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INCIDENCE OF DEMODEX FOLLICULORUM IN NORMAL URBAN POPULATION IN KADUNA (NIGERIA)

V. BOZDĚCH and I. S. MORONFOYE

Institute of Medical Microbiology and Immunology, Charles University, Prague and Ahmadu Bello University, Institute of Health, Zaria

Abstract. The incidence of *Demodex folliculorum* (Simon, 1842) in the normal population in Kaduna was found to be related with the age of the examined persons; the maximum incidence occurred in children aged between 10 and 14 years (10.8 %). No relation was observed between the incidence of parasites and the sex of the patients, but the results differed according to their relation to different ethnical groups respectively.

There have been no reports on the incidence of *Demodex folliculorum* (Simon, 1842) in the sebaceous glands of people living in tropical climate and of Africans. Therefore we studied this problem using the same methods as in our previous examinations of Central European population (Daniel, Bozděch, Moučka 1959). This enabled us to compare the results and to discover the differences in the incidence of *D. folliculorum* in man of the European and African population.

MATERIAL AND METHODS

During the years 1968—1971 we examined 2394 persons (1233 men and 1161 women). The patients came to our institute for general examinations before entering the employment or for preventive examinations during pregnancy. In case they took their children with them, we collected the material also from the children. The content of cutaneous glands on the whole body and limbs and partly on the face was very poor and, with the exception of gland secretion from the nose, naso-labial groove and external auditory canal, contained no mites. The samples were therefore taken only from the nose and its surrounding parts and from the ear-wax. We found that the nose sebaceous glands of the African patients were more developed than those of the Europeans. The content was transferred to the slides and examined under the microscope at low magnification 2—3 hours after collection. If the material was not transparent, it was cleared up with a drop of cedar oil. The preparations with living and moving mites were left in the laboratory at room temperature (30—42 °C) for several days and were observed microscopically as long as they lived.

The examined patients were divided according to their age and sex. In the age-group of 0—9 years there were 131 boys and 159 girls, in the age-group of 10—14 years 38 boys and 45 girls, in the age-group of 15—19 years 286 men and 370 women, in the age-group of 20—29 years 312 men and 493 women and in the age-group of 30 and more years there were 166 men and 94 women.

RESULTS

First of all we studied the question if the incidence of *D. folliculorum* was related to the sex of the examined persons. Table 1 shows the percentage of incidence. Statistical difference between the individual groups was counted according to Reisenauer (1970) using the chi-square test and stated with probability of 0.05 or 0.01. The positivity

in the age-group of 0—9 both of men and women was so low that it could not be statistically compared. In the age-groups of 10—14 and 15—19 we found higher incidence in men (15.8 : 6.7 %, 4.5 : 4.3 %) but the difference was not statistically significant. Highest incidence both in men and women was found in the age-group of 10—14 years. It differed significantly from all other age-groups of men and from the younger age-group of women. In the group of 20—29 years the incidence of parasites was higher in women, but the difference between both sexes (5.3 : 2.6 %) was not statistically significant. When the age-groups of 15 years and older were united, omitting the younger ones, then the incidence was 3.5 % in men and 4.5 % in women. No difference was observed between the age-groups of 15—19, 20—29 and over 30 years. They could be therefore united so that the numbers obtained from a larger group were statistically more significant. However, even this difference between both sexes was statistically not significant; the probability was higher than 0.05 and chi-square equaled 1.0. We could therefore unite them again in one group, regardless of the sex. The incidence of mites, in relation to the age, was then (Tab. 1) very rare in the children younger than 9 years (0.6 %), it reached the maximum rate in the following age-group of 10—14 years (10.8 %) and started to decrease in the age-group of 15—19 years (4.3 %). All these differences between the adjoining groups were statistically significant. Further decrease in the older age-groups (20—29 years—4.2 %, over 30 years—3.3 %) was statistically not significant. As it follows from the Table 1 and from the above data, the numbers obtained even from a large material did not seem to be significantly balanced. We therefore omitted the age-groups younger than 15 years and divided the examined patient according to their tribes. Smaller ethnic groups were not included. We found (Tab. 2) that *D. folliculorum* occurs mostly in the tribe Gudari (9.4 %), lower incidence was found in the tribes Haussa (5.2 %) and Yoruba (2.1 %). The differences between these ethnic groups were statistically significant. The tribe Idoma showed 3.9 % and Koje 5.2 % positivity. However, the differences between the frequency of positivity between these tribes and the other ones were not found to be statistically significant, although more than 170 persons were examined.

Table 1. Incidence of *D. folliculorum* in normal urban population in Kaduna, northern Nigeria. Statistical significance of the differences between the adjoining age-groups and between men and women was detected with the chi-square test. O — Probability higher than 0.05, B — probability 0.05 and lower up to 0.01, A — probability 0.01 and lower.

Age-group	0—9		10—14		15—19		20—29		30 and more
Men									
% of positive findings*)	0.8		15.8		4.5		2.6		3.6
χ^2		3.3		2.2		1.3		0.6	
Probability		A		B		O		O	
Women									
% of positive findings*)	0.6		6.7		4.3		5.3		2.1
χ^2		2.2		0.7		0.6		1.5	
Probability		B		O		O		O	
Total									
% of positive findings*)	0.7		10.8		4.4		4.2		3.3
χ^2	0.2		1.2		0.1		1.8		0.8
Probability	0		0		0		0		0

*) Number of examined patients in the individual groups is given in the text.

Table 2. Incidence of *D. folliculorum* in normal urban population in the age-group of 15 and more years, regardless of the sex of the examined patients, considering the relation to different ethnical groups. O — probability higher than 0.05, B — probability 0.05 or lower, not reaching 0.01, A — probability 0.01 or lower.

Ethnical group	No. of examined persons	% of positive findings	Haussa		Yoruba		Idoma		Koje		Gudari	
			χ^2	Probability	χ^2	Probability	χ^2	Probability	χ^2	Probability	χ^2	Probability
Haussa	463	5.2	0	0								
Yoruba	331	2.5	2.1	B	0	0						
Idoma	180	3.9	0.7	0	0.9	0	0	0				
Koje	171	5.2	0.05	0	1.4	0	0.6	0	0	0		
Gudari	128	9.4	1.6	0	3.0	A	1.5	0	1.1	0	0	0

DISCUSSION

The content of sebaceous glands was collected similarly as in our previous experiment (Daniel, Bozděch, Moučka 1959) only from the skin of face because we usually did not manage to obtain a sufficient amount of humour from other parts of body. Our results are consistent with the records of Henle (1841), Simon (1842), Fanthom et al. (1915), Martini (1952) and Breckenridge (1959). The findings of demodicids in the bald skin on the crown of head (Fortunescu and Ilies 1966) or other parts of body (Riechers and Kopf 1969, Ilies 1969) can be considered as occasional.

The problem of *D. folliculorum* infestation in man and of its pathogenicity has remained unsolved since our previous report. The opinion of Borrella (1949) that *D. folliculorum* participates in the transfer of leprosy has not been supported by any further finding. Ayers and Ayers (1961) and Robinson (1965) agree with the opinion of Miskijan (1951) and assume that *D. folliculorum* participates in the origin of akne rosacea. Breckenridge (1959) gives a more exact histological description. In his opinion demodicids cause the dilatation of follicles, obstruction of normal flow of humour and contribute to the formation of komedons. The infected people do not feel any marked itchiness. These mites seem to infest preferably the skin which has been pathologically changed, rather than to damage it themselves.

In our previous paper (Daniel, Bozděch, Moučka 1959) we reported that *D. folliculorum* survived several months in the sebaceous humoral secretion out of the body of a living organism. In our material collected in Africa they stopped moving and reacting to pH etc. already on the 3rd day. This may be explained by the fact that the mites were kept at higher temperature of the laboratory (up to 42 °C), which caused speedier dessication of the humour.

This may also explain the lower incidence of *D. folliculorum* in African population. In Czechoslovakia the incidence of this mite was found to be three times as high in the age-group of 20—29 years and in the age-group of more than 30 years even ten times as high (17.2 : 5.1 % and 33.5 : 3.1 %). These differences are statistically significant, chi-square being more than 5 or 9. We assume that the higher temperature and the hot sun are unfavourable for the distribution of demodicosis in Kaduna and in the whole Africa and we do not consider the life standard to be of great importance, though larger accumulation of people on a smaller space may also have an influence on the distribution.

In the Central European population the incidence of *Demodex folliculorum* increased with the age of the host (the differences measured between the next age-group but one are statistically significant), while in Kaduna the highest incidence was found in the age-group of 10—14 years and then it decreased with the age (0.6 : 10.8 : 4.4 : 4.2 : 3.3 %; in the Prague population—14 : 17 : 20 : 32 : 43 : 51 %; see Daniel, Bozděch, Moučka 1959). The differences in *D. folliculorum* incidence in different ethnic groups may be explained by their different mode of life.

ВСТРЕЧАЕМОСТЬ КЛЕЩА *DEMODEX FOLLICULORUM* СРЕДИ ОБЫЧНОГО ГОРОДСКОГО НАСЕЛЕНИЯ В Г. КАДУНА (НИГЕРИЯ)

В. Боздех и И. С. Моронфой

Резюме. Установлено, что встречаемость клеща *Demodex folliculorum* (Simon, 1842) среди обычного городского населения в г. Кадуна связана с возрастом обследованных лиц; максимальную встречаемость находили у детей в возрасте 10—14 лет (10,8 %). Никакой связи не наблюдали между встречаемостью паразитов и полом больных, но находили, что результаты различались смотря по принадлежности отдельных лиц к разным племенам.

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V. B., Ústav pro lékařskou mikrobiologii a imunologii, Studničkova 7, Praha 2, ČSSR