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Case Report

Laboratory Evidence of the Presence of *Demodex* in Urine Laboratory: A Case Report

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Abstract

Folliculorum mites (*Demodex folliculorum*, and *D. brevis*) are part of the common external parasites in humans as the exclusive host of them. The highest focus of these mites is on those parts of the body that have fat glands and fatty products in the skin. This is proven by the dermal – epidermal separation method. In the present study, the presence of *Demodex* is reported in a urine sample containing hematuria, which has not been observed so far according to the previous investigations. The case was related to a 44-yr-old woman with symptoms of headache, chills, and joint pain referring to the medical diagnostic laboratory of Sanandaj, Kurdistan Province, northwest of Iran. After historiography and collecting the urine sample as middle, the live parasite of *Demodex* was observed. The presence or migration of mite in the atypical areas of the body (genital, urinary, eye, etc.), which are close to hairy tissues (especially in women), may be one of the causes of allergic reactions and clinical symptoms in people.

Introduction

Hair follicles mites, (*Demodex folliculorum* and *D. brevis*), are part of the common external parasites in humans and human beings are their exclusive host. *D. follicorum* was identified in 1841 by Henle and its first isolation was done by Simon (1). After that, *D. brevis*, nowadays known as a separate species, was isolated (2).

So far, 65 species of *Demodex* along with its geographical distribution and their specific hosts have been identified, of which 10 are pathogenic parasites which have been observed in numerous hosts such as humans, horses, goats, cattle, sheep, pigs, and cats (3). Two species of Demodex, found in humans, are *D. folliculorum* and *D. brevis* from the Demodicidae family and of the Cheyletidae super family of the Acari branch (4).

The hair follicles mites are spindle-shaped, and their surface is without hair and colorless. The length of these parasites is between 0.3 to 0.4 mm and they have four pairs of legs in the anterior part of the body, while the posterior part of their body has secondary striations. Their genital area is located in the back of the anterior part of the body. Motility of mites is limited due to short legs (only 8 to 16 centimeters per hour). In all stages of growth, they do not react to light and brightness. They also have a slight resistance to heat and dryness (4).

Although *D. folliculorum* and *D. brevis* are very similar, but according to the following itmes, it is easy to distinguish between these two species (2, 5):

1. In all stages of growth *D. folliculorum* is bigger than *D. brevis* in size (2, 5).
2. The back part of the body of *D. folliculorum* has a round and crescent shape, while in *D. brevis* it is sharp (2, 5).
3. In *D. folliculorum*, the ratio of the posterior part of the body (tail) to the rest of the body is 7/10, while this ratio is 1/2 to 1/3 in *D. brevis* (2, 5).

Most scholars in this field agree that the most commonly seen area of *Demodex* is facial hair, including nose, eyelids, etc. and it is rarely seen in the rest of the body. Stokes and Beerman separated *Demodex* from the chest, under the scapula, the arms, and the genital area (6).

In fact, the focus of these mites is on the parts of the body that have fat glands and fatty products in the skin. This is proven by the dermal – epidermal separation method. Perhaps this can confirm the fact that young people or those with lower fat content are less likely to be attacked by *Demodex* (7).

In the present study, the observation of *Demodex* is reported in a urine sample containing hematuria in one patient; evidence which has not been reported so far, according to available scientific literature.

Case report

The urine sample belonged to a 44-year-old woman who referred to the medical diagnostic laboratory of Sanandaj, Kurdistan Province, with symptoms of headache, chills, and joint pain on 09.06.2017. After the biography, conditions for the collection of sterile urine specimen were described to the patient. Approximately 20 ml of random urine sample was collected in the midstream sample. Results of macroscopic, microscopic, and chemical examination of the urine sample are shown in Table 1.

In microscopic examination observing the *Demodex* parasite (with 162 µm in length/ the back part of the body of *Demodex* was sharp) in the patient's urine sedimentation (Fig. 1), the results were immediately communicated to the patient's care system.

Table 1: Macroscopic and microscopic results of urine sample analysis

Macroscopic & Chemical Analysis		*Microscopic Analysis*	
Color	Bloody	WBC	8-10 hpf
Appearance	Turbid	RBC	>50 hpf
Specific Gravity	1.018	Epithelial cells	8-10/lpf
PH	5.0	Bacteria	Few
Protein	Positive (1+)	Mucous	Few
Glucose	Negative	Casts	Negative/lpf
Keton	Negative	Crystals	Negative/lpf
Bilirubin	Negative		
Urobilinogen	Negative		
Nitrite	Negative		
Blood & Hgb	Positive 4+		

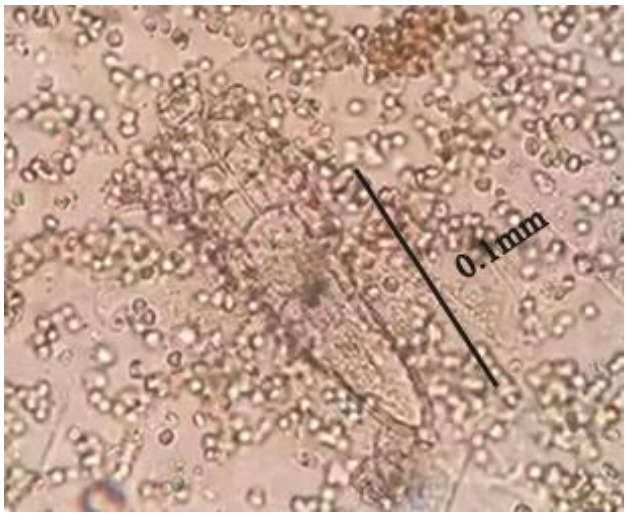

Fig. 1: *Demodex* in the urinary sediment examination (Original)

During the patient's referral, the purpose of the re-sampling was explained to her, and a written consent was taken. The local Ethics Committee approve the study (ethics approval: IR.MUK.REC.1400.124).

The sample for the second urine was collected according to the conditions of the first sample. The urine specimen analysis was repeated again (Table 1), as well as the presence of the parasite were reaffirmed.

Discussion

Based on the existing scientific evidence, although the presence of *Demodex* in the atypical areas of the body is not abnormal, the present study was the first to report *Demodex* in the urine. In previous studies, there have been reports of pathogenicity of these mites. For example, in a study, the presence of *Demodex* and its effects on edema and inflammation of eyelashes was investigated (8). Also, in another study, clinical manifestations of the cornea were reported in eye infections that were caused by *Demodex* (9). The *Demodex* egg in an individual's urine was reported as well (10). In another study, the role of *Demodex* in chronic blepharitis was examined (11).

Based on this report as well as another study (10), attention to the role of *Demodex* in urinary tract infection requires further studies and identification of its inflammatory and

pathogenic mechanisms. Despite this important point, the presence or migration of mite in atypical areas of the body (genital, urinary, ocular, etc.) that are close to the hairy tissues (especially in women) may be one of the causes of allergic reactions and clinical symptoms in individuals.

Further study by researchers and more attention of the medical diagnostic laboratories to reporting such cases can provide an important database to the researcher in this area.

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Conflict of interest

The authors declare that there is no conflict of interests.

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