

ASSOCIATION OF DEMODICOSIS WITH ACNE ROSACEA

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ABSTRACT

Objectives: *Demodex* spp of humans are encountered frequently all over the world. The role of these parasites is controversial in the causation of skin diseases. This study was carried out to determine the prevalence and the association of *Demodex* spp with acne rosacea.

Methodology: The study was conducted between the years of 2005-2008 in the output clinic of Dermatology and Parasitology Laboratory of Health Research and Training Hospital of Yüzüncü Yıl University. One hundred two patients (patient group) composing of 59 females and 43 males with acne rosacea and randomly selected 50 healthy subjects (control group) were examined for *Demodex* spp. Twenty seven patients were under the age of 35, and 75 patients were aging 35 years old and over. Samples were plucked out from surface of nose and forehead of patients with acne rosacea and healthy subjects by standardized surface skin biopsy (SSSB) method in the Laboratory. The preparations prepared in Hoyer solution were examined under 4X and 10X objectives of light microscope.

Results: The detected parasites were higher in the patient group with acne rosacea (67.65%) than the control group (6%), in females (76.27%) than males (55.81%) and in patients aging 35 years old and over (74.67%) than the patients under 35 years of age (48.15%). Significant relationships were detected between acne rosacea and demodicosis, sex and demodicosis, and age and demodicosis ($p < 0.001$, $p < 0.05$ and $p < 0.05$, respectively).

Conclusion: It was concluded that there is a relationship between the demodicosis and acne rosacea, and dermatologists should take into consideration the *Demodex* spp. in the etiology of acne rosacea.

KEY WORDS: *Demodex* spp., Prevalence, Acne rosacea.

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INTRODUCTION

The hair follicle mites *Demodex folliculorum*, detected in 1841 by Henle and described in 1842

by Simon, and *Demodex brevis*, separated in 1963 by Akbulatova are the most common permanent ectoparasites of man.^{1,2}

Rosacea remains a controversial topic in dermatology, largely because of its uncertain pathophysiology and clinical variation. It has long been debated whether oral and topical antimicrobial agents for rosacea exert their effects by anti-inflammatory or antimicrobial mechanisms. The concept of microbe-induced, follicle-based inflammation in rosacea is controversial. It is unclear whether commensal organisms

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such as *Propionibacterium acnes* and *D. folliculorum*, which reside in hair follicles and sebaceous glands, trigger folliculocentric inflammatory papules in rosacea patients.^{3,4}

Demodex spp. (*D. folliculorum* and *D. brevis*) of human are encountered frequently as cosmopolitan around the world. *D. folliculorum* is usually found in the follicular infundibulum and *D. brevis* in sebaceous and Meibomian glands. *Demodex* spp. is placed often on face, forehead, cheeks, nose, chin, temples, eyelash, ear, nasolabial region, rarely neck, head-haired skin, breast, nipple and genital regions. But the best site to search the mites is the face. The rate of demodicosis in healthy skin is associated with the age, and the frequency of infestation increases with aging. These parasites are absent in children and sparse in adolescents and young adults. The infestation is more severe in middle age and older immunosuppressed humans.^{1,2,4}

The pathogenic role of *Demodex* spp. in humans is still a matter of debate. In the studies performed till now, although some researchers have stated that *Demodex* spp. do not cause diseases, other some researchers have indicated that these parasites cause to acne rosacea, acne vulgaris, seborrheic dermatitis, and blepharitis by contamination of microorganisms, increased number of parasites in follicles and causing dilatation and stopple. Additionally, it has been stated that the parasites cause allergic reactions by penetration of the parasites' antigens to dermal tissues, create the conditions to bacterial dermatitis and make vector of bacteria.^{2,5}

This study was performed to investigate the association between demodicosis and acne rosacea.

METHODOLOGY

The study was conducted between the years of 2005-2008 in the output clinic of Dermatology and Parasitology Laboratory of Health Research and Training Hospital of Yüzüncü Yil University. One hundred two patients (patient group) composing of 59 females and 43 males with acne rosacea and randomly selected 50 healthy subjects (control group) who have not

any dermatological disorders were examined for *Demodex* spp. Twenty seven patients were under the age of 35, and 75 patients were aging 35 years old and over.

Samples were plucked out from surface of nose and forehead of patients with acne rosacea and healthy subjects by standardized surface skin biopsy (SSSB) method in Parasitology Laboratory. Briefly, a drop of cyanoacrylate was dripped on sticky surface of a part of cellophane-tape, and this part was touched on surface of the skin about one minute then removed rather gently. This surface part of the cellophane-tape was touched with Hoyer's solution, a drop was dripped on an object slide and examined with 4X and 10X objectives of a light microscope.

RESULTS

Demodex spp. were encountered in 69 (67.65%) of 102 patients with acne rosacea and three (6%) of 50 healthy subjects. The relationship between acne rosacea and demodicosis was found statistically significant ($p < 0.001$) in patient group when comparing to controls. These parasites were detected in 76.27% of females and 55.81% of males with acne rosacea, and the relationship was statistically significant ($p < 0.05$) between sex and parasite incidence (Table-I). The parasites were encountered in 74.67% of the patients aging 35 years old and over, and in 48.15% of the patients aging under the 35 years old. The relationship was statistically significant ($p < 0.05$) between age and demodicosis incidence (Table-II). It was observed that the application of SSSB method was very easy for the diagnosis of demodicosis, and was appreciated positively by the patients.

DISCUSSION

Demodex spp. of humans are encountered frequently all over the world. The role of these parasites is controversial in the etiology of skin diseases. Some researchers have indicated that these mites constitute the normal flora of skin without causing any diseases,⁶ but some other researchers have reported that the parasite was effective at causing of some skin diseases.^{1,2,7,8}

Table-I: The frequency of *Demodex* spp. according to the sex of the subjects with rosacea.

Sex	Positive		Negative		Total	
	Number-(n)	Percent	Number-(n)	Percent	Number-(n)	Percent
Female	45	76.27	14	23.73	59	57.84
Male	24	55.81	19	44.19	43	42.16
Total	69	67.65	33	32.35	102	100

$$\chi^2 = 4.756, p < 0.05$$

The relationship between some diseases of the skin and *D. folliculorum* has been investigated, but controversial results have been obtained by researches. It has been reported that *D. folliculorum* has been found in 90.22% of patients with papulopustular rosacea,⁹ 88.9% of patients with rosacea,¹⁰ 62.2% of patients with perioral dermatitis,¹¹ and 79.54% of sebum samples taken from nasolabial part of person.¹²

Demodex spp. have been detected in 61.5%,¹³ 59%,¹⁴ 59.6%¹⁵ of patients with rosacea, 11.8%,⁵ 15.4%¹⁶ of patients with acne vulgaris, 28.8%¹⁷ and 56.9%⁵ of patients with blepharitis in studies performed in Turkey. This parasite has been encountered in 67.65% of patients with acne rosacea in our research, and this rate is higher than the results of the researches mentioned above and carried out on subjects with rosacea in Turkey.¹³⁻¹⁵

Demodex spp. are absent in children and sparse in adolescents and young adults, and it has been reported that the frequency of this mites also increases with aging.^{1,2,4,7,13,18} *D. folliculorum* has been found 4% in young subjects, 30% in the age group of 20 to 80, and 47% in older.¹⁸ In a research performed in Turkey,⁶ it has been reported that there was no statistical significance between *Demodex* spp. and age. In another study carried out in Turkey, these parasites have been found in higher rate in group of 20 years old and over than the

group of under 20, and the difference between both groups has been found statistically significant.¹³ In our study, these parasites were encountered 48.15% in the age group of under 35, and 74.67% in the age group of 35 and over, and the difference between the frequency of demodicosis and age has been found statistically significant in subjects with acne rosacea. This result is similar to results of the studies performed around the world and in Turkey except one study.⁶ The reason why a significant relationship was not observed between *Demodex* spp. and age in the research performed by Baysal et al.⁶ might be the young age of subjects (26-30 years old) used in the study.

The different results have been detected between *Demodex* spp. and sex in the researches. Although the incidence of these parasites was not related to sex in some studies,^{13,19} in one research,²⁰ it has been reported that males were more heavily infested than females with *Demodex* spp. In our research, these parasites were encountered in greater number in females than males with acne rosacea, and the relationship was statistically significant between *Demodex* spp. and sex.

D. folliculorum is found often on face, forehead, cheeks, nose, chin, temple, eyelash, ear, nasolabial region, rarely neck, head-haired skin, breast, nipple and genital regions. The best site of the body is the face for search of mites.^{1,2,4,7}

Table-II: The frequency of *Demodex* spp. according to the ages of the subjects with rosacea.

Age Groups	Positive cases		Negative cases		Total	
	Number-(n)	Percent	Number-(n)	Percent	Number-(n)	Percent
≤35 years	13	48.15	14	51.85	27	26.47
≥35 years	56	74.67	19	25.33	75	73.53
Total	69	67.65	33	32.35	102	100

$$\chi^2 = 6.379, p < 0.05$$

Therefore, the samples were taken from the forehead and nose in our study for encountering easily to the parasites, and it was observed that the parasites were easily detected in the samples obtained from these regions in our study.

It was reported that *Demodex* spp. may be obtained from skin by the methods of SSSB, skin scratching, cellophane-tape and punch biopsy.^{6,13-16} The parasites in surface of skin were only obtained with the skin scratching and the cellophane-tape methods, and a small area of skin can be examined with punch biopsy method, therefore, these three methods were not performed in our study. We also observed that the parasites cut into pieces by the skin scratching method, and no patient positively approached to this method. Moreover, we obtained samples easily by SSSB method, and the parasites were encountered in high probability by this method. Additionally, the patients had positive approach to this method in our study.

It was concluded that there is a relationship between the demodicosis and acne rosacea. Therefore, dermatologists should take into consideration *Demodex* spp. in the etiology of acne rosacea.

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