E. Rodenwaldt-Archiv 1 (2): 55—63 (1974)

XI Scientific Meeting of the German Speaking Mycological Society in Basel, September 26—28, 1974

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Chronic paronychia in Egypt

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Chronic paronychia is one of the common disorders of the nails, however, its etiology is, still, a matter of controversy. Various bacteria and yeasts were isolated by several authors (Whittle et al., 1959; Martin, 1959; Stone and Mullins, 1964; English and Walsh, 1966; Alteras and Cojocaru, 1967 and Abdel-Fattah et al., 1969). On the other hand, constant exposure to moisture has been incriminated as a predisposing factor (Frain-Bell, 1957; Whittle et al., 1959; Emmons et al., 1963 and Shrank et al., 1965).

In the present work the various aspects of chronic paronychia were investigated in a trial to evaluate the problem as a whole and hence its management.

Material and methods

196 patients suffering from chronic paronychia were examined clinically. Full case histories were reported. Scrapings from the nail folds and nail plates were examined microscopically in 15% KOH solution and culturally on Sabouraud dextrose agar, blood agar and McConkey's agar media; 10 nails were examined histopathologically; the nails were fixed in equal parts of 10% formalin and a solution of 5% trichloroacetic acid for 24 hours according to the method described by Alvarez and Zaias (1967). For embedding, a mixture of polyethylene glycol-pyroxylin was used. The sections were stained by H & E, Van Gieson stain and the P A S stain.

Results

Chronic paronychia was observed in 172 females and 24 males. The disease was most frequent in patients belonging to the age group 21–30 years; less frequent under 20 und rare under 10 years or over 50 years.

The total fingers affected in all patients were 459 (23.4%). The percentage of affection was higher in the right hand (29.6%) than in the left hand (17.2%); however, the different fingers in both hands were nearly equally affected. In general, the middle finger presented the highest percentage of involvement (34.5%); the ring and index fingers had the second and third frequencies in the right and the reverse in the left hand and the little fingers showed the least affection (Table 1).

52.2% of the patients were housewives and the rest had different occupations (Table 2). On examining a random of 20 women with regard to the number of their children, it was found that more fingers were affected in mothers having several children under 10 years, and the rate of affection remained high even when the children became older and they were

Table 1: Frequency of involvement of the different fingers in chronic paronychia

Finger	Number of fingers affected					
	right hand		left hand		Total	%
	No.	%	No.	%		
Thumb	33	11.4	29	17.3	62	13.4
Index	60	20.7	51	30.4	111	24.0
Middle	107	36.8	52	30.9	159	34.5
Ring	80	27.6	26	15.5	106	23.7
Little	11	3.5	10	5.9	21	4.4
Total	291	100 %	168	100 %	459	100 %

Table 2: Occupational incidence

Occupation	No. of patients chronic paronychia
Housewives	122
Female cooks and servants	19
Female workers	15
Male workers	8
Male farmers	7
Female students	9
Male students	5
Soldiers	3
Children	3
Employees (Male)	2
Employees (Female)	2
Infant	1
Total	196

males. On the contrary, the number of fingers affected was much less in patients having daughters over 15 years old (**Table 3**).

Clinical findings

Swelling and retraction of the posterior nail fold was evident in all patients, and in most of the cases it was associated

Table 3: Number of the fingers affected in chronic paronychia in 20 women in relation to the number of their children

Age	Duration of marriage in years	Duration of the disease in years	No. of fingers affected	Total No. of Children	Sex & age of Children					
					0–10 (years)	11–20	21–30	0–10 (years)	11–20	21–30
					Male			Female		
38	22	8	8	7	2	3	1	1	—	—
27	4.5	3	6	2	–	–	–	2	–	–
45	18	1	4	4	–	2	–	2	–	–
25	7	3	4	3	–	–	–	3	–	–
26	7	4	3	2	1	–	–	1	–	–
33	2	1	3	1	–	–	–	1	–	–
22	2	1	3	1	–	–	–	1	–	–
30	5	1	3	1	–	–	–	1	–	–
22	5	2	3	2	1	–	–	1	–	–
24	2	1.5	3	1	–	–	–	1	–	–
21	2	1	3	1	–	–	–	1	–	–
27	4.5	3	3	1	–	–	–	1	–	–
38	19	4	2	5	1	2	–	1	1	–
55	35	14	2	5	–	1	2	–	1	1
40	22	4	2	2	1	–	–	–	1	–
38	21	4	1	4	1	–	–	–	3	–
26	5	3	1	2	1	–	–	1	–	–
45	28	2	1	6	–	3	2	–	–	1
40	20	1.5	1	2	–	–	–	–	2	–
23	2	1	1	1	–	–	–	1	–	–

with changes of the nail plate. Discoloration of the nail plate was the most frequent sign (85.7 %), follow by opacity (66.5 %), transverse furrowing (55 %), thickening (44.3 %), pitting (33.1 %), longitudinal furrowing (25 %), onycholysis (19.3 %) and onychomadesis (11.2 %); see figures 1, 2, 3 and 4.

Mycological and bacteriological findings

Yeasts were isolated on 115 occasions out of 196; in 48 cases alone and in 67 cases they were combined with bacteria and/or moulds. Candida albicans was the most prevailing species (44.3 %), followed by C. parapsilosis (19.1 %), C. tropicalis

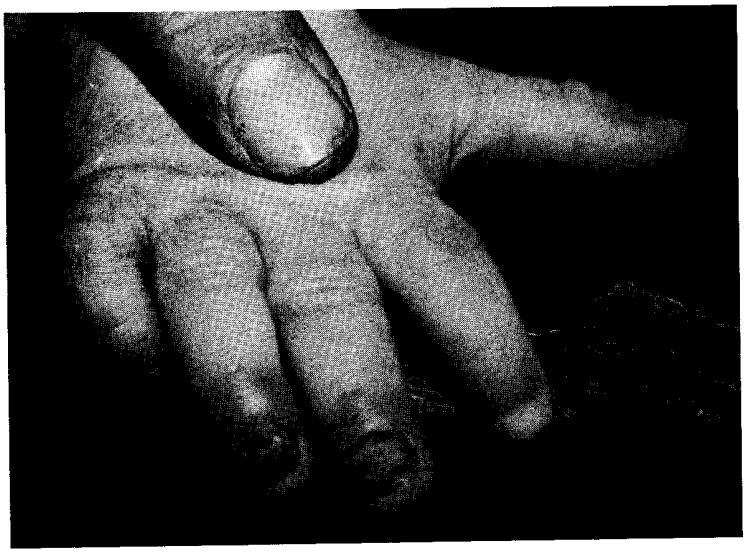

Fig. 1: 14 month old infant showing paronychial changes.
Culture: C. albicans and A. niger.

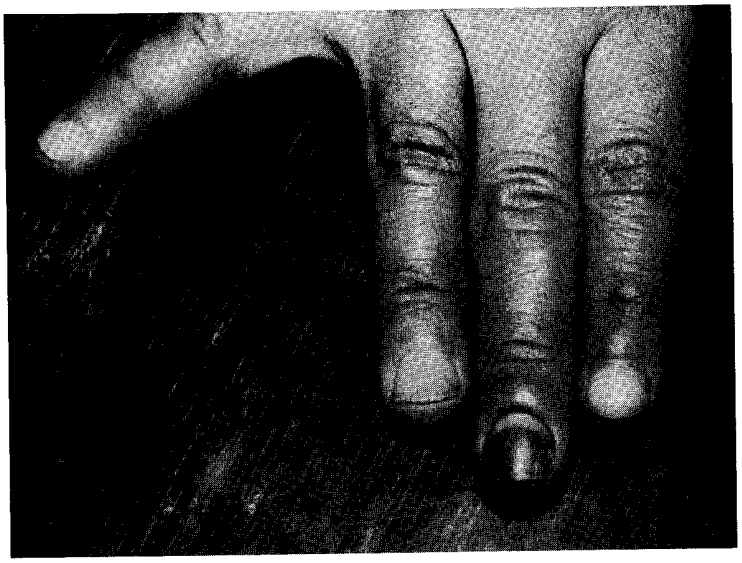

Fig. 2: A middle finger showing rounding out and retraction of the posterior nail fold. The nail plate is stained black with sparing of the lunula.
Culture: Alternaria.

Table 4: Identification of the isolated yeasts

(Yeast)	No. of Isolates	%
A. **Candida**		
albicans	51	44.3
parapsilosis	22	19.1
tropicalis	7	6.1
reukaufii	3	2.6
B. **Torulopsis**		
famata	13	11.3
sake	9	7.8
candida	5	4.4
C. **Trichosporon**		
cutaneum	5	4.4
Total	115	100

(6.1 %) and C. reukaufii (2.6 %) (Table 4). The remaining yeasts belonged to the genera Torulopsis and Trichosporon.

82 strains of moulds were isolated and were identified as Aspergillus (50 strains), Penicillium (17), Hormodendrum (5), Cephalosporium (4), Alternaria (3) and Stemphylium (1).

The isolated bacteria were 93 Staphylococcus-strains (87 coagulase negative and 6 coagulase positive), 6 Escherichia coli and one strain of Pseudomonas aeruginosa.

Histopathological findings

Histopathological examination of the nail plates revealed the presence of dis-

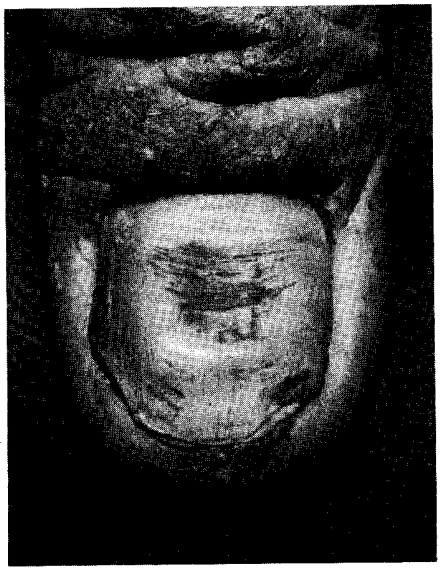

Fig. 3: Transverse furrowing and pitting. Culture: C. parapsilosis.

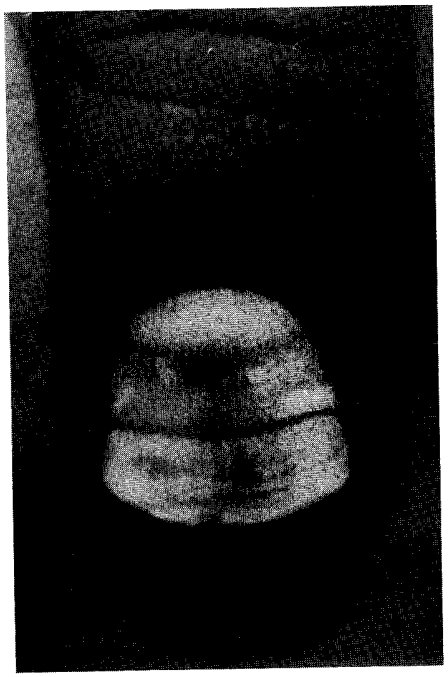

Fig. 4: A finger nail showing onycholysis.

integration, thining, cleft formation and parakeratosis. The nail bed changes were hyperplasia in the epidermis, the dermis presented cellular infiltration, patches of irregular fibrosis and thick-walled blood vessels **(Fig. 5 & 6).**

Discussion

The prevalence of the disease in females seems to be of occupational nature as most of them were housewives. The high incidence among housewives was also noticed by Blaschke-Hellmessen (1968) and Abdel-Fattah et al. (1969). The house work constitutes the predisposing factors mentioned by different authors, namely chemical and mechanical trauma as well as continuous exposure to moisture. Samman (1966) stated that chronic paronychia is a disease of women who have their hands constantly in water. Abdallah (1973) mentioned that trauma of mild continuous mechanical nature as well as maceration of the skin by detergents and alkalies are more important predisposing factors. In the present work other occupations were also involved e.g. cooks, servants and industrial workers; however, the work of all these persons is more or less similar to that of the housewives.

The higher rate of affection of the fingers of the right hand than that of the left hand is an expected result as the right hand is involved more in the work and consequently it is more prone to trauma. The middle, ring and index fingers are the site os friction especially in washing clothes; the middle finger being the longest is subjected more to trauma and hence it presented the highest rate of affection. On the other hand, the little finger showed the least affection as it is less subjected to trauma because its role in manual work is overtaken by the other fingers.

Although chronic paronychia is one of the common disorders of the nail, there is no universal agreement about its cause. Walter (1965) described the pathogenesis of the disease as the invasion of macerated and injured posterior nail fold by microorganisms among which Candida albicans is important as well as certain bacteria. In the present work yeasts were isolated from 115 cases and Candida albicans was the most frequent (44.3 %). Also in other countries C. albicans was frequently isolated from cases of chronic paronychia (Frain-Bell, 1957; Whittle et al., 1959; Martin, 1959 and Stefanović and

KRSTIĆ, 1967). The high incidence of C. parapsilosis had been noted by REIERSOLE in 1962 who isolated it from 21 out of 40 patients. In this study C. parapsilosis constituted 19.1 % of the yeasts isolated.

From these results, the frequent association of yeasts especially of the genus Candida with chronic paronychia is well evident, however, their etiological role was always a matter of discussion. WHITTLE and GRESHAM (1963) could reproduce the disease experimentally using viable Candida cells. STONE and MULLINS (1964 and 1965) succeeded in reproducing the disease not only by viable C. albicans cells but also by occluding non-viable cells in relatively sterile nail fold. They claimed that a cellular material derived from the dead cells penetrated into the deeper structures and produced a chronic inflammatory reaction, the infiltrate of

Fig. 5: The epidermis of a nail-bed showing acanthosis with focal hyperplasia.

Fig. 6: The dermis of the nail-bed showing marked thickening of the wall of blood vessel and narrowing of its lumen.

which is the major factor in the rounding out and retraction of the posterior nail fold.

Moulds were isolated alone in 14 cases and in association with yeasts and/or bacteria in 32 cases. In all the 14 cases there was blackening of the nail plate in addition to the retraction and swelling of the posterior nail fold. Cases of black nails caused by moulds were described by other authors (Schnapka, 1955; Gip and Paldrok, 1967), but we came across with no reports on moulds as a causative agents of chronic paronychia in the available literature. The cases of black nails encountered in this work presented in addition swelling and retraction of the nail folds. It may be claimed that moulds acted as foreign material gaining access through the macerated posterior nail fold and excite an inflammatory reaction. This interpretation is based on the theory initiated by Stone and Mullins in 1964 about the role of foreign materials as a cause of rounding out and retraction of the nail fold.

The bacteria isolated in this study are mostly non pathogenic. Although the number of coagulase positive cocci was relatively small yet their role in chronic paronychia cannot be ignored. The may provoke chronic paronychial changes on top of acute paronychia caused by them.

On the basis of the histopathological findings it can be concluded that, in chronic paronychia the inflammatory process seems to start in the proximal nail fold which appeared clinically rounded and retracted; the process extended subsequently to the nail matrix which in turn reacted by acanthosis and parakeratosis of its epidermal cells; the parakeratosis

led to the formation of the clinically observed pits. In more advanced cases dermal patchy irregular fibrosis as well as thickening of the dermal blood vessels of the bed took place. In this stage, dystrophic nail plate changes occurred e.g. onycholysis, onychomadesis etc.

Summary

The fingers of 196 patients suffering from chronic paronychia were examined clinically, mycologically and in part also histopathologically. Chronic paronychia was found to be common in females, especially housewives. The total fingers affected were 459 (23.4%); the rate of affection was higher in the right hand, especially in the middle, ring and index fingers. The different clinical changes of the nail plate were described. Cultures yielded yeasts, moulds and bacteria. The yeasts commonly isolated were Candida albicans, C. parapsilosis and C. tropicalis. The moulds were Aspergillus, Hormodendrum, Cephalosporium, Alternaria and Stemphylium. Most of the bacteria were coagulase negative Staphylococcus. Histopathologically, the nail plates showed disintegration, thining, cleft formation and parakeratosis. The nail bed changes showed hyperplasia in the epidermis and celluar infiltration, fibrosis and thickening of the walls of blood vessels in the dermis.

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