

Rosacea disease and *Demodex* spp. relationship; Retrospective study

Rosacea hastalığı ve *Demodex* spp ilişkisi; Retrospektif çalışma

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SUMMARY

Objective: Purpose of this study is to determine the prevalence of *Demodex* spp. among the patients diagnosed with Rosacea.

Method: In our study, the patient group who visited Sivas Numune Hospital Dermatology Outpatient Clinic between January 01, 2018 and September 25, 2018, and was diagnosed with Rosacea was observed with respect to *Demodex* spp. Samples were taken from 338 patients with the procedure of Standardized Skin Surface Biopsy (SSSB).

Results: The presence of *Demodex* spp. was found to be positive in 166 (49.1 percent) of 338 rosacea patients. When the patients are evaluated based on gender, 17 (28.9 percent) of 59 male patients and 136 (48.7 percent) of 279 female patients were detected to have *Demodex* spp. and this difference was statistically significant (Table 1). Positivity of *Demodex* spp. based on gender was deemed statistically significant ($p < 0.05$). As a result of the analysis by gender groups, *Demodex* spp. was identified in 13 (23.6 percent) of 55 rosacea patients under the age of 20 years, 75 (48.7 percent) of 154 patients between the age of 20 and 40 years and 78 (60.4 percent) of 129 patients over the age of 40 years and the difference between groups was statistically significant ($p < 0.05$, Table 2). Positivity of *Demodex* spp. based on age groups was found statistically significant ($p < 0.05$).

Conclusions: It was surmised that *Demodex* spp. plays an important role in aetiopathogenesis of rosacea disease, this parasite should be considered during the treatment planning of the disease and rosacea patients should be investigated in terms of *Demodex* spp.

Keywords: Rosacea, *Demodex* spp, Retrospective study

ÖZET

Amaç: Bu çalışmanın amacı rosacea tanısı konmuş hastalarda *Demodex* spp. yaygınlığını belirlemektir.

Yöntem: Çalışmamızda Sivas Numune Hastanesi Dermatoloji polikliniğine 01.01.2018 ve 25.09.2018 tarihleri arasında gelen ve rosacea tanısı konmuş hasta grubu *Demodex* spp yaygınlığı açısından incelendi. Çalışmada 338 hastadan standart deri yüzey biyopsisi (SDYB) yöntemi ile örnekler alındı.

Bulgular: Üçyüz otuz sekiz rosacea hastasının 166 (%49,1)'sında *Demodex* spp. pozitif bulundu. Bu durum cinsiyete göre değerlendirildiğinde 59 erkek hastada *Demodex* spp. pozitifliği 17 (%28,8) iken 279 kadın hastanın 136 (%48,7) idi ve bu fark istatistiksel olarak anlamlıydı (Tablo 1). Cinsiyete göre *Demodex* spp. pozitifliği istatistiksel olarak önemli bulundu ($p < 0,05$). Yaş gruplarına göre yapılan inceleme sonucunda 20 yaşın altındaki rosacea hastalarında 55 hastanın 13 (%23,6)'ünde, 20-40 yaşları arası hastaların 75 (%48,7)'inde, 40 yaş üzeri 129 hastanın ise 78 (%60,4)'inde *Demodex* spp. saptandı ve gruplar arası fark istatistiksel olarak anlamlıydı ($p < 0,05$, Tablo 2). Yaş gruplarına göre *Demodex* spp. pozitifliği istatistiksel olarak önemli bulundu ($p < 0,05$).

Sonuç: Rosacea hastalığının etiopatogenezinde *Demodex* spp. nin önemli rolü olduğu, bu hastalığın tedavisi planlanırken bu parazitin göz önünde bulundurularak, rosacea hastalarının *Demodex* spp. açısından araştırılması gerektiği kanısına varılmıştır.

Anahtar sözcükler: Rosacea, *Demodex* spp, Retrospektif çalışma

INTRODUCTION

Rosacea is a prevalent dermatologic disease that is seen in approximately 3 percent of society and affects center region of face¹. It is characterized by central fascia erythema, telangiectasia, papule and pustular lesions which can be observed in face temporarily or permanently. The most frequent symptoms of the disease are burning, redness, swelling, dryness and eye lesions. Rosacea is divided into four types: erythematotelangiectatic, papulopustular, phymatous and ocular rosacea². Rosacea is usually seen between the age of 30 and 50 years and more prevalent in females than in males. The disease is observed more commonly in the individuals with one or two skin types according to Fitzpatrick classification scale³.

Although the cause of rosacea is not clarified exactly in literature, the frequent causes can be listed as immune dysregulation, vascular diseases, external causes, degeneration of connective tissue elements, dysfunction of pilosebaceous unit, chemical factors and infections¹. The foremost factor related to rosacea among infections is *Demodex* spp. parasite. In the studies conducted with rosacea patients, density of *Demodex* spp. was found to be significantly higher than that in the control group which does not have rosacea disease⁴.

There are more than 100 species of *Demodex* parasites². Two species were identified to live in human skin: *Demodex folliculorum* and *Demodex brevis*. Bodies of both types are worm-like with a length of 0.1 -0.4 mm. They generally live in hair follicles and sebaceous glands in face region of humans in which they are commonly seen⁵.

This study is a retrospective study which determines the prevalence of *Demodex*spp. in rosacea patients who consulted Sivas Numune

Hospital Dermatology Outpatient Clinic between January and September, 2018.

MATERIAL AND METHODS

In our study, the patient group who visited Sivas Numune Hospital Dermatology Outpatient Clinic between January 01, 2018 and September 25, 2018, and was diagnosed with rosacea was observed with respect to *Demodex*spp. Samples were taken from 338 patients with the procedure of Standardized Skin Surface Biopsy (SSSB). For this purpose, a circle with a diameter of almost 1.12 was drawn on the surface of lame with a glass dip pen. A drop of cyanoacrylate (super glue) was applied to inner area of the circle on the other side of lame. Later, the sticky side of lame was pressed onto the skin of patient and kept there for about one minute. After a while, the lame was lifted up slowly. A drop of immersion oil was applied to the sample and the sample was covered with lame. Preparations analyzed with a magnification of 10x and 40x were evaluated with regard to *Demodex* spp.⁶.

Statistical Analysis

The data obtained in our study was loaded to SPSS (Ver: 22.0). Parametric test assumptions could not be fulfilled in the evaluation of data, so chi square test was used and 0.05 was applied as level of significance.

RESULTS

A total of 338 rosacea patients were included in the study by Sivas Numune Hospital Dermatology Outpatient Clinic. Of the patients, 59 (17.4 percent) and 279 (82.6 percent) were males and females, respectively. Of 338 patients, 55 (16.3 percent) were under the age of 20 years, 154 (45.5 percent) were between the age of 20 and 40 years, and 129 (38.2 percent) were over the age of 40 years (Table 1-2).

Table 1: *Demodex* spp. gender distribution

Groups	Pozitive		Negative	
	N	%	N	%
Male	17	28,8	42	71,2
Female	136	48,7	143	51,3
Khi kare: $p < 0,05$, N: Number of patients				

Table 2: *Demodex* spp. distribution by age

Groups	Pozitive		Negative	
	N	%	N	%
<20	13	23,6	42	76,4
20-40	75	48,7	79	51,3
>40	78	60,4	51	39,6
Khi kare: $p < 0,05$, N: Number of patients				

In consequence of the research, presence of *Demodex* spp. was found to be positive in 166 (49.1 percent) of 338 rosacea patients. When the patients are evaluated based on gender, 17 (28.9 percent) of 59 male patients and 136 (48.7 percent) of 279 female patients were detected to have *Demodex* spp. (Table 1). Positivity of *Demodex* spp. based on gender was deemed statistically significant ($p < 0.05$). As a result of the analysis by gender groups, *Demodex* spp. was identified in 13 (23.6 percent) of 55 rosacea patients under the age of 20 years, 75 (48.7 percent) of 154 patients between the age of 20 and 40 years and 78 (60.4 percent) of 129 patients over the age of 40 years (Table 2). Positivity of *Demodex* spp. based on age groups was found statistically significant ($p < 0.05$).

DISCUSSION

Distribution of *Demodex* species is cosmopolitan. Even though the pathogenicity of this parasite is still contradictive, there are several researches that indicate the role of the parasite in aetiopathology of numerous dermatologic diseases^{7,9}. It was identified that the prevalence of parasites increases in direct proportion to age. The first *Demodex folliculorum* fact in human in our country was detected after the analysis of the preparation taken from perineal region through cellophane band method^{10,11}. Presence of *Demodex* spp. in human tissue as an imperious and

permanent parasite in human skin, and its prevalence which rises in direct proportion to age complicate determination of the pathogenicity of this factor. However, the density of *Demodex folliculorum*/ cm² is substantial in cases of rosacea, perioral dermatitis, seborrheic dermatitis and micropapular itchy dermatitis, and prognosis of these diseases improves gradually after the specific treatments against the mite, therefore it makes think that the mite has a role in pathogenesis of such diseases¹¹.

Age is a significant factor in the prevalence of *Demodex* spp. Thus, it is more commonly found in older individuals. The prevalence rate which is 20 percent among the group under the age of 20 years goes up as the age rises. In another study conducted with 47 Chronic Renal Failure (CRF) patients and control group in Sivas, skin samples from cheek and eyelashes were analyzed. Of 47 CRF patients, 6 (12.76 percent) and 12 (23.53 percent) were detected to have *Demodex folliculorum* in their eyelash follicles and in their faces, respectively. In control group, *Demodex folliculorum* was found in eyelash follicles of 2 (5.26 percent) individuals and in face of 7 (18.42 percent) individuals¹². Additionally, many studies assert the important role of *Demodex* spp. in pathogenesis of rosacea disease. In a study, *Demodex* spp. was screened among the patients prediagnosed with rosacea. *Demodex folliculorum*

was identified in 5 (17.85 percent) male and 10 (35.71 percent) female cases whereas *Demodex brevis* was seen in 2 (7.14 percent) female cases. Thus, 17 (60.7 percent) of 28 cases were found to have *Demodex* spp. It was concluded in this study that primary investigation of the suspicious rosacea lesions especially in face region of humans with regard to *Demodex* spp. will be useful for early diagnosis and treatment¹³. As part of another study, 197 patients (117 rosacea patients, 29 acne vulgaris patients and 51 patients with other allergic complaints) were examined with the procedure of SSSB. The presence of mite was found to be positive in 97 (49.23 percent) of 197 patients. Even though no statistically significant difference was determined, positivity in rosacea and negativity among the patients under the age of 20 years were detected to be significantly high. Eventually, it was surmised that it is essential for the patients with various allergic skin diseases, particularly for rosacea patients over the age of 20 years to be investigated in terms of infestation of *Demodex* spp.⁵. A study which included the cases clinically and histopathologically diagnosed with demodectic rosacea was performed to search the effects of permethrin 5% cream and metronidazole 0.75% gel on severity score of rosacea and on one of the lesions, *Demodex* eradication. The researchers concluded in this study that permethrin 5% cream may have anti-inflammatory effects as well as acaricidal effect on *Demodex* spp. among rosacea patients, and may be a new alternative drug in this treatment. For above reasons, they surmised that the role of *Demodex* spp. is supported in pathogenesis¹⁴.

All in all, *Demodex* spp. was detected to be positive in 166 (49.1 percent) of 338 rosacea patients in our study. This rate made us think that *Demodex* spp. plays a substantial role in aetiopathogenesis of rosacea disease. It was found out that this parasite should be considered during the planning of rosacea treatment and rosacea patients should be investigated with respect to *Demodex* spp. as well.

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