Treatment of Chronic Paronychia: A Double Blind Comparative Clinical Trial Using Singly Vaseline, Nystatin and Fucidic Acid Ointment*

Khalifa E. Sharquie1#, Adil A. Noaimi2, Sunbul A. Galib3

1Scientific Council of Dermatology & Venereology, Iraqi Board for Medical Specializations, Department of Dermatology & Venereology, College of Medicine, University of Baghdad, Baghdad, Iraq; 2Department of Dermatology & Venereology, College of Medicine, University of Baghdad, Baghdad, Iraq; 3Department of Dermatology & Venereology, Baghdad Teaching Hospital, Baghdad, Iraq.

Email: #ksharquie@ymail.com

Received September 12th, 2013; revised October 10th, 2013; accepted October 18th, 2013

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ABSTRACT

Background: Chronic paronychia is a chronic inflammatory reaction of the proximal and lateral nail folds of multifactorial in etiology like irritant, bacterial and monilial causes. But housewife work is a major cause of chronic paronychia.

Objective: To assess the efficacy and prophylactic effects of Vaseline by occlusion of nail folds in comparison with nystatin ointment and fucidic acid in treatment of housewife chronic paronychia.

Patients and Methods: This double, blinded, comparative therapeutic, clinical trial is conducted at the Department of Dermatology-Baghdad Teaching Hospital from May 2010 to May 2011. Eighty female housewife patients with chronic paronychia were included in this trial. They were divided into three groups according to the following therapeutic model: Group A treated by Vaseline consisted of 40 patients; Group B and Group C treated by nystatin ointment, fucidic acid ointment respectively and each group consisted of 20 patients. All demographic points related to the disease were recorded from all patients. Invented score system was applied to assess the severity of disease and the response to therapy. Patients had used therapy twice daily on the proximal and lateral nail folds. Treatment duration was 12 weeks.

Results: Group A (Vaseline): The recovery rate after 12 weeks of treatment was 26 (65%) patients, while there was no recovery in 14 (35%) patients. Group B (Nystatin ointment): The recovery rate after 12 weeks was 13 (65%) cases and there was no recovery in 7 (35%) patients. Group C (Fucidic acid ointment): The recovery rate 12 weeks of treatment was 12 (60%) patients and there was no recovery in 8 (40%) patients. The earliest signs of recovery in all groups were decreased in nail fold tenderness, redness, swelling followed by improvement in the nail shape, then decreased in the separation of proximal nail fold from nail bed followed by re-growth of cuticle. There was significant difference in clinical response before and after therapy in all groups ($P \leq 0.0001$) while there was no statistical significant difference when the three groups were compared with each other ($P = 0.784$).

Conclusions: Vaseline occlusion therapy of the nail folds in patient with chronic paronychia was enough to induce recovery from the disease and there was no statistical significant difference when compared with nystatin or fucidic acid treatment of chronic paronychia.

Keywords: Housewife; Paronychia; Vaseline; Occlusive Therapy

1. Introduction

Chronic paronychia is a major health problem of which housewife paronychia is the main type seen in daily clinical practice [1].

The etiopathogenesis is multifactorial, but the wet condition during housewife work will cause loss of nail cuticle followed by separation of proximal and lateral nail folds and this will make a dead space thus allowing the entrance of water, detergents, bacteria under the nail folds followed by inflammation leading to the main features of chronic paronychia mainly swelling of the nail folds, nail dystrophy; this is so-called wet theory [2].

Accordingly, the presence of candida and bacteria like
Corticosteroids, calcineurin inhibitors, retinoids and proteins, and conditions requiring systemic or topical use of suppressive conditions, bone deformities, diabetes mellitus, and conditions requiring systemic or topical use of corticosteroids, calcineurin inhibitors, retinoids and proteinase inhibitors were not included.

A full history was taken from each patient regarding name, age, gender, marital status, residence, social status, job, number of children, using of gloves and washing machine, right or left hand, baking, smoking. Also duration, number of fingers involved, and type of treatment used before.

All patients were examined regarding right or left hand involvement or both, number of nails involved, presence of swelling, tenderness, and purulent discharge, presence of nail changes as buckled nail plates, transverse ridging, nail discoloration and associated onycholysis or dystrophy.

Formal consent was taken from each patient before starting the trial of treatment after full explanation of nature of disease, course, prognosis, complications, nature of drug, method of application, duration of treatment and follow up and the ethical approval was obtained from Scientific Council of Dermatology and Venereology, Iraqi Board for Medical Specializations.

Evaluation of the patients was done to re-evaluate the disease score and report any side effects from treatment clinically and by photograph during study period of 12 weeks.

All patients were photographed by a digital camera as a baseline and then on 12 weeks, in the same place with fixed illumination and distance by using a digital camera (Sony: Cyber shoot with resolution 12 mega pixels).

The following scoring system of the chronic paronychia was invented:

1) Loss of cuticle score = 1
2) Separation of proximal nail fold from nail bed with different grades and this was measured by orange stick introduced under the nail folds:
   a. Separation just score = 1
   b. Separation 2 mm score = 2
   c. Separation > 2 mm score = 3
3) Swollen nail fold:
   a. Swollen just score = 1
   b. Swollen red score = 2
   c. Swollen tender score = 3
4) Secondary nail changes:
   a. Ridging score = 1
   b. Dystrophy score = 3

When patients had multiple fingers involvement, the severely affected one was scored only and the others although treated they were not counted within scoring.

The treatment protocol: Patients were divided into 3 groups:

**Group A**: using topical white petrolatum (Vaseline®) manufactured by Anglo-Dutch Company Unilever.

**Group B**: using topical nystatin ointment in Vaseline base (Mycodin®) is manufactured by The State Company.

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Patients in Group A were treated by White petrolatum ointment; forty house wife patients were included in this group, their ages ranged from 15 - 60 years with mean ± SD of 36.37 ± 10.8 years. Married females were 32 (80%) patients. They had (0 - 8) children with mean of 4 children. Twenty seven (67.5%) patients were using washing machine, while only 3 (7.5%) patients were using gloves. Twenty (50%) patients were baking regularly. All of them were right handed 40 (100%). Duration of disease ranged from less than 1 year - 12 years with mean ± SD of 2.6 ± 3.44 years. Total number of 88 fingers was involved.

Right hand alone was involved in 29 (72.5%), while both right and left hands were involved in 11 (27.5%). Number of finger involved ranged from (1 - 7) with mean ± SD of 2 ± 1.55 finger. Seventeen (42.5%) patients with 1 finger involvement, 8 (20%) patients with 2 fingers, 8 (20%) patients with 3 fingers, 4 (10%) patients with 4 fingers, 3 (7.5%) patients with 6 fingers. No any side effect reported from treatment. Most commonly involved finger in right hand was middle finger 22 (55%) followed by thumb 19 (47.5%), ring finger 18 (45%), index 13 (32.5%) with no little finger involvement. While in left hand most common finger involved was thumb 7 (17.5%), both middle and ring fingers 4 (10%) and index only 1 (2.5%).

Patients in Group B were treated by nystatin ointment; twenty house wife patients were included in this group, their ages ranged from 19-55 years with mean ± SD of 37.40 ± 10.75 years. Married females were 18 (90%) patients. They had (0 - 7) children with a mean of 3 children. Twelve (60%) patients were using washing machine. Three (15%) patients were using gloves. Ten (50%) patients were baking regularly.

All of them were right handed 20 (100%). Duration of disease ranged from less than 1 year - 12 years with

| Table 1. The nail changes in patients of chronic paronychia at presentation. |
|-----------------------------|-----------------------------|-----------------------------|
|                             | Group A (Vaseline)          | Group B (Nystatin ointment) | Group C (Fucidic acid ointment) |
| Loss of cuticle             | 40 100                      | 20 100                      | 20 100                      |
| Nail fold swelling          | 40 100                      | 20 100                      | 20 100                      |
| Separation of nail fold from nail plate | 40 100                      | 20 100                      | 20 100                      |
| Transverse ridging          | 39 95                       | 20 100                      | 20 100                      |
| Longitudinal ridging        | 8 20                        | 2 10                        | 2 10                        |
| Nail pitting                | 28 70                       | 13 65                       | 10 50                       |
| Onycholysis                 | 8 20                        | 1 5                         | 2 10                        |
| Nail plate dystrophy        | 5 12.5                      | 3 15                        | 2 10                        |
| Color changes               | 34 85                       | 17 85                       | 15 75                       |

Eighty housewife patients with chronic paronychia were completed the study their ages ranged from 15 - 68 with mean ± SD of 37.26 ± 11.06 years. The role of contributing factors showed that moisture; super hydration, detergents and rough work played the highest role in damaging the nail cuticle and nail folds in all patients. Duration of disease ranged from half year- 12 years with mean± SD of 2.166 ± 2.66 years. Total numbers of 184 fingers involved in 3 groups. Number of finger involved ranged from (1 - 8) with mean ± SD of 2 ± 9.61 fingers. The nail changes in patients of chronic paronychia demonstrated in (Table 1).
mean ± SD of 1.98 ± 2.74 years. Total number of 39 fingers was involved. Number of finger involved ranged from (1 - 8) with mean of ± SD of 2 ± 1.71 fingers, thirteen (65%) patients with 1 finger involvement, 2 (10%) patients with 2 fingers, 3 (15%) patients with 3 fingers, 1 (5%) patient with 4 fingers, 1 (5%) patient with 8 fingers. No any side effect reported from treatment. Right hand alone was involved in 13 (65%), left hand was involved in 2 (5%), while both right and left hands were involved in 5 (25%). Most commonly involved finger in right hand was thumb 11 (55%) followed by ring finger 7 (35%), middle finger 5 (25%), index 4 (20%), little finger only 1 (5%), while in left hand most common finger involved was middle 4 (20%), followed by index 3 (15%), then both ring and thumb 2 (10%) for each one while little finger was not involved.

Patients in Group C were treated by fucidic acid ointment; twenty house wife patients were included in this group, their ages ranged from 22 - 68 years with mean ± SD of 38.90 ± 12.195 years. Married females were 19 (95%) patients; they had (0 - 8) children with a mean of 4 children.

Eleven (55%) patients were using washing machine. One (5%) patient was using gloves. Nine (45%) patients were baking regularly. All of them were right handed 20 (100%). Duration of disease ranged from less than 1 year - 10 years with mean ± SD of 2.035 ± 2.178 years. Total number of 57 fingers was involved.

Number of finger involved ranged from (1 - 6) with mean of ± SD of 3 ± 1.576 fingers, four (20%) patients with 1 finger involvement, 7 (35%) patients with 2 fingers, 3 (15%) patients with 3 fingers, 3 (15%) patients with 4 fingers, 1 (5%) patient with 5 fingers, 2 (10%) patients with 6 fingers. No any side effect reported from treatment. Right hand alone was involved in 12 (60%), while both right and left hands were involved in 8 (40%). Most commonly involved finger in right hand was thumb 16 (80%) followed by index and middle fingers 10 (50%) for each finger, then ring finger 5 (25%), little finger only 1 (5%), while in left hand most common finger involved was thumb 6 (30%), followed by index 4 (20%), then middle 3 (15%) Lastly ring finger was 2 (10%).

Clinical Response

According to the present study results we can divide patients in each group into: patients with recovery and patient without recovery.

1. Recovery: either cured: re-growth of cuticle, nail folds separated from nail bed, normal proximal nail fold, nail plate grows normally or improved: absence of cuticle, nail folds just separated from nail bed, normal proximal nail fold, nail plate grows normally (score = 0 - 2).

2. No recovery: either stable: absence of cuticle, nail folds separated from nail bed > 2 mm, proximal nail folds just swollen, abnormal nail plate (ridging, dystrophy) or worse: absence of cuticle, nail fold separated from nail bed > 2 mm, proximal nail fold swollen tender, abnormal nail plate (ridging, dystrophy) with purulent inflammation of the proximal nail fold (score = 3 - 11).

There were highly statistically significant differences in recovery of paronychia in all groups when we compared the scoring before and after therapy after 3 months of treatment (P ≤ 0.0001) (Table 2 and Figure 1).

When the three groups where compared between each other, there was no significant statically difference in recovery rate between them (P = 0.784) (Table 3).

4. Discussion

Chronic paronychia is an inflammatory dermatosis of the nail folds, with secondary effects on the nail matrix; nail growth and soft-tissue attachments [5].

The etiology of chronic paronychia is multifactorial in origin [6]. Infection by multiple organism, especially yeasts (commonly Candida albicans) and intestinal bac-

<table>
<thead>
<tr>
<th>Group</th>
<th>Range of score</th>
<th>Mean of score</th>
<th>St. dev.</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Before 7 - 11</td>
<td>8.10</td>
<td>1.150</td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td></td>
<td>Vaseline After</td>
<td>3.65</td>
<td>2.627</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Before 5 - 11</td>
<td>7.85</td>
<td>1.348</td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td></td>
<td>Nystatin After</td>
<td>3.60</td>
<td>2.945</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Before 6 - 11</td>
<td>8.15</td>
<td>1.348</td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td></td>
<td>Fucidin After</td>
<td>3.70</td>
<td>2.452</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. The clinical response to treatments in the 3 groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Group A (Vaseline)</th>
<th>Group B (Nystatin)</th>
<th>Group C (Fucidin)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.  %</td>
<td>No.  %</td>
<td>No.  %</td>
</tr>
<tr>
<td>Recovery rate</td>
<td>26 65</td>
<td>13 65</td>
<td>12 60</td>
</tr>
<tr>
<td>No recovery rate</td>
<td>14 35</td>
<td>7 35</td>
<td>8 40</td>
</tr>
<tr>
<td>Total</td>
<td>40 100</td>
<td>20 100</td>
<td>20 100</td>
</tr>
<tr>
<td>Chi-Square (χ²)</td>
<td>0.487</td>
<td>2</td>
<td>0.784</td>
</tr>
</tbody>
</table>
Chronic paronychia is a major health problem among Iraqi house wife dermatoses as it accounts for 33.3% of the whole occupational housewife dermatoses [2].

It is well established that house wife work is the main etiological factor in the etiopathogenesis of chronic paronychia where it works through the following factors: the wet condition and the trauma of house work will cause loss of nail cuticle followed by separation of proximal and lateral nail folds this will allow water, detergents, bacteria to enter under the nail folds followed inflammation leading to the main features of chronic paronychia mainly swelling of the nail folds, nail dystrophy, this is so called wet theory [2].

Sharquie et al. performed a study in 1990 on microbiology of chronic paronychia in Iraqi housewives. [2] The primary isolation from cultures on Sabouraud’s agar showed Candida organisms in 93.3% of the cases, of which 88.3% were Candida albicans, while the bacterial isolates were mainly: Coliform in 33.3%, Pseudomonas aeruginosa plus coliform in 26.6%, Proteus species plus coliforms in 8.3%, Staphylococcus aureus 16.6%, and other organisms as Diphtheroids, Streptococcus fecalis, and Staphylococcus albus [2]. And these findings were supported by further studies [8].

But presence of these bacteria and candida might play secondary role in the pathogenesis of paronychia [2]. So, the therapy of chronic paronychia is mainly through prevention of house work through wearing gloves. Still many dermatologists use antibacterial and antifungal therapy for long time to treat chronic paronychia but in most of cases there is a failure of treatment [2]. So, the aim of present work is the treatment of paronychia just through using any ointment like Vaseline to block the entrance of detergents and bacteria under the nail folds and to the dead space under these folds. And this treatment was compared with topical antifungal and antimicrobial agents.

The results of present study showed that using Vaseline, nystatin or fucidic acid where highly statistically significant effective in clearing paronychia (P ≤ 0.0001), when these groups where compared with each other there was no statistically difference (P = 0.784).

The group that used Vaseline showed the following results: recovery rate was 26 (65%) patients, while there was no recovery in 14 (35%) patients, while patients in nystatin group showed recovery rate in 13 (65%) patients, while there was no recovery in 7 (35%) patients. While, patients on fucidic acid ointment gave recovery rate in 12 (60%) patients, while there was no recovery in 8 (40%) patients. Accordingly, the present study had proved that occlusion of nail folds from wetting condition through using Vaseline or antimonilial ointment or antibacterial ointment was enough to clear signs and
symptoms of paronychia and even might prevent the re-
lapse of the disease through ointment. The present re-
search to the best of our knowledge is the first one that
has been carried out in the field of chronic paronychia.

5. Conclusion

In conclusion, treatment of paronychia by occlusive
therapy using Vaseline alone is enough to induce recov-
ery and clearance of housewife paronychia.

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