



CLINICAL STUDY

CHRONOTYPE AND QUALITY OF LIFE IN PATIENTS WITH ALLERGIC RHINITIS

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SUMMARY

Objective: The aim of this study is to investigate the coronotypes and quality of life of patients with allergic rhinitis.

Material Method: Our patient group consisted of 100 patients and our control group consisted of 74 patients. The patients with allergic rhinitis and the control group were selected from patients who did not have any other psychiatric or comorbid diseases and did not use any medication. First, patients with symptoms for at least 6 months were diagnosed with allergic rhinitis with appropriate examinations , followed by morning-evening test (MEQ) and quality of life test (SF-36). Results were compared statistically.

Results: The average age of our study group is 32.03 ± 8.31 . There was no difference between the control group and the patient group in terms of age, gender and socioeconomic status. The number of those who were close to the evening type and definitely close to the evening type was higher in the patient group and it was statistically significant. It was observed that the parameters showing the quality of life in the evening type patients were worse.

Conclusion: This study shows that patients with allergic rhinitis tend to have the evening type. This also reduces the quality of life. This shows us that the sleep and psychological states of patients with allergic rhinitis are also affected by the disease and this should be taken into consideration.

Keywords: Allergic rhinitis, chronotype, quality of life

ALERJİK RİNİTLİ HASTALARIN KRONOTİPİ VE HAYAT KALİTELERİ

ÖZET

Amaç: Bu çalışmanın amacı, alerjik rinitli hastaların kronotiplerini ve yaşam kalitelerini araştırmaktır.

Materyal Metod: Hasta grubumuz 100 hastadan, kontrol grubumuz 74 hastadan oluşmakta idi. Alerjik rinitli hastalar ve kontrol grubu başka bir psikiyatrik veya ek hastalığı olmayan ve herhangi bir ilaç kullanımı olmayan hastalardan seçilmiştir. Öncelikle en az 6 ay semptomu olan hastalara, uygun tetkik ve incelemelerle alerjik rinit tanısı konuldu, ardından sabah-akşam testi (MEQ) ve yaşam kalitesi testi (SF-36) yapıldı. Sonuçlar istatistiksel olarak karşılaştırıldı.

Sonuçlar: Çalışma grubumuzun yaş ortalaması $32,03 \pm 8,31$ 'dir. Kontrol grubu ile hasta grubu arasında yaş, cinsiyet ve sosyoekonomik durum ile ilgili bir farklılık bulunmamakta idi. Hasta grubunda akşam tipine yakın ve kesinlikle akşam tipine yakın olanların sayısı daha yüksekti ve istatistiksel olarak anlamlıydı. Akşam tipi hastalarda yaşam kalitesini gösteren parametrelerin ise daha kötü olduğu görüldü.

Sonuç: Bu çalışma, alerjik rinitli hastaların akşam tipi olma eğiliminde olduğunu göstermektedir. Bu aynı zamanda yaşam kalitesini de düşürmektedir. Bu da bize, alerjik rinitli hastaların uyku ve psikolojik durumlarının da hastalaktan etkilendiğini ve bunun da göz önünde bulundurulması gerektirdiğini göstermektedir.

Anahtar Sözcükler: Alerjik rinit, kronotip, yaşam kalitesi

INTRODUCTION

Allergic rhinitis, one of the most common chronic diseases, is seen in 20% of adults and 42% of children ¹. Symptoms of allergic rhinitis are nasal discharge, nasal congestion, nasal itching, discomfort in eyes and

watery eyes ². These nasal symptoms may impair the concentration and night sleep ³. This results in chronic fatigue, which may lead to depression and anxiety in the patient. In fact, allergic rhinitis disease, which can be regarded as a simple disease, can reduce the quality of life ⁴. It has also been reported that people who have allergic rhinitis are more anxious, obsessive and neurotic than those who are not allergic ⁵.

The effect of allergic rhinitis on sleep is explained by various mechanisms. In addition to mechanical effects, such as nasal congestion and sleeping posture, A significant number of mediators associated with inflammation in allergic rhinitis also play a vital role in the pathophysiology of sleep disorders. One of these mediators is the vasodilator ⁶ and the histamine

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that acts as a potent stimulator of vascular permeability⁷ and mucus secretion.

Daytime sleepiness, chronic fatigue, increased traffic accidents and personality changes may occur in patients due to impaired sleep quality⁸.

The biological changes observed in human metabolism during the day (24 hours) are called "circadian" or "diurnal" rhythms⁹. Human body temperature, hormonal system and other biological systems have a distinct daily cyclic system. These cycles play an important role in many molecular and behavioral processes. The preferences of individuals regarding the timing of sleep and other behaviors are defined as chronotypes and chronotypes are classified according to the tendency of individuals to be evening and morning¹⁰. According to this classification, it is stated that morning types sleep early in the evening and wake up early, their performances are better in the morning, evening types sleep late in the night, they can wake up in the morning with difficulty and their performance is better in the afternoon¹¹. Factors affecting the chronotypes of individuals include various factors such as genetic characteristics, age, ethnicity and gender¹². Chronotype can be evaluated simply by a questionnaire.

The present study aims to investigate the morning-evening chronotype of the allergic rhinitis patients, to determine its frequency, and to investigate the quality of life of these patients.

MATERIAL and METHODS

The required approval was obtained from the ethics committee of the university for this study (18920478-050.04.04-E.1800143927). The study, which was carried out with the patients diagnosed with allergic rhinitis in our otolaryngology clinic of the university hospital, included 100 patients. The study group has been chosen between the ages of 18-50. The diagnosis was made by endoscopic examination and patient symptoms. Patients with symptoms for at least 6 months were selected. The patient group consisted of people who did not have any internal disease, had no psychiatric disorder and had no genetic psychiatric disease in their family. The patients who use medication which could affect sleep status and psychological status were

excluded from the study. In addition, the patients with septum deviations, nasal polyps or other pathologies, which could increase nasal obstruction, were excluded from the study. The control group consisted of 74 healthy individuals of the same age group with no history of allergic rhinitis and additional disease, sleep disorder or psychiatric discomfort.

After the participants were informed and a written informed consent form was obtained from each patient, the morning-care test (MEQ) and life quality test (SF-36) were applied.

Morning - Evening Type Scale (MEQ):

It is a Likert type scale consisting of 19 questions. Possible answers are given in 4 options. Each option is clearly schematized. Timetable is used in the answers to questions 1, 2 and 10. This timetable is divided into 15-minute timeframes and shows a 7-hour timeframe. The other questions are in the form of multiple choice questions. The points obtained from questions differed as follows: 1-4 points for questions between 3 and 9 and between 13 and 16; 1-5 points for questions 1, 2, 10, 17 and 18; 0-6 points for questions 11 and 19; 0-5 points question 12. The scores obtained point to five different types of circadian rhythm: a total of 70-86 points indicate "absolutely morning type", a total of 59-69 indicate "close to the morning type", a total of 42-58 points indicate "intermediate type", a total of 31-41 points indicate "close to the evening type", and a total of 16-30 points indicate "absolutely evening type". The validity and reliability study of the Turkish version of the MEQ scale was performed by Pündük et al¹¹.

Quality of life (SF 36):

SF 36 is one of the most common scales used to measure quality of life. Ware et al.¹³ developed this test in 1992 and the Turkish validity and reliability study was conducted by Koçyiğit et al.¹⁴. The scale consists of 36 items, which measure 8 dimensions, namely physical function (10 items), social function (2 items), physical role difficulty (4 items), emotional role difficulty (3 items), mental health (5 items), energy / vitality (4 items), pain (2 items) and general perception of health (5 items). The second question of the scale inquires about the



individual's perception regarding the change in health in the last 12 months while the other questions are evaluated by considering the last four weeks before the implementation of the test. The fourth and fifth questions of the scale are Yes/No questions while the other questions are Likert type (3, 5 and 6). 1, 6, 7, 8, 9a, 9d, 9e, 9h, 11b, 11d items are reversed and their score is calculated. The subscales evaluate health from 0 to 100, where 0 indicates poor health while 100 indicates good health.

Statistical analysis

Data were analyzed using SPSS Package Program version 20.0. Frequency, percentage, arithmetic mean, standard deviation, median, minimum and maximum values were used in the presentation of the descriptive data. The appropriateness of the variables to normal distribution was examined by Shapiro-Wilk test according to the number of patients in the groups. Non-parametric tests were preferred as analysis methods when sample size and normal distribution test were examined. Mann Whitney U test was used to compare age and continuous variables. Continuity-corrected chi-square test and Fisher's exact test were used to compare categorical variables between treatment groups. Kruskal Wallis Test was used to compare the continuous variables between the three groups. A p-value below 0.05 was considered statistically significant.

The relationship between variables was examined by Spearman Correlation Analysis. In the evaluation of the correlation '0.00-0.24: weak, 0.25-0.49: moderate, 0.50-0.74: strong, 0.75-1.00: very strong relationship' was interpreted as ¹⁵.

RESULTS

The mean age of our patient group was $32,03 \pm 8,31$, 60 were female and 40 were male. The mean age of control group was $30,45 \pm 8,00$, 34 were male and 40 were female. There was no difference between the control group and the patient group in terms of age, gender and socioeconomic status ($p > 0.05$).

There were absolutely no morning-type patients in our study group. The highest number of patients was in the group of intermediate type. When we look at the groups of close to the evening type and the evening type, we see that the number of patients in our study group is very high in both of them compared to the control group. There was a statistically significant difference between groups in terms of close to morning type, close to evening type and definitely evening type ($p = 0.021$) (Table 1)

We compared the scores of quality of life subscale in the patients (Table 2). It was observed in evening type patients that physical and emotional roles difficulty were more, pain was more, the general health perception was worse, their social functions were worse, their mental health was worse, and these were statistically significant. In general, it was seen that the parameters that show the quality of life were better in patients with morning type. This has shown us that the quality of life of allergic rhinitis patients, which are generally close to the evening type, has been decreased.

Correlation analysis results

Spearman correlation analysis was used to determine whether continuous variables were altered in the patient group. There was a weak negative correlation between age and vitality score ($r = -0.227$, $p = 0.043$). There was a weak positive correlation between emotion and MEQ score ($r = 0.228$, $p = 0.042$).



Table 1. Comparison of patient and control groups according to MEQ scale

Variables	Patient group (n=100)		Control group (n=74)		p
	n	%	n	%	
Definitely morning type (70-86)	-	-	-	-	
Close to morning type (59-69)	16	16	10	13,5	0.021
Intermediate type (42-58)	54	54	54	72.9	
Close to evening type(31-41)	18	18	9	12.2	
Definitely evening type (16-30)	12	12	1	1,4	

n: number,%: column percentage, p: chi-square test



Table 2. Evaluation of the quality of life of patients according to the chronotype

	Close to evening type and evening type	Intermediate type	Morning type	
	Median (Min-Max)	Median (Min-Max)	Median (Min-Max)	p value*
Physical function	11.5 (10.00-17.00)	14.00 (10.00-20.00)	18.00 (11.00-20.00)	<0.05
Physical role difficulty	6.00 (4.00-8.00)	6.00 (4.00-8.00)	4.00 (4.00-8.00)	>0.05
Pain	8.00 (2.00-10.00)	7.00 (2.00-12.00)	5.00 (3.00-11.00)	<0.05
General health	11.00 (7.00-23.00)	13.00 (5.00-23.00)	16.00 (8.00-21.00)	<0.05
Vitality	12.00 (4.00-22.00)	14.00 (5.00-24.00)	14.00 (7.00-21.00)	>0.05
Social function	4.00 (3.00-10.00)	5.00 (2.00-10.00)	7.00 (2.00-9.00)	<0.05
Emotional role difficulty	3.00 (3.00-5.00)	4.00 (3.00-6.00)	5.00 (3.00-6.00)	<0.05
Mental health	13.00 (11.00-17.00)	13.00 (5.00-22.00)	15.00 (11.00-20.00)	<0.05

Min: Minimum, Maks: Maximum, p: Mann Whitney U Test, *: Kruskal Wallis Test



DISCUSSION

Allergic rhinitis may cause the patient not to work due to severe symptoms. These severe symptoms may even cause mental problems in patients, who may not be understood by their family and friends¹⁶. As a result, it can cause extreme unhappiness and despair. Previous studies have reported that many patients complain about problems related to fatigue, anxiety, and depressive mood in allergy seasons¹⁷. In our study, we found that patients' quality of life decreased and therefore we think that the susceptibility to depression increased.

Evening type seems to affect life from many aspects. More attention-related problems, emotional problems¹⁸, less school attendance and lower academic performance are observed in students with evening rhythm¹⁹. It has been found to affect different eating habits in the morning and evening individuals²⁰. In a study conducted with fifty-two adults, it was reported that evening individuals had higher body mass index (BMI), energy intake and fast-food consumption were higher after evening, fruit and vegetable consumption was lower²¹. Therefore, this issue is still of interest. However, no studies have been conducted to date on how the allergic rhinitis affects the chronotype.

Studies have shown that the symptoms and laboratory parameters of allergic diseases exhibit a significant ~ 24 hour variation. For example, in most patients with allergic rhinitis, symptoms worsen overnight or early in the morning. Accordingly, dose adjustment of anti-allergy drugs provides benefits in such patients. Although the circadian pathophysiology of allergic diseases is well documented, the biological basis of this phenomenon is poorly understood. Recent studies have begun to show that the internal time processing system, called the circadian clock, plays an important role in the temporal regulation of the allergic reaction and therefore may be the underlying cause of the circadian pathophysiology of allergic diseases²². According to classification, the people of morning type get up early in the morning, feel better during the morning hours and their performances are better in the morning hours

than in the evening hours. On the other hand, the people of evening type can have difficulty waking up in the morning, they feel better in the afternoon and their performance is better in the afternoon²³.

In our study, we found that these patients were very likely to be evening type and these conditions affected the living conditions of the patients and decreased their quality of life. To improve the quality of human life, it is necessary to stay away from depression and anxiety, to have regular sleeping hours and to be active during working hours. Therefore, patients with allergic rhinitis should be given the most effective treatments to improve the quality of life and patients should be followed closely.

CONCLUSION

This study shows that patients with allergic rhinitis are evening types and this decreases their quality of life. More importance should be given to the treatment of patients with allergic rhinitis. This shows us that allergic rhinitis has a social dimension, on which we recommend further studies should focus.

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