diseases response of a specific cytokine, and thus that formed a circle chronic proinflammatory by affecting central nervous system and hypopituitary adrenal axis [10,11]. Again according to some studies in the literature both pain and mood process the anterior cingulate cortex in the brain and the insula and the anxiety can trigger depression and pain perception [12]. Unlike this case, in chronic pain and infection, depression and anxiety may be a predisposing factor [6].

According to the literature review we have conducted, although chronic diseases may have effects over the anxiety, and depression and anxiety/ depression may increase chronic rhinosinusitis symptoms and we have not come across the related studies much, we have encountered very few literature reviews that examine chronic sinusitis anxiety and depression directly [13,14]. Therefore, in this study, dependently from the symptoms, we consider it appropriate to examine the effect of chronic rhinosinusitis over anxiety and depression by Beck depression and Beck anxiety inventory.

## Materials and Methods

### *Patients determined criteria*

This study has been carried out on patients admitted to Selahaddin Eyyubi State Hospital and Gazi Yasargil Education and Research Hospital with chronic sinusitis by filling out the forms of Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI). The study was conducted between 2016 March and 2017 January. In this study, ethics committee approval has been taken from Selahaddin Eyyubi Public Hospital. For this study, it was planned to select patients between 20-40 years of age who do not have chronic disease, psychiatric illness, chronic migraine and tonsilopharyngitis, non-smoking and non-use of known drugs. To this study 50 men and 50 women with chronic rhinosinusitis and as for control group 30 men and 30 women were planned to be included. All patients were evaluated with nasal endoscopy and CT and the patients with nasal polyps and serious septal deviation were excluded.

### *Chronic rhinosinusitis*

According to the European Position Paper on Rhinosinusitis and Nasal Polyps 2012 [4]. If anyone has 2 or more complaints out of rhinosinusitis in adults like nasal congestion, nasal

discharge, facial pain or pressure, reduction in the sense of smell, it is defined as the nose or paranasal sinuses inflammation. If complaints take 12 weeks and longer it is described as chronic rhino sinusitis [4].

### *Psychiatric assessment*

The severity of depression was assessed using BDI, which is a 21 item self-report scale developed by Beck et al. [15]. Items in the scale are rated from 0 to 3 in increasing order of severity. Item scores are totalled and can range from 0 to 63. Higher scores correlate with more severe depression. The pathologic cut-off value for the BDI score was determined to be 17 in the Turkish population, which reflects moderate and severe depressive states [16,17]. The validity and accuracy of the BDI in the Turkish population have been studied by Hisli et al. [18]. Anxiety is measured using the 21-item self-reported BAI [19]. Each item is scored from 0 to 3 according to severity. Item scores are totalled and higher scores indicate higher anxiety levels. The pathologic cut-off value for the BAI score was determined to be 16 in the Turkish population; scores above this value reflect moderate to severe anxiety states [16,17]. The validity and reliability of the Turkish version of the BAI have been studied by Ulusoy et al. [20].

### *Statistical analysis*

The patients and control group were analyzed with SPSS 20 and independent t test, men and women were analyzed statistically among themselves. Colmogorov smirnov and Shapiro wilk-w tests were performed for the normal distribution of groups and the groups were observed to have normal distribution.

## Results

### *In male sex*

In group 1 the average age was detected as for  $26.4 \pm 7.3$ , in group 2 it was  $28.4 \pm 11.5$ . There was no significant difference between groups ( $p < 0.254$ ). The average total scores of Beck Depression Inventory were  $10.3 \pm 7.3$  in group 1 and  $15.6 \pm 13.2$  in group 2. With regards to total scores average, group 2 was significantly found higher compared to group 1 ( $p < 0.037$ ) (Table 1). The scores received from Beck depression inventory determined that in group 1, one person, in group 2, 7 people were above the pathological cut-off value. In terms of number of patients that are above and below the cut-off the value between group 1 and group 2 was of statistically significant differences ( $p < 0.009$ ).

The average total scores of Beck's Anxiety Inventory was  $11.4 \pm 6.3$  in group 1 and was  $16.4 \pm 13.7$  in group 2. Significant differences were found between the groups in terms of average total scores of the Beck Anxiety Inventory ( $p < 0.014$ ). According to the scores received from Beck Anxiety Inventory, 1 person in Group 1, 8 people in group 2 were over pathologic cut off values. Statistically significant difference was detected

in terms of being above or under the cut-off value between group 1 and group 2 ( $p < 0.007$ ).

**In female sex**

In group 1, the average age was  $30.4 \pm 12.5$ , in group 2 it was  $33.2 \pm 9.7$ . Significant difference was not detected ( $p < 0.107$ ). The average score of Beck Depression Inventory was  $11.6 \pm 8.3$  in group 1 and  $17.1 \pm 14.3$  in group 2. In terms of the average total score, group 2 was significantly higher compared to group 1 ( $p < 0.032$ ). The scores obtained from Beck Depression Inventory were above the pathological cut off values in 1 person in group 1, in 9 persons in group 2. In terms of being above and under the cut-off value between group 1 and group 2 a statistically significant difference was detected ( $p < 0.001$ ).

The average total scores of Beck Anxiety Inventory were  $12.5 \pm 7.7$  and were  $19.2 \pm 17.1$  in group 2. In terms of the average total score received from Beck Anxiety Inventory, significant differences between the groups were detected ( $p < 0.001$ ). The scores obtained from Beck's Anxiety Inventory were detected as above pathological cut-off value in 1 person in group 1, in 10 persons in group 2. In terms of being above and below the cut-off value between group 1 and group 2 statistically significant difference was detected ( $p < 0.001$ ).

**Table 1:** Beck scores of anxiety/depression in male and female.

	Group 1 average	Group 2 average	p value
Male BDS	$10.3 \pm 7.3$	$15.6 \pm 13.2$	$p < 0.037$
Male BAI	$11.4 \pm 6.3$	$16.4 \pm 13.7$	$p < 0.014$
Female BDI	$11.6 \pm 8.3$	$17.1 \pm 14.3$	$p < 0.032$
Female BAI	$12.5 \pm 7.7$	$19.2 \pm 17.1$	$p < 0.001$

**Discussion**

The relationship between chronic diseases and depression / anxiety is a state of being introduced in many studies. It has been disclosed in some of the studies in the literature that mood and pain have been processed in the same regions of the brain [12]. In this case, it is a situation that increases the mood pain perception [12] and that the pain can affect mood [6] is already disclosed in various literature. Although rhinosinusitis chronic as a chronic inflammation is associated with chronic depression and anxiety in this way, unlike other chronic inflammations it causes the complaints such as the runny nose, sputum, loss of smell and this affects the person negatively. In our review of the literature on this subject, we have considered to examine the effect of rhinosinusitis, which wasn't studied much, on anxiety / depression. In males, according to group 2 and group 1, in terms of the total average scores ( $p < 0.037$ ) received from Beck Depression Inventory and in terms of comparing the numbers above the cut off values of the scores ( $p < 0.009$ ) taken from Beck Depression Inventory, a statistically significant difference was detected. In males, in terms of comparing the total scores ( $p < 0.014$ ) received from

Beck Anxiety Inventory and in terms of comparing the number of patients received from Beck Anxiety Inventory that above the cut off values ( $p < 0.007$ ), group 2 was found statistically significant high comparing group 1.

In females, according to group 2 and group 1, in terms of the total average scores ( $p < 0.032$ ) received from Beck Depression Inventory and in terms of comparing the numbers above the cut off values of the scores ( $p < 0.001$ ) a statistically significant difference was detected. In females, in terms of comparing the total scores ( $p < 0.001$ ) received from Beck Anxiety Inventory and in terms of comparing the number ( $p < 0.001$ ) of patients received from Beck Anxiety Inventory that above the cut off values, group 2 was found statistically significant high comparing group 1.

When we look at the studies in the literature, in many studies before and after sinus surgery while seeing the effect of depression or quality of life [10,21] and the effect of anxiety on chronic rhinosinusitis symptoms [22-24] or quality of life studies performed associated with loss of smell [25]. We have also seen that the number of studies on chronic rhinosinusitis and anxiety/ depression were limited [13,26,27]. In these studies we have seen the relationship of anxiety/ depression and sinusitis symptoms were studied most.

In 2014 while Katatomichelis et al. [26], in a study with 108 patients, found olfaction loss associated with depression and anxiety, in patients without loss of olfaction only female patients in low-income group were found in association with depression. In our work in the control group when compared with both male and female patients, we saw the increase in chronic rhinosinusitis with significant rate and the scores received from depression and anxiety inventory. Especially considering that both patients and the patients including the loss of olfaction in control group not distinguished, our study is inconsistent with this literature. In the study conducted by Chung et al. [27] in 2015, only the patients with anosmia have been associated with depression.

In the study conducted by Nayankar and friends a significant relationship was found between sinusitis symptoms and anxiety / depression scores. In the study conducted by Toumum et al. [13] a statistically significant relationship between rhinosinusitis disability index and anxiety/depression was observed. Although our study is seen in the same direction with Nayankar [24] and Toumum's study [13], we believe that our study brings a different perspective to the literature from a few angles. Finally, two studies in 2015 [28] and 2016 [29] found a significant relationship between chronic rhinosinusitis and anxiety. These two studies support the results of our study. While many studies in the literature have been associated with sinusitis symptom scores and anxiety or olfaction with loss and depression, in our study especially selecting patients with chronic diagnosis of rhinosinusitis is considered as one of the different perspectives.

Again, unlike the studies in the literature, beside patients' total score averages taken from Beck Anxiety and Depression Scale while comparing the number of patients in the patient group

and control group above the cut-off value considered as one of the benefits of this work, but our having limited number of patients can be seen as a drawback in our study.

## Conclusion

As a result, our study, regardless of the chronic rhinosinusitis symptoms scores and olfaction, it is associated with high anxiety and depression. Although revealed in both sexes, expanding of the literature which is rare on this subject, the elimination of contradictions with larger studies to be carried out serially, are considered to be an awaiting working space for researchers.

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