The Isolation, Identification and Treatment of the Causal Agents of Chronic Paronychia in House Wives.

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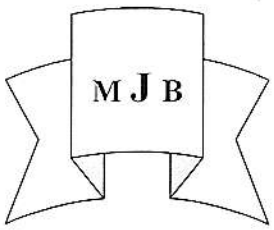


Abstract

A total of 228 finger specimens were collected from a hundred patients suffering from chronic paronychia (C.P). The causal agents were isolated in pure form using different types of diagnostic culture media (Sabouraud's dextrose agar, blood agar, Eosin Methylene Blue agar, and Kligler iron agar slop and butt). They were fully identified by using colonial morphology, germ tube formation test, chlamydospore formation test, and fermentation of different types of sugars.

Candida species were isolated from 164 nail folds (72%), while (95.6%) were *gram-negative bacilli* and (96.6%) were *gram-positive cocci*. The multiple infections (Candida + *gram-positive cocci* + *gram-negative bacilli*) occur in 92 (40.4%) nail folds. The isolates were fully identified bacteriologicaly.

The oral carriage of *Candida species* was (36%); this indicates that oral contamination of the hands with *Candida species* is the most common cause of C.P.

The most prevalent isolated species of *Candida* in C.P. was *C.albicans* 62 (45.3%) out of 137, *C.tropicalis* 53 (38.7%), *C.kefyre* 21 (15.3%) and *C.gullieromondii* 1 (0.7%). There was a significantly difference between *C.albicans, C.kefyre* and *C.gullieromondii* ;($P < 0.01$) .But there was no significant .

The right hand was involved with chronic paronychia in62% of 100 cases .The next were both hands (25%), and the left hand (8%) .The feet were only involved in 5% of the total cases.

87% of patients were treated with topical 1%clotrimazole cream + combination of antibiotic + steroid (steroid was stopped after one week of treatment). Intramuscular Injection of triamcenolon acetenoid (2.5mg/ml) in addition to the above treatment was given to 17 patients with very severe swollen and multiple fingers involvement. The majority of the patients 47 (51%) gave good response and complete recovery within 60 days, however some patients, 25(28.7%) (includes those who received intramuscular injection of steroid) were recovered earlier within 40 days, but only 15(17.2%) of the patients need longer period for recovery (80days). The difference is statistically significant between the response within 60 days in comparison to those recovered within 40 days or 80 days respectively; ($P<0.01$).

الخلاصة

بمجموع 228 مسحة إصبعية قد جمعت من مائة مريضة تعانى من مرض الداحوس المزمن.عزل العامل المسبب بتقاوة باستعمال أنواع مختلفة من الأوساط الزرعية التشخيصية مثل (Sabouraud's dextrose agar-blood agar-Eosin Methylen blue agar and Kligler iron agar slop and butt) كلها حددت كاملة باستعمال : شكل المستعمرة، فحص الانبوب الجرثومي، فحص البوغ الحرشفي، وتعفن الانواع المختلفة من السكريات.

انواع المبيضات تم عزلها من 164 طية اظفرية (72%) . بينما (95.6%) كانت من سلبي لغرام (grams- negative bacilli) و (96.6%) من ايجابي لغرام (grams positive cocci) الخمج المتعدد (انواع المبيضات+انواع ايجابي لغرام+انواع سلبي لغرام) حدث في 92 أصبع (40.5%)، علما ان جميع العزل تم تحديدها حسب ما موجود في علم البكتريا.

ان اعظم نسبة انتشار لانواع المبيضات كانت بين الفئة العمرية (35 – 54) سنة 84 (36.8%)، اختلاف التباين الاحصائي عال ومهم بالمقارنة الى بقية الفئات العمرية، (p<0.01). يليه الفئة (15–34) سنة 60 (26.4%) وأخيرا (54–70) سنة 20 (8,8%). لا يوجد تباين احصائي بين هذه الفئات العمرية (15 – 34) و (35 – 54) حيث ان (p>0.05).

ان الحمل الفموي لانواع المبيضات كان 36% مما يدل على ان التلوث الفموي لليدين بانواع المبيضات هو سبب مهم للاصابة بمرض الداحوس المزمن.

اعظم المبيضات انتشارا: المبيضات البيضاء (C. albicans) 62 (45.3%) ، المبيضات الاستوائية (C. tropicals) 53 (38.7%)، مبيضات كفير (C. kefyre) 21 (15.3%) ومبيضات كاليرومندي (C. gullieromordii) 1 (0.7%) . يوجد تباين احصائي بين المبيضات البيضاء، مبيضات كفير ومبيضات كاليرومندي (p<0.01) ولا يوجد اختلاف مفيد بين المبيضات–البيضاء والاستوائية (p>0.05).

وكانت اليد اليمنى مصابة بمرض الداحوس المزمن بنسبة (62%) من مجموع مئة حالة. وبعدها اصابة اليدين بنسبة (25%) واليد اليسرى بنسبة (8%) . القدمين اصيبت بفقط (5%) من مجموع الحالات.

(87%) من المريضات تم معالجتهن بواسطة المسح الموضعي لـ كلوترايمزول اضافة الى مزيج المضاد الحيوي مع الستيرويد (علما ان الستيرويد يوقف بعد اسبوع من بدء العلاج). تم زرق الـ تراي أمسينيلون استينويد (Triamcenolon acetenoid) (2.5 ملغم لكل مل) لـ 17 مريضة (اضافة الى العلاج اعلاه) وبالذات الحالات المصحوبة بالورم والالتهاب الشديد وتعدد الاصابع المصابة.

معظم المريضات 47 (51%) استجبن لعلاج وتم الشفاء بصورة تامة ضمن 60 يوم مع ذلك قسم منهن 25 (28.7%) (ومن ضمنهن اللواتي اعطين الحقن العضلية للسيترويد) اكتسبن الشفاء مبكرا وضمن 40 يوم لكن فقط 15 (17.2%) احتجن لفترة اطول للشفاء التام (80 يوم). التباين الاحصائي مهم بين اللواتي استجبن ضمن 60 يوما بالمقارنة الى اللواتي استجبن ضمن 40 يوما أو 80 يوما بالتعاقب (P<0.01).

Introduction

Chronic paronychia (c.p) is defined as a localized pyogenic infection of the skin folds surrounding the fingers nail. It is one of the most common dermatological infections of the hands. [1], occurring in about 60% of patients suffering from superficial dermatomycosis [2]. It causes a considerable pain, discomfort and suffering to the patients, and is often missed diagnosed by the general practioners [3]. In developed countries there was a considerable amount of research work had been performed in a chronic paronychia, but there are debates on its true etiological agents and the most common predisposing factors that contribute to chronic paronychia especially among house wives. [4].

The isolation and identification of the true causal agent is very essential to confirm the diagnosis of (C.P), to find effective treatment [5,6].

The aim of this study is to isolate and identify the etiological agents of chronic paronychia among house wives and examine the therapeutic value of topical 1%clotrimazole plus combination of (antibiotic like gentamycin o cliquinol) plus steroid. Single intramuscular injection of triamcenolon (only used when there is sever, multiple fingers involvement).

Patients and Methods

Two hundred twenty eight swabs had been collected from a hundred patients; their ages ranged from 17-70 years with a mean of 39.5± 11.11. 89% of them were married and most of them had children whose numbers ranged from 1-14 with a mean of 5, during the period from one 2001 to the end of April 2002 in the privet clinic and out-patient of gynecological clinic. These patients having inflammation of the nail fold for more than six weeks, and showing typical clinical picture of chronic paronychia ,with varying degrees of ballooning of nail folds, redness and tenderness to pressure; occasionally a small amount of pus appear on pressing the nail fold. None of them were on

antibiotics or fungicides, six had atopic dermatitis and two are diabetics.

The skin lesion of suspected cases of C.P. is disinfected with 70% ethyl alcohol, with sterile cotton swab socked in brain heart infusion broth (B.H.I.B) is introduced gently in the swollen space between the finger nail fold and the nail. Then with a gentile screw-like movement of the swabs small amount of the pus is obtained. The swabs aerobically dipped in test-tube containing (B.H.I.B) and incubated at 35C◦ for (1-3days) or for several days until there is visible growth. Then inoculation with sterile loop was performed from the visible growth on (B.H.I.B) or the following culture media. Blood agar (B.A), manitol salt agar (M.S.A), Eosin methylene blue agar (E.M.B) and Kligler Iron slop (K.S) and incubated at 35C◦ for (1-2days). The inoculated plates were examined carefully for visible colonies by hand lens and the isolated agents were identified using several biochemical tests (according to Mac fadian method 2000) the results were noted. As for the isolation and identification of Candida species inoculation was performed from (B.H.I.B) on Sabouraud's` dextrose agar (S.D.A) contain chloramphenicol 16Ug/ml.and penicillin 2o IU/ml, and incubated for 1-3days and there for (4-10days) for visible growth. The suspected colonies of Candida species were identified using germ-tube formation test with human serum incubated for 2-5hours together with Microscopical examination for pseudohyphae and chlamydospos formation test using high power objective lens, test for the fermentation of different sugars were also performed using Chang and Bannet method [7]. The results were recorded and the data were analyzed used chi-square test.

The following regimen of treatment were used for 40,60,80days.Topical application of 1% clotrimazole cream+ clioquinol 30mg/Kg.+flumethazone 0.2mg/Kg for one week and then continued with a combination of clotrimazole + gentamycin 0.3mg/ Kg.

Results

Table 1 The number and percentage of different species of Candida, identified

The type of Candida species	**Number**	**Percentage**
C. albicans	62	45.3
C. tropicalis	53	38.7
C. kefyre	21	15.3
C. gullieromondii	1	0.7
Total	137	100

Table 1 shows the number and percentage of different *Candidal species* that had been identified from 137 cases of chronic paronychia. 62 out of 137 (45.3%) were *Candida albicans* and 53 (38.7%) *Candida tropicalis*, in comparison to 21 (15.3%) of *Candida kefyre*, only from one case of *Candida gullieromondii* was isolated. Statistical analysis of these data is given a significant difference between *C.albicans, C.kefyre* and *C.gullieromondii*, ($P< 0.01$). But there is no significant difference between *C.albicans* and *C.tropicalis*; ($P < 0.05$).

The oral carriage of *Candida species* was investigated to find out its source of C.P. infection. Thirty six out of 100 oral

swabs were examined, giving positive results (36%) which proves to be statistically significant in 95 % confidence interval ,that the true population (C.P.) lies with these values (0.31-0.41). i.e. 31-41%.

Table 2 The number and percentage of Staphylococcus, Streptococcus and Candida species.

The microorganism	Number	Percentage from 220
S. aureus	129	58.6
S. epidermidis	77	35.0
Strep. Pyogens	14	6.3
Candida species	164	72

Table 2 shows the number and percentage of genus and species of gram positive cocci in comparison to *Candida species*. High percentage of *staphylococcus aureus* (58.6%) in comparison *to staphylococcus epidermidis* (35%) however very few *Streptococcus pyogens* were isolated (6.3%), in comparison to 72% *of Candida species* from cases of C.P .There was a statistical difference between *S.aureus,S.epidermidis* and *S.pyogens* ;($P<0.01$).

Table 3 The number and percentage of grams –Ve bacilli isolated from cases of C.P., with and without mixed infection.

Type of microorganism	Number	Percentage
Proteus species	44	20.1
Pseudomonas aeruginosa	23	10.6
E. Coli	22	10.1
E. coli + proteus	90	41.3
E. coli + Pseudomonas aeruginosa	15	6.9
Pseudomonas aeruginosa + proteus species	24	11.0
Total	218	100

Table 3 shows the number and percentage of grams negative- bacilli and mixed infection of C.P...Out 218 nail folds infected with gram- negative bacilli; mixed *E.colli* and *Proteus species* were recorded, 90 (41.3%). In comparison to *Proteus species* 44 (20.1%) in which there was a statistical difference among them; ($P < 0.001$), while mixed *E.colli + Ps.aeruginosa* was 15 (6.9%) in comparison to *Ps. aeruginosa* alone 23 (10.6%) in which there was no statistical difference among them; ($P > 0.05$).

Table 4 The number and percentage of the hand and foot involvement

Type of hand	Number
Right hand	62
Left hand	8
Right hand + left hand	25
Foot	5
Total	100

Table 4 shows the percentage of infection in right-handed patient in comparison to left handed together with foot infection. High percentage (62%) of patients examined were right-handed in comparison to (8%) who were left-handed is highly significant; ($P<0.01$). However infection of feet was (5%) in comparison to both hands (25%), the statistical difference is highly significant; ($P<0.01$).

Table 5 The number, frequency and the type of the fingers affected by chronic paronychia

Type of finger	Number	**Percentage from 217 cases**
1- Rt. Thumb	48	22.1
2- Rt. Middle	37	17
3- Rt. Ring	29	13.3
4- Rt. Index	25	11.5
5- L. middle	17	7.8
6- L. thumb	16	7.4
7- L. index	12	5.5
8- L. ring	10	4.6
9- Rt. Little	6	2.8
10- L. little	5	2.3

Rt. Right, L. Left

Table 5 shows the number, frequency and the type of affected fingers with exclusion of toes. Chronic paronychia was more common on the right fingers than on the left fingers in which there is a significant statistical difference between them; ($P < 0.01$). The most commonly affected fingers were; the right {thumb (22%), middle (17%), ring(13.3%), and index (11.5%)} finger and left middle finger (7.8%), a difference was not statistically significant.

But combination of two or three fingers affected by C.P. was also seen, especially the right (thumb middle + ring fingers) and left (thumb middle fingers).

Clinical examinations revealed that; 49% of the cases of C.P. showed acute exacerbation during the cold months, while those who gave a history of preceding acute paronychia and trauma were 8%, and 9% respectively. Pus discharge was recorded in 51 (22.4%) , riddges in 70 (30.7%), roughness 50 (21.9%), dystrophy and onycholysis in 28 (8%) of the cases as well as there was a decrease in the size of the nail seen in 21% of the cases.

Patients suffering from hand dermatitis was recorded in (28%), and erosiointerdigital blastomycetica in (9%) as well as those having chronic paronychia.

Table 6 The number and percentage of the patients response to treatment during different times.

Time in days	Number of patients	Percentage
40	25	28.7
60	47	51
80	15	17.2

Table 6 shows the number and percentage of the patient's responsiveness to our regimen of treatment. Complete improvement was shown within 40-80 days. The majority of the patients (51%) gave good response with complete recovery with in 60 days, however some patients (28.7%) were recovered earlier with in 40 days, but those (17.2%) were recovered after long period of treatment (with in 80days), those who were given intramuscular injection of steroid were recorded within 40days.

The difference is statistically significant between the response with in 60days in comparison to those recovered with in 40 or 80 days respectively; ($P < 0.01$).Figure (1), (2); shows the clinical picture of the patient before and after treatment respectively.

Figure 1 before treatment

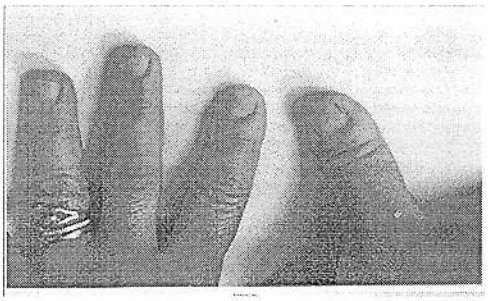
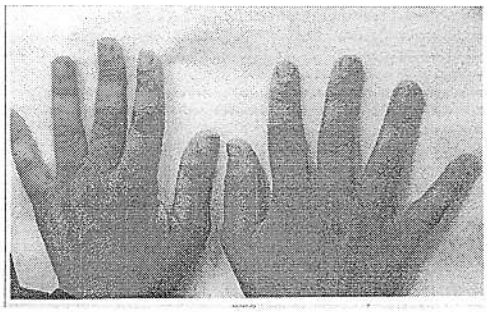


Figure 2 after treatment



Discussion

Chronic paronychia is one of the commonest specific nail complaints met with in dermatological practice [3]. The common age of the affected patient is between 30 and 60 . The domestic work of housewives is the most common occupation that contributes to chronic paronychia, ,in which 88% of them were housewives (this probably is due to frequent mechanical trauma from hand-washing of clothes and washing dishes using alkaline solutions (soap and water) that lead to maceration of skin and predisposition to fungal and bacterial infections) [8]. While in 1988;E. Sharquie and Al-omran were founded that C.P. was accounted for 33.3% of occupational housewives dermatosis cases, as well as Hellier[9], [10], Whittle, et al, (1955), [11] were founded in their studies that most patients with C.P. were housewives or domestic workers.

The *species of Candida* that had been isolated from our patients were reported in table (1); 62 out of 137 (45.3%) were *C.albicans*, nearly similar percentage; 53 out of 137 (38.7%) were *C.tropicalis*, however only one isolate was *C.goillieromondii* and 21 out of 137 (15.3%) *C.kefyre*. The difference is statistically significant between both C.albicans and *C.tropicalis* in comparison to *C.kefyre*; ($P<0.01$). At any rate, there is no statistical difference between frequency of *C.albicans* and *C.tropicalis*; ($P> 0.05$). These trends of results indicate the more frequent infection with *C.albicans* and *C.tropicalis* in comparison to others , this probably due to feco-oral

contamination of the patient herself or the washing of under wear clothes are the most common source of C.albicans and C.tropicalis infection in C.P., the same results were reported by Ganor and Pumpianski [12], Marten [13].

In our study, the oral carriage of Candida spp. was investigated separately from 100 oral swabs taken from patients suffering from C.P. 36% was giving positive results, which was statistically significant because we are 95% confident that the true population (C.P.) are with in values (0.31-0.41) (these results confirm that the mouth is another source of C.P. infection. For our Knowledge this is the first study that had been conducted in our country and that correlated with the presence of oral Candida spp. in-patients with chronic paronychia up to date. However, Odds [14] isolated *C.albicans* from the mouth of only 10% of normal persons, while in 1988 Odds found the total oral yeast spp. carriage rate was 30% and that *C.albicans* was 20%. In another study that reported by Guggenheimer, [15] *Candida spp.*were isolated from the mouth of 15.1% of normal controlled group.

The different genera and species of gram-positive cocci were reported in table (2). High percentage (58.6%), 129 out of 220 were *S.aureus* in comparison to 77 (35%) *S.epidermidis* was isolated. The *Candida spp.* were 164 (72%), *Streptococcus pyogens* had been isolated from only 14 nail folds (6.3%). The differences between all of them are statistically significant; ($P < 0.01$). Barlow, et al [16] isolated *S.aureus* from 44 (48.4%), out of 91 nail folds, while only one isolates of *S.epidermidis*. Table (3) showing the different genera and species of *grams- negative bacilli* (single and double) are reported from 218 cases. Mixed *E.colli* with *Proteus spp.* were the highest incidence, 90 (41.3%) in comparison to *Proteus spp.* alone 44(20.1%). However the rest is range between 15 (6.9%) and 24(11%). These results again confirm the fecal source of contamination during hand-washing of contaminated clothes and self-contamination .As it is reported .

As it is reported in table (4); the right hand was frequently involved with C.P. 62% of 100 cases. The next are both hands 25%, and the left hand 8%, similar results had been reported by Sharquie and Al-omran [17] in which right hand was affected in 40 (80%) and left hand in 10(20%),out of 50 cases .The feet were only involved in 5% of the total cases ;the foot involvement is the first time reported by ours.

Table (5) shows the number and frequency of the type of fingers involved in both, right-handed and left-handed women. Out of 217; 48 cases (22.1%) were right thumbs involvement in comparison to 37 (17%) right middle fingers, 29 (13.3%) right ring fingers, 25 (11.5%) right index fingers, however low percentage 17 (7.8%) showing infection of left middle fingers, similar results was reported by Chow and Goh, .These results indicates that frequent mechanical trauma experienced when hand-washing of clothes by using the thumb, middle and ring fingers that pressing over the dorsa of the distal phalanges of the fingers; particularly the middle finger of other hand facilitate the frequency of infection.

In table (6); early recovery occur in 27% of treated patients with a regimen of topical clotrimazole (1%) + topical combination of gentamycin (0.1%) or clioquinol (30%) with steroid (0.1-0.2%) in which steroid was stopped after one week and continued on clotrimazole + gentamycin (0.3%), but the majority of the patients (51%) was recovered completely within 60 days of treatment despite the difference is statistically significant, some patients take longer period to recover (80days) ; because they

do not usually wear washing gloves and even if it is used, not all the time ; either because its` high cost or of hot weather; it is difficult to wear gloves for a long time as it may induce dermatitis in a humid hot environment .We didn't` find, research- worker who used the same regimen of treatment; some research workers; Jules and Bonar [18], Hochman [19] had used only topical steroids and antifungal agents, while Dawber, et al (1998) used combination of antibiotic and steroid. Habif [20] advised to the use of one or two drops of 3% thymol in 70% ethanol, while Barlow, et al, [21]gave topical application of gentamycin at day time and nystatin at night in which longer period was required for complete recovery (more than 80 days). It proves that the mixture of topical antifungal, antibiotic+ steroid play an important role in complete recovery in a short time.

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