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RESEARCH NOTE

# *Demodex* mite infestation in patients with and without rheumatoid arthritis

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## Abstract

In the present study we compared the prevalence of *Demodex* mites in patients with rheumatoid arthritis and in one control group involving individuals of similar mean age. From each person we epilated 3–4 lashes from each eyelid and examined them under a microscope to find *Demodex* mites. In total 147 patients were examined. The prevalence of *Demodex* mites was 33% in rheumatoid arthritis (RA) patients and 31% in the control group. Our results demonstrated that the prevalence of *Demodex* mites was similar in RA patients as compared to the control group.

## Keywords

*Demodex*, mites, rheumatoid arthritis

Two species known to infest humans are *Demodex folliculorum* and *Demodex brevis*. These parasites are found in the follicular infundibulum (*D. folliculorum*), and sebaceous or meibomian glands (*D. brevis*). *D. folliculorum* is more common than *D. brevis*, and it is characterized by a larger size – about 300–350 µm long and 40–50 µm wide, whereas *D. brevis* is 200–230 µm long (Desch and Nutting 1972). The life cycle takes approximately 3–4 weeks from ovum, larva, protonymph, nymph to the adult form.

*Demodex* mites have been reported in blepharitis (Czepita *et al*. 2005), rosacea (Bonnar *et al*. 1993) and in immunosuppressed patients with AIDS (Ashack *et al*.1989, Jansen *et al*. 2001). The infestation may occur in both forms, symptomatic and asymptomatic (Humiczewska *et al*. 1994). The presence of *Demodex* mites on the skin of children is uncommon. *Demodex* mites were reported in immunosuppressed children especially with acute lymphoblastic leukemia (ALL) (Ivy *et al*. 1995, Damian and Rogers 2003, Herron *et al*. 2005).

Rheumatoid arthritis (RA) is a highly disabling inflammatory arthropathy. RA is the most common chronic, autoimmune and inflammatory disease of the synovium that touches 1.5% of the population. It is not only disease of the joints. It is also characterized by a number of extra-articular effects, including malaise, fever, weight loss, lymphadenopathy, hepatosplenomegaly, and abnormalities of the skin (i.e., rheumatoid nodules, vasculitis, and chronic leg ulcers), nerves (i.e., carpal tunnel syndrome and peripheral neuropathy), eyes (i.e., episcleritis and keratoconjuctivitis sicca), and chest (i.e., pericarditis, pleural effusion and chest infection). The disease is also associated with blood abnormalities such as anemia, neutropenia and hypergammaglobulinemia. There is evidence of an increased risk of serious infections in RA patients treated with anti-TNF blockers (Lipsky *et al*. 2000, Bovenschen *et al*. 2006).

For *Demodex* mite presence, 147 patients from 21 to 87-year old were examined. Individuals were divided into 2 groups. First control group included 75 persons without any immunosuppressive disease (mean age: 61 years; 27 men and 48 women). Individuals classified into the second group were patients of the Rheumatology Institute in Warsaw, Poland. In this group 72 individuals were examined (mean age 61 years; 12 men and 60 women). Each patient was examined by epilation of 3 eyelashes from each eyelid. The eyelashes were put on the slide with drop of Hoyer medium; the medium was made of 50 $cm^3$ distilled water, 30 g arabic gum, 200 g chloral hydrate and 20 g glycerine, and covered with a cover slip. The samples were studied under a light microscope. A positive result was recorded if any larval forms, adult, or eggs of *Demodex* mites were found in the specimen.The prevalence of *Demodex* sp. is shown in Table I.

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**Table I.** The prevalence of *Demodex* sp. mite infestation in control group and in rheumatoid arthritis (RA) patients

| Groups | No. of examined persons | Mean age (years) | No. of infested persons | % of infested persons |
|---|---|---|---|---|
| Group 1 (control) | 75 | 61 | 23 | 31 |
| Group 2 (RA patients) | 72 | 61 | 24 | 33 |

There was no statistically significant difference in *Demodex* mite presence between first and second group ($p = 0.98$).

The highest intensity of infection in control group was 16 *Demodex* specimens and 3 eggs in one sample from 70-year old man. In RA patients the highest number of *Demodex* mites was 18 specimens and 7 eggs (57-year old man).

We compared our results with the results obtained by Ihsan *et al*. (2007). Two different techniques were used to detect *Demodex* mites. In that study standardized skin surface biopsy (SSSB) was used to find *Demodex* on a patient's skin. In our study we epilated eyelashes to find mites. We have chosen this method because ocular symptoms are frequent in RA patients. In our study infestation in RA group was 33% and in control was 31%. In Turkey similar study was carried out by Ihsan *et al*. (2007), and infestation in RA group was 12%, and 18% in control group. Despite the fact that the percentage of infested individuals is higher in our study, the results demonstrated the same trend; in controls and among RA patients *Demodex* mite infestation was at the similar level. Our earlier studies showed that *Demodex* mite infestation in population in Poland is higher than in Turkey – 26% of healthy individuals (mean age 60 years) were infested (Garbacewicz *et al*. 2010).

In two examined groups no difference in *Demodex* mite infestation was reported. Frequent ocular changes were observed in RA patients who often complained of a "dry eye" or a "red eye". Changes such as redness of eyelids are one of the symptoms that patients infested with *Demodex* mites frequently complain about. But there were no statistically significant differences in infestation in both groups; control – 31%, and RA patients – 33%. The intensity of infection was similar in both groups.

This study shows that the prevalence and intensity of *Demodex* mite infestation are similar in RA patients and in patients without immunosuppressive diseases. More frequent ocular manifestation in RA patients has no influence on risk of *Demodex* mite infestation.

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