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TO THE POSSIBLE SPREAD OF SCABIES THROUGH BED LINEN

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Abstract. Acarological examination was conducted of beds and bed linen used by 6 patients who showed clinical symptoms of scabies and in whose skin live scab mites of *Sarcoptes scabiei* species were found by method of lye preparation of skin while collecting skin samples. A total of 411 specimens of mites included in 12 different species was found in the patients' beds by method after Spieksma and Spieksma-Boezeman (1967). In no case, however, the scab mite *Sarcoptes scabiei* was found either in bed or bed linen. After verifying these results in a larger batch of patients the present opinion on the spread of scabies by indirect route, i.e. through contaminated objects, will seem necessary to be revised.

A considerable increase of scabies occurrence has been lately recorded in Czechoslovakia as well as in other European countries (Paličkа et al. 1971; Šrámová and Walter 1972). A detailed analysis of this increase in the mining district of Karviná where we carried out our studies, had been presented earlier (Paličkа and Měrka 1971). In this district the scabies occurrence reached its peak in 1969, when 1212 cases were reported, representing specific infection rate of 419 repeated cases per 100 thousand inhabitants. Despite considerable mass occurrence the epidemiology of this infection still remains vague. One of the most important and least elucidated problems is the route of transmission of the infectious agent (the scab mite or its developmental stages) from one person to another. Because bed and bed linen have been most often mentioned in literature to be the main route of transmission (Heilesen 1946; Franken and Elste 1969 etc.), we made an attempt to shed more light on its role in the epidemiology of scabies.

MATERIAL AND METHODS

A batch of 6 patients with clinical symptoms of scabies was selected. In all cases the clinical diagnostic was confirmed by laboratory findings of live scab mites of *Sarcoptes scabiei* species and their eggs using the method of lye preparation of skin (Ševcová 1971, 1973). No one of these patients was treated for scabies before and on the day of clinical and laboratory examination all received only symptomatic antipruriginosum and were discharged to their homes without any causal antiscabies treatment. The next morning we examined the beds and bed linen used by the patients and only thereafter they were prescribed a proper specifically antiscabies medicine.

The patients' beds were cleaned by a normal vacuum cleaner containing a paper bag in which

the exhausted dust was collected. A 0.5 g portion of dust sample was then processed in laboratory by flotation method after Spieksma et Spicksma-Boczeman 1967, with slight modifications as used in the Institute of Parasitology, Czechoslovak Academy of Sciences in Prague. (The 0.5 g portion is stirred up in 16 ccm of lactic acid, in which it is centrifuged at low revolutions for 5 minutes to avoid 300 g overspeeding. The supernatant is pressed through paper in Büchner funnel, the sediment is stirred up in saturated NaCl solution, centrifuged for 5 min. as mentioned above, the supernatant is filtered again and the whole process is repeated in NaCl twice.) The filter papers were examined under stereoscopic dissecting microscope and the mites found were transferred to microscopic preparations in order to be identified and counted.

RESULTS AND DISCUSSION

In the beds and bed linen used by 6 patients with scabies diagnosis a total of 411 specimens of mites was found, i.e. on the average 68 mites per 1 bed examined. This number demonstrates a sufficient reliability of the method employed. Although 12 mite species were identified (see Table) the species *Sarcoptes scabiei* was not found in a single case. The results make a probable transmission of scabies by indirect route, i.e. through contaminated objects, doubtful because bed linen can be regarded as the most exposed objects to long-term and close contact with human skin and consequently the findings of scab mites in them seem to be most likely. Moreover, the patients who used the beds examined had live scab mites in their skin and the dust collecting from the beds was done in the morning, immediately after the beds had been slept in.

Although we studied this problem on a small batch of patients, the results obtained seem to indicate that indirect transmission of scab mites through contaminated objects, including bed linen, may play a considerably lesser role in the epidemiology of scabies than that ascribed to it before. Our results are supported by findings of Busvine (1966),

Table 1. Occurrence of arthropods in 0.5 g dust samples collected in 6 houses in January 1973

Species or group	Rate of occurrence*)	Total number	Percentage
Dermatophagoides pteronyssinus	100	194	47
Dermatophagoides sp. develop. stages	83	67	16.1
Tyrophagus putrescentiae	50	5	1.2
Acarus siro hyp.	33.3	2	0.4
Glycyphagus domesticus	66.6	9	2.1
Glycyphagus destructor	16.6	4	1
Cheyletus eruditus	50	5	1.2
Gohieria fusca	50	49	12
Chortoglyphus arcuatus	83	71	17.2
Anoetus sp. hyp.	16.6	1	0.2
Tarsonemus sp.	33.3	2	0.4
Pygmephorus sp.	16.6	1	0.2
Proctolaelaps sp.	16.6	1	0.2
Psocoptera	33.3	2	0.4
Coleoptera	16.6	1	0.2
Pediculus capitis	16.6	1	0.2
Total		415	100.0

*) The rate of occurrence is expressed as the percentage of the number of houses in which at least one representative of the species or group of mites was found.

where only 4 out of 300 volunteers contracted scabies by sleeping in a bed left less than 24 hours previously by a patient suffering from scabies. From this view it should be necessary (after verifying our results in a larger batch of patients) to revise the practical methods of epidemic control in the focus of infection, which have so far stressed disinfection of bed linen as the main route of transmission.

As for the other mite species, our list does not differ very much from that given by Voorhorst, Spieksma and Varekamp (1969). In addition our list contains hypopus *Anoetus* sp. which is apparently an accidental finding. Unfortunately, its condition, however, does not allow a precise identification. Some time ago, a similar finding in bed of *Anoetus laboratorium* Hughes, 1950 was reported (Samšiňák and Kasal in litt.).

The heavy occurrence of *Chortoglyphus arcuatus* (Troupeau, 1879) which was detected by Spieksma et al. (1967) in one case (3 specimens) is baffling. Our findings of this species confirm the bad and neglected hygienic conditions of flats in which we carried out our investigations.

Other findings of mites belong to normal fauna of human bed.

К ВОЗМОЖНОМУ РАСПРОСТРАНЕНИЮ ЧЕСОТКИ ПРИ ПОЛЬЗОВАНИИ ПОСТЕЛЬНЫМ БЕЛЬЕМ

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Резюме. Акарологически были обследованы постели и постельное белье 6 больных с клиническими признаками чесотки, у которых во время взятия проб путем метода щелочного препарата кожи одновременно обнаружены в коже живые чесоточные зудни вида *Sarcoptes scabiei*. Путем метода по Spieksma и Spieksma-Boezeman (1967) в постелях больных всего обнаружено 411 экземпляров клещей 12 разных видов. Однако, ни в одном случае в постели или постельном белье не был обнаружен чесоточный клещ *Sarcoptes scabiei*. Можно судить, что после проверки этих результатов на большей группе больных необходимо будет произвести ревизию настоящих взглядов на распространение чесотки непрямым путем, т. е. при соприкосновении с пораженными вещами.

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