RESULTS

One hundred female patients presenting with simple CP were included in the present study.

I- Clinical results:

1- The range of age/year for all patients in the studied groups was (19-45) years (Table 4).

2- The range of disease duration/ months among the studied groups was (3-24) months (Table 5).

3- Rt thumb was the most frequently affected followed by Lt. thumb, and Rt. middle finger. the total number of the affected fingers among all patients in the studied groups was 295 fingers (Table 6).

Table (4): Statistical comparison between studied groups as regard the age/year.

Age / Group	Mean	± SD	Range	ANOVA	
G1	31.2	5.9	23-40	$F_{4.95}$	*P-value*
G 2	35.1	11	19-52	2.3	> 0.05
G 3	29.5	5	21-40		
G 4	33	7.2	23-45		
G 5	29	6.6	19-39		
Total	31.6	7.6	19-52		

Statistical comparison between studied groups as regard the age/year was non significant (P value > 0.05).

Table (5): Statistical comparison between groups as regard the disease duration/months.

Disease duration / Groups	Mean	± SD	Range	ANOVA	
G1	13.5	6.9	6-24	$F_{4.95}$	*p-value*
G2	12.9	7.3	3-24	0.7	> 0.05
G3	11.2	5.6	3-18		
G4	14.5	6.1	6-24		
G5	12.5	6.3	6-24		
Total	12.9	6.4	3-24		

Statistical comparison between studied groups as regard the disease duration/months was non significant (P value > 0.05).

Table (6): The distribution of affected fingers among the studied groups

Finger affected	Number	Percentage %
Right thumb	61	61
Left thumb	55	55
Right middle	51	51
Left middle	48	48
Right index	36	36
Left index	17	17
Right ring	13	13
Left ring	7	7
Right little	5	5
Left little	2	2

II- Investigative results:

1- Results of KOH 20%

Candida was present by KOH 20% before treatment in 35 patients (35.0%) from all the patients in studied groups, at the end of treatment in 24 patients (24.0%) from all patients in the studied groups and in 16 patients (16.0%) from all patients in the studied groups at the follow up visit (Table 7).

2- Results of culture on SDA +C medium:

Candida was present by culture on SDA +C media in 50 (50.0%) patients before treatment. At the end of treatment, Candida was isolated in 39 patients (39.0%) in all the studied groups and in 29 patients (29.0%) in all the studied groups at the follow up visit (Table 8) (Fig. 5, 6, 7).

3- Candida by KOH 20% and Culture on SDA + C medium:

There were 20 patients (20.0%) positive for Candida only by culture on SDA+C medium, 30 patients (30.0%) were positive for both culture on SDA +C medium and KOH 20% and 5 (5%) patients were positive for Candida by KOH 20% negative culture before treatment. fifteen (15%) patients were positive Candida only by culture on SDA +C and 24 patients (24.0%) positive for both culture on SDA+C medium and KOH 20% at the end of the treatment period. Thirteen patients (13.0%) were positive for Candida by culture on SDA+C medium and 16 patients were positive for culture and KOH 20% at the follow up visit (Table 9) .

The sensitivity of KOH 20% before treatment was 60%. The specificity was 90% the positive predictive value of the test was 85% while the negative predictive value was 69%.

4- Results of culture on rice agar and biochemical reactions:

Fifty five patients from all patients in the studied groups were positive for Candida before the start of treatment. Culture on rice agar medium and biochemical reactions (sugar fermentation and sugar assimilation tests) were done for identification of the strains of Candida. Fifty one patients (92.7%) were positive for Candida albicans, 2 patients (3.6%) were positive for Candida glabrata and 2 patients (3.6%) were positive for Candida parapsilosis from all patients in the studied groups. Microscopic appearance of Candida albicans showed elongated pseudohypheal cells and many terminal chlamydospores. C.parapsilosis on rice agar showed short thin cells with pronounced curve, and occasional giant cells. While C. glabrata showed globose or oval cells with occasional short branched chains (Fig. 8,9). The results of sugar fermentation and assimilation tests were shown in (Table 10).

5- Results of standard (TRUE) patch test:

Table (11) and (12) showed the results of standard patch (TRUE) test. The number of positive reaction exceeded the number of positive patients because 2 patients had more than one positive reaction. Nickel sulphate, paraphenyline diamine, fragrance mix and black rubber mix were the most common allergens among the studied groups (Fig. 12,13,14).

6- Results of open patch test:

a- ***Clinical :***

Thirty three patients (33.0%) from all patients in the studied groups showed positive reaction to open patch tests in the form of immediate erythematoedematous or vesicular reaction on the PNF to one or more of foods that they handled (Table 13).

b- Pathology examination:

The PNF biopsy specimens obtained before the open patch tests with foods showed a small amount of parakeratosis in the horny layer, exocytosis and focal spongiosis. A moderately dense mononuclear superficial perivascular infiltrate was present in the dermis (Fig. 10).

Biopsy specimens of the positive open patch test reactions of the PNF revealed more eczematous changes. Both the dorsal and the ventral portions of the PNF showed exocytosis, spongiosis and vesiculation. The papillary dermis was slightly edematous and contained a moderate to dense mononuclear superficial perivascular infiltrate (Fig. 11).

Table (7): Incidence of the presence of Candida by KOH 20% before treatment at the end of treatment and at the follow up visit among the studied groups.

	Before treatment		**3 weeks after**		**6 weeks after**	
	N=20	%	N=20	%	N=20	%
G1	7	35	4	20	2	10
G2	7	35	6	30	5	25
G3	7	35	5	25	3	15
G4	8	40	4	20	1	5
G5	6	30	5	25	5	25
Chi square	0.5		0.8		4.7	
P-value	> 0.05 (N.S.)		> 0.05 (N.S.)		> 0.05 (N.S.)	

Comparison between groups as regard the presence of Candida by KOH 20% before treatment, at the end of treatment and at the follow up visit was non significant (P value > 0.05).

Table (8): Incidence of the presence of Candida by culture on SDA+C medium before treatment, at the end of treatment and at the follow up visit among the studied groups.

	Before treatment		**End of 3 weeks**		**6 weeks after**	
	N=20	%	N=20	%	N=20	%
G1	10	50	7	35	4	20
G2	9	45	9	45	9	45
G3	10	50	8	40	6	30
G4	12	60	6	30	1	5
G5	9	45	9	45	9	45
Chi Square	1.2		1.4		11.3	
P value	> 0.05		> 0.05		> 0.02	

Comparison between groups as regard the presence of Candida by culture on SDA +C medium before treatment and at the end of treatment was non significant (p – value > 0.05) while at the follow up visit it is significant (p value > 0.02)

Table (9): Incidence of the presence of Candida by culture on SDA+C medium and KOH 20% before treatment, at the end of treatment and at the follow up visit among the studied groups

		Before treatment		**End of 3 weeks**		**6 weeks after**	
		Culture	KOH	Culture	KOH	Culture	KOH
G1	No.	10	6	7	4	4	2
	%	50	30	35	20	20	10
G2	No.	9	6	9	6	9	5
	%	45	30	45	30	45	25
G3	No.	10	6	8	5	6	3
	%	50	30	40	25	30	15
G4	No.	12	7	6	4	1	1
	%	60	35	30	20	5	5
G5	No.	9	5	9	5	9	5
	%	45	25	45	25	45	25

Table (10): Results of biochemical reactions (sugar fermentation and assimilation tests):

Fermentation					Candida	Assimilation						
G	S	M	L	D		D	G	M	S	T	L	X
+	-	+	-	+	C.albicans	+	+	+	+	+	-	-
+	-	-	-	+	C.parapsilosis	+	+	+	+	+	-	+
-	-	-	-	+	C. glabrata	+	-	-	-	+	-	-

D=dextrose

G=galactose

S=sucrose

M=maltose

L= lactose

X=xylose

T=trehalose

Table (11): Results of standard patch test among the studied groups

Parameters	No. of Patients		No. of +ve reactions
	No.	%	
G 1 (N=20)	2	10	3
G 2 (N=20)	2	10	2
G 3 (N=20)	4	20	5
G 4 (N=20)	4	20	4
G 5 (N=20)	3	15	3
Total (N=100)	15	15	17
Patches:			
Nickel sulfate	6		6
Paraphenylenediamine	2		2
Fragrance mix	2		2
Black rubber mix	2		2
Neomycin sulfate	1		1
Formaldehyde	1		1
Potassium dichromate	1		1
Cobalt chloride	1		1
Quaternium 15	1		1
Chi square	1.5		
P value	> 0.05		

Comparison between groups as regard the number of positive reaction was non-significant (p value > 0.05, chi square 1.5)

Table (12): Results of standard patch test among the studied groups as regard to the type of reaction.

Group	Number of patients	Allergens	Types of reactions
G1	2	Nickel sulphate	++ (Strong positive)
		Para phenylenediamine	+ (weak positive)
		Fragrance mix	+
G2	2	Nickel sulphate	+
		Para phenylenediamine	+
G 3	4	Nickel surfate	+
		Fragrance mix	++
		Black rubber mix	++
		Potassium dichromate	+
		Cobalt chloride	+
G4	4	Nickel sulphate	+
		Black rubber mix	+
		Neomycin sulphate	+
		Nickel sulphate	++
G5	3	Nickel sulphate	+
		Formaldehyde	++
		Quaternium 15	+

Comparison between groups as regard result of open patch tests was non significant (p value > 0.05, chi square > 2.1)

Table (13): Results of open patch test using fresh foods as garlic, onion and tomato among the studied groups.

Parameters	**Patients**		**Number of +ve reaction**
	Number	%	
G 1 (N=20)	6	30	(4) garlic – (2) onion
G 2 (N=20)	5	25	(2) garlic – (2) onion –(1) tomato
G 3 (N=20)	9	45	(3) garlic – (4) onion – (2) tomato
G 4 (N=20)	7	35	(4) garlic –(1) onion –(2) tomato
G 5 (N=20)	6	30	(2) garlic (2) onion –(2) tomato
Total (N=100)	33	33	33
Patches			
Garlic	15		
Onion	11		
Tomato	7		
Chi square	> 2.1		
P-value	> 0.05		

Comparison between groups as regard results of open patch tests was non significant (p value > 0.05, Chi square > 2.1).

III- Therapeutic results:

Tables (14) and (15) showed the clinical response to treatment at the end of treatment and at the follow up visit respectively in terms of improved patients, cured patients, worsened and unchanged patients among the studied groups (Fig. 15 to 30).

There was a statistically significant difference between groups as regard the clinical response to treatment at the end of treatment and at the follow up visit. G4 showed highly significant clinical response to treatment at 3ws and 6ws as the total number of improved / cured patients were 14 patients (70.0%) at the end of treatment and 19 patients (98.0%) at the follow up visit.

Tables (16) and (17) showed comparison between the studied groups as regard the clinical response to treatment at the end of treatment and follow up visit respectively.

The clinical cure at the end of treatment and at the follow up visit was highly significant in fingers treated with itraconazole capsules, ciprofloxacin tablets and fluticasone propionate cream (G4) as compared with other groups.

Analysis of Tables (18) & (19) shows that eradication of Candida was not correlated with clinical cure in some patients, both at the end of treatment and the follow up visit, for example in G3 there was 5 patients improved although they were candida positive.

There was no significant statistical correlation between the age of patients and the disease duration/month among patients in the studied groups and the response to treatment at the end of treatment and the follow up visit (Table 20).

Table (14): Incidence of the clinical response to treatment at the end of treatment among the studied groups.

		Clinical response at the end of treatment				**Total**
		Worsened	Unchanged	Improved	Cured	
G1	No.	5	12	2	1	20
	%	25	60	10	5	100
G2	No.	-	19	1	-	20
	%	-	95	5	-	100
G3	No.	6	9	5	-	20
	%	30	45	25	-	100
G4	No.	-	6	11	3	20
	%	-	30	55	15	100
G5	No.	8	11	1	-	20
	%	40	55	5	-	100
Total	No.	19	57	20	4	100
	%	19	57	20	4	100
P value	< 0.001					
Chi-square	48.7					

This table shows that there was a statistically significant difference between groups as regard the clinical response to treatment at the end of treatment (Chi square 48.7, *p-value < 0.001*).

Table (15): Incidence of the clinical response to treatment at the follow up visit among the studied groups.

		Clinical response at the follow up visit				Total
		Worsened	Unchanged	Improved	Cured	
G1	No.	5	8	5	2	20
	%	25.5	40	25	10	100
G2	No.	-	19	1	-	20
	%	-	95	5	-	100
G3	No.	6	9	5	-	20
	%	30	45	25	-	100
G4	No.	-	1	14	5	20
	%	-	5	70	25	100
G5	No.	8	11	1	-	20
	%	40	55	5	-	100
Total	No.	19	48	26	7	100
	%	19	48	26	7.0	100
P-value	< 0.001					
Chi-square	66.7					

This table shows that there was a statistically significant difference between groups as regard the clinical response to treatment at the follow up visit (Chi square 66.7, *p-value < 0.001).*

Tables (16) : Comparison between the studied groups as regard the clinical response to treatment at the end of treatment.

Group	Vs groups	Z	P value
G1	G2	1.0	> 0.05
G1	G3	0.1	> 0.05
G1	G4	3.5	< 0.001
G1	G5	1.3	> 0.05
G2	G3	0.6	> 0.05
G2	G4	4.2	< 0.001
G2	G5	0.1	> 0.05
G3	G4	3.3	< 0.001
G3	G5	1.3	> 0.05
G4	G5	4.5	< 0.001

This table shows that there was a statistically significant difference between G4 and G1, G2, G3, G5 (p value < 0.001) as regard to the clinical response to treatment at the end of treatment.

Tables (17): Comparison between the studied groups as regard the clinical response to treatment at the follow up visit.

Group	Vs groups	Z	P value
G1	G2	0.4	> 0.05
G1	G3	0.7	> 0.05
G1	G4	3.5	< 0.001
G1	G5	1.9	> 0.05
G2	G3	0.6	> 0.05
G2	G4	5.4	< 0.001
G2	G5	0.5	> 0.05
G3	G4	4.5	< 0.001
G3	G5	1.3	> 0.05
G4	G5	5.3	< 0.001

This table shows that there was a statistically significant difference between G4 and G1, G2, G3, G5 (p value < 0.001) as regard to the clinical response to treatment at the follow up visit.

Table (18): Relation between the results of culture on SDA +C medium and clinical response to treatment at the end of treatment among the studied groups.

Groups	Culture at 3weeks		Response to treatment at 3 weeks				Total
			Worsened	Unchanged	Improved	Cured	
G 1	Negative	No		10	2	1	13
		%		50	10	5	65
	Positive	No	5	2	-	-	7
		%	25	10	-	-	35
	Total	No	5	12	2	1	20
		%	25	60	10	5	100
G 2	Negative	No	-	11	-	-	11
		%	-	55	-	-	55
	Positive	No	-	8	1	-	9
		%	-	40	5	-	45
	Total	No	-	19	1	-	20
		%	-	95	5	-	100
G 3	Negative	No	-	9	3	-	12
		%	-	45	15	-	60
	Positive	No	6	-	2	-	8
		%	30	-	10	-	40
	Total	No	6	9	5	-	20
		%	30	45	25	-	100
G 4	Negative	No	-	3	8	3	14
		%	-	15	40	15	70
	Positive	No	-	3	3	-	6
		%	-	15	15	-	30
	Total	No	-	6	11	3	20
		%	-	30	55	15	100
G 5	Negative	No	-	10	1	-	11
		%	-	50	5	-	55
	Positive	No	8	1	-	-	9
		%	40	5	-	-	45
	Total	No	8	11	1	-	20
		%	40	55	5	-	100

In G4 there was 11 patients (55.0%) improved (8 patients were Candida negative and 3 patients were Candida positive) and 3 patients (15.0%) cured which were Candida negative.

Table (19): Relation between the results of culture on SDA+C medium and clinical response to treatment at the follow up visit

Groups	Culture at 6 weeks		Clinical response to treatment at 6 weeks				Total
			Worsened	Unchanged	Improved	Cured	
G 1	Negative	No	1	8	5	2	16
		%	5	40	25	10	80
	Positive	No	4	-	-	-	4
		%	20	-	-	-	20
	Total	No	5	8	5	2	20
		%	25	40	25	10	100
G 2	Negative	No	-	11	-	-	11
		%	-	55	-	-	55
	Positive	No	-	8	1	-	9
		%	-	40	5	-	45
	Total	No	-	19	1	-	20
		%	-	95	5	-	100
G 3	Negative	No	2	9	3	-	14
		%	10	45	15	-	70
	Positive	No	4	-	2	-	6
		%	20	-	10	-	30
	Total	No	6	9	5	-	20
		%	30	45	25	-	100
G 4	Negative	No	-	1	13	5	19
		%	-	5	65	25	95
	Positive	No	-	-	1	-	1
		%	-	-	65	-	5
	Total	No	-	1	14	-	20
		%	-	5	70	-	100
G 5	Negative	No	-	10	1	-	11
		%	-	50	5	-	55
	Positive	No	8	1	-	-	9
		%	40	5.0	-	-	45
	Total	No	8	11	1	-	20
		%	40	55	5	-	100

In G3 there was 5 patients improved (3 patients were Candida negative and 2 patient were Candida positive). In G4 there was 14 patient improved (13 patients were Candida negative and 1 patients was Candida positive) and 5 patients cured which were Candida negative.

Table (20): Correlation between age, disease duration and clinical response to treatment at the end of treatment and the follow up visit.

Clinical response		**Age**	**Disease duration**
At the end of the treatment	r	0.076	0.051
	P value	> 0.05	> 0.05
At the follow up visit	r	0.087	0.030
	P value	> 0.05	> 0.05

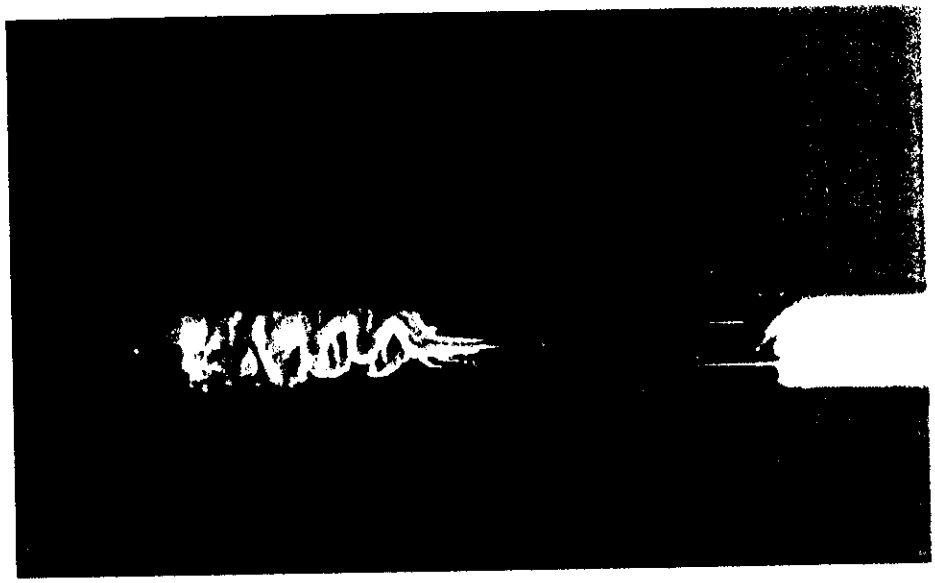

Fig. (5): Subculture of Candida albicans on SDA+C medium

Fig. (6): Subculture of Candida parapsilosis on SDA+C medium

Fig. (7): Subculture of Candida glabrata on SDA+C medium

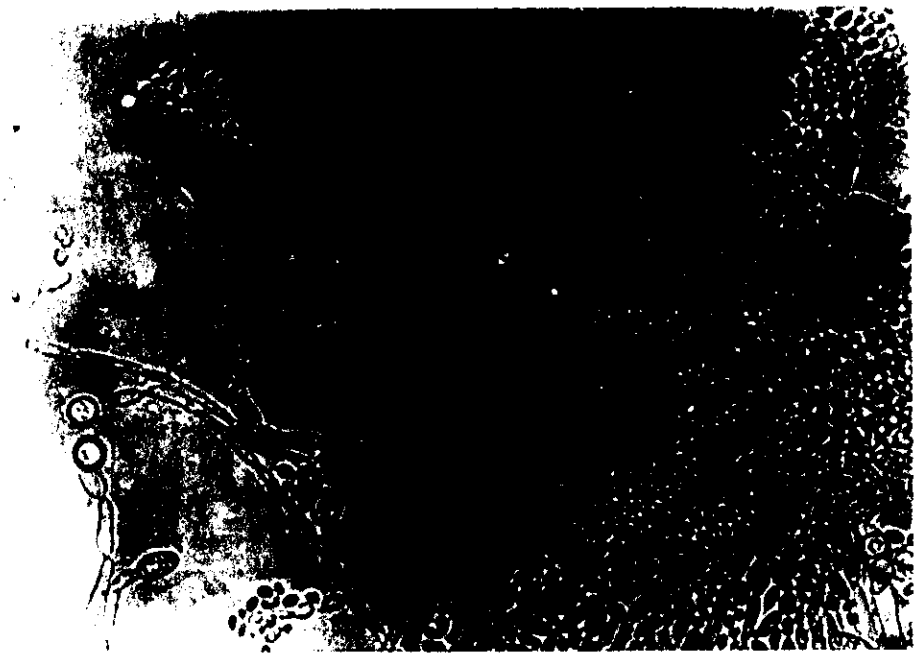

Fig. (8): Microscopic examination on rice agar showed chamydospores of Candida albicans

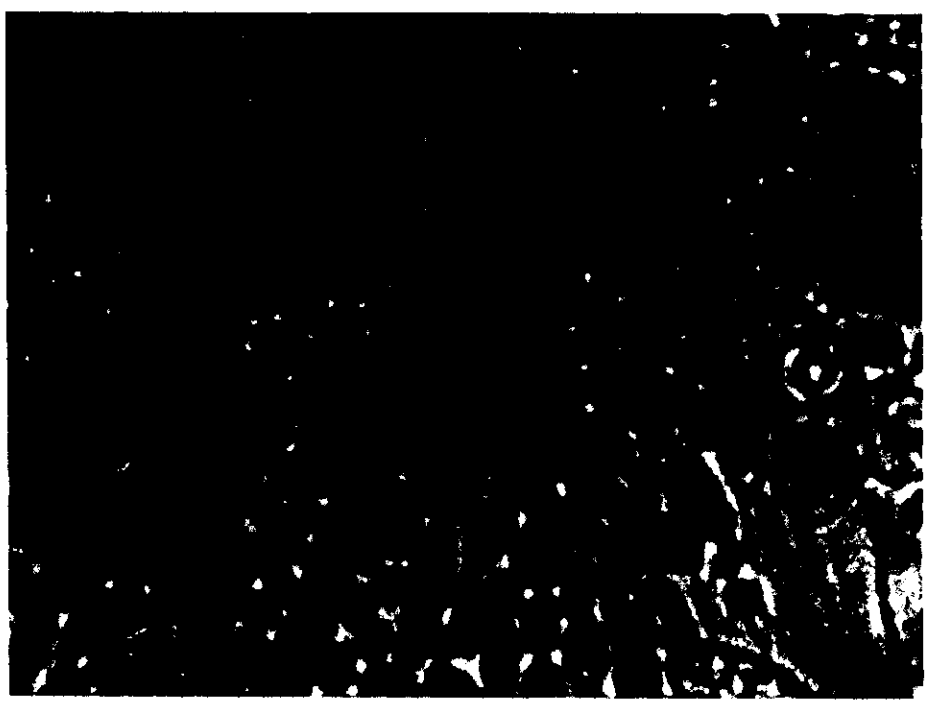

Fig. (9): Microscopic examination on rice agar showed blastospores and pseudohyphae of Candida species

Fig. (10): Microscopic examination of PNF biopsy before open patch test, showed focal spongiosis

(Hx & E staining x 100)

*Fig. (11): Microscopic **examination of PNF biopsy after positive open patch test, which showed exocytosis, spongiosis and vesiculation of the epidermis** (Hx & E staining x 400)*

Fig. (12): TRUE test, method of application

Fig. (13): Weak positive reaction of fragrance mix, Quaternium 15 and formaldehyde

Fig. (14): Close view to the weak positive reaction showing erythema, infiltration and papules

Clinical response to systemic antifungal

Fig. (15): G1a before treatment

Fig. (16): G1a at the end of treatment (unchanged)

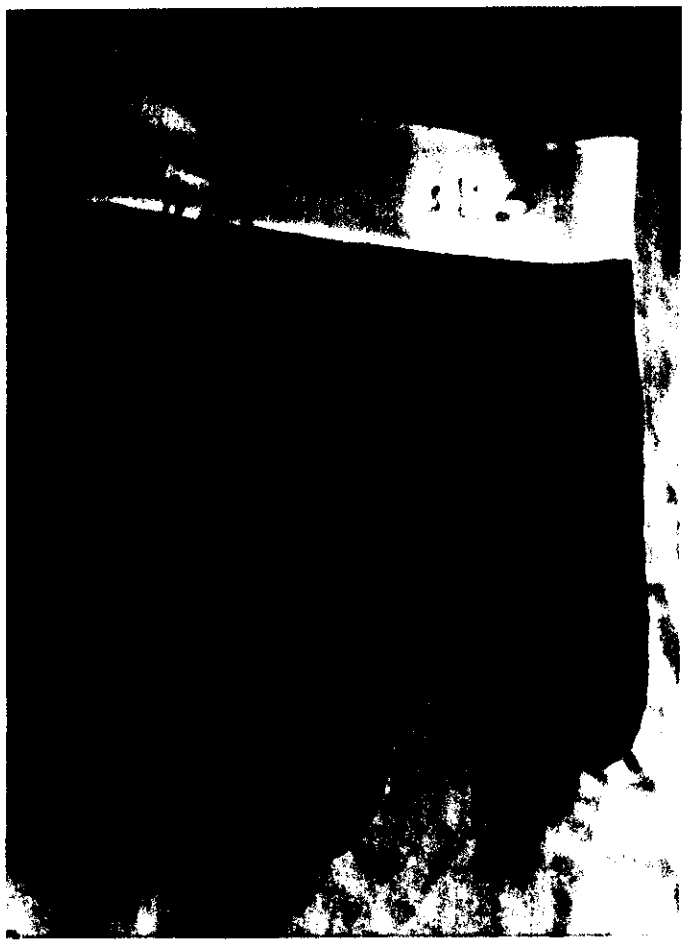

Fig. (17): G1a at the follow up visit (improved)

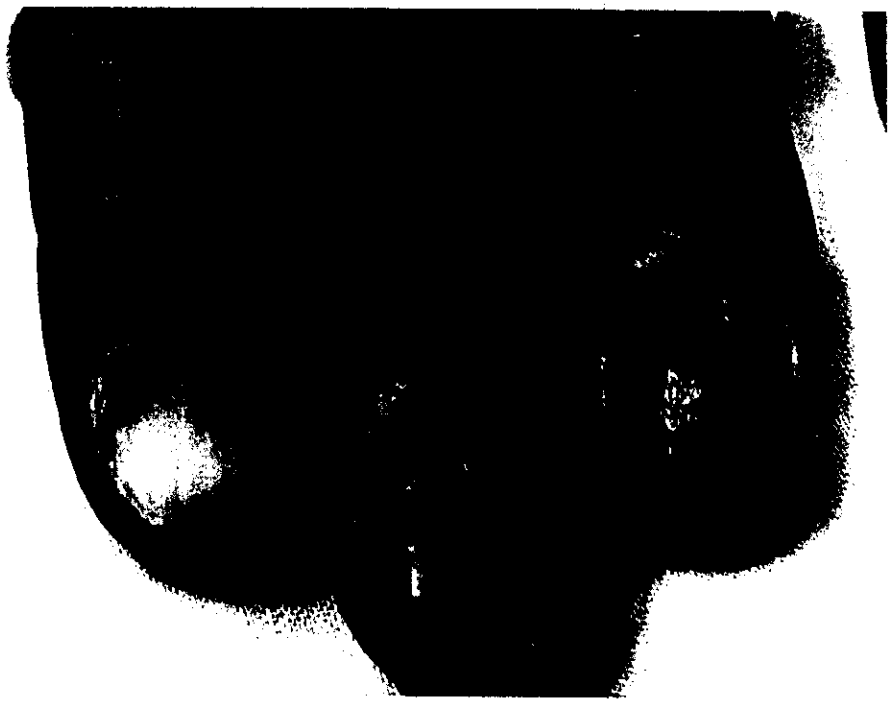

Fig. (18): G1b before treatment

Fig. (19): G1b at the end of treatment (unchanged)

Clinical response to systemic antibiotic

Fig. (20): G2 before treatment

Fig. (21): G2 at the end of treatment (unchanged)

Fig. (22): G2 at the follow up visit (unchanged)

Clinical response to topical steroid

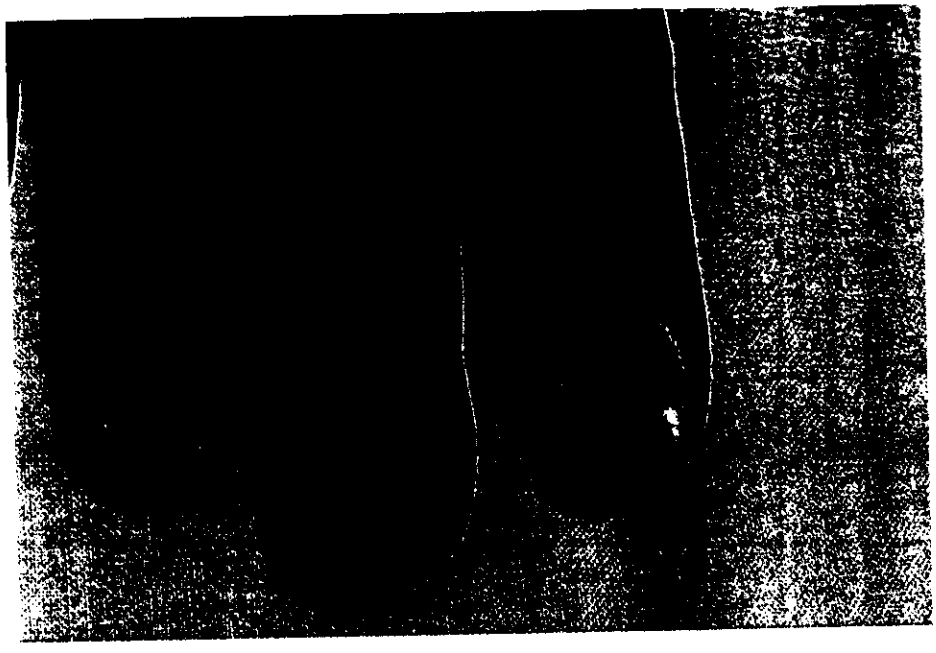

Fig. (23): G3a before treatment

Fig. (24): G3a at the end of treatment (improved)

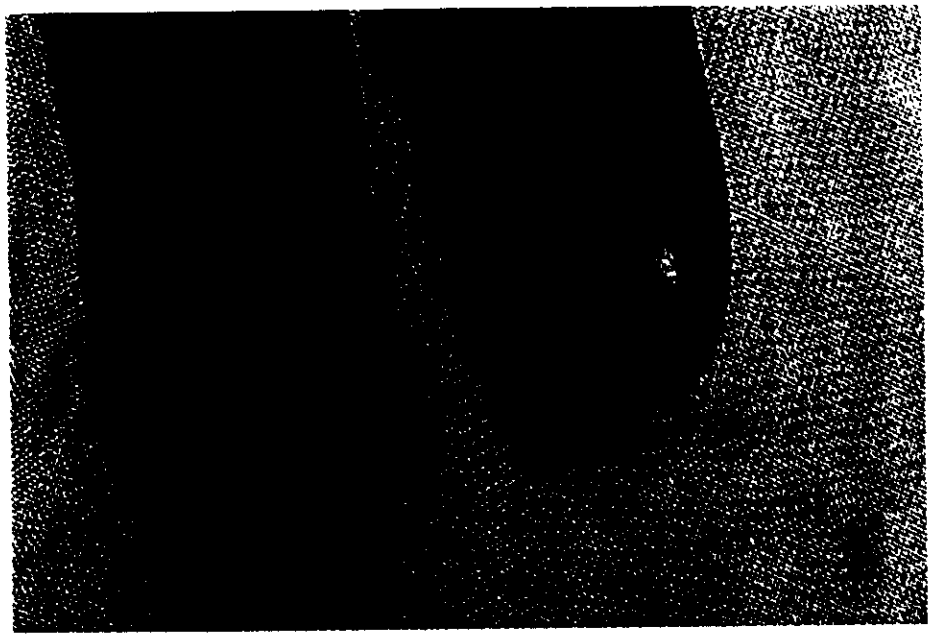

Fig. (25): G3a at the follow up visit (improved)

Fig. (26): G3b before treatment

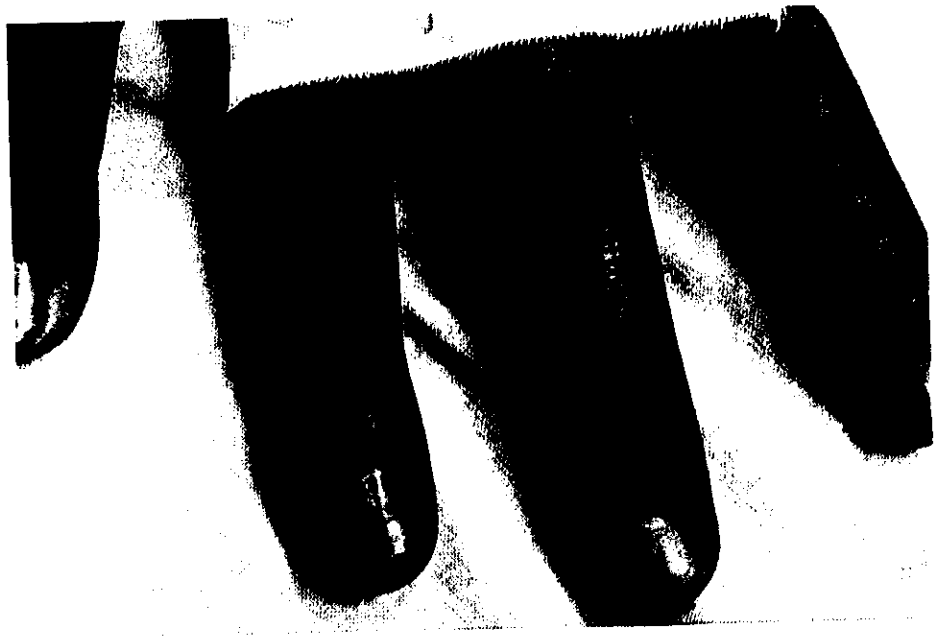

Fig. (27): G3b at the end of treatment (unchanged)

Clinical response to systemic antifungal, systemic antibiotic and topical steroid:

Fig. (28): G4 before treatment

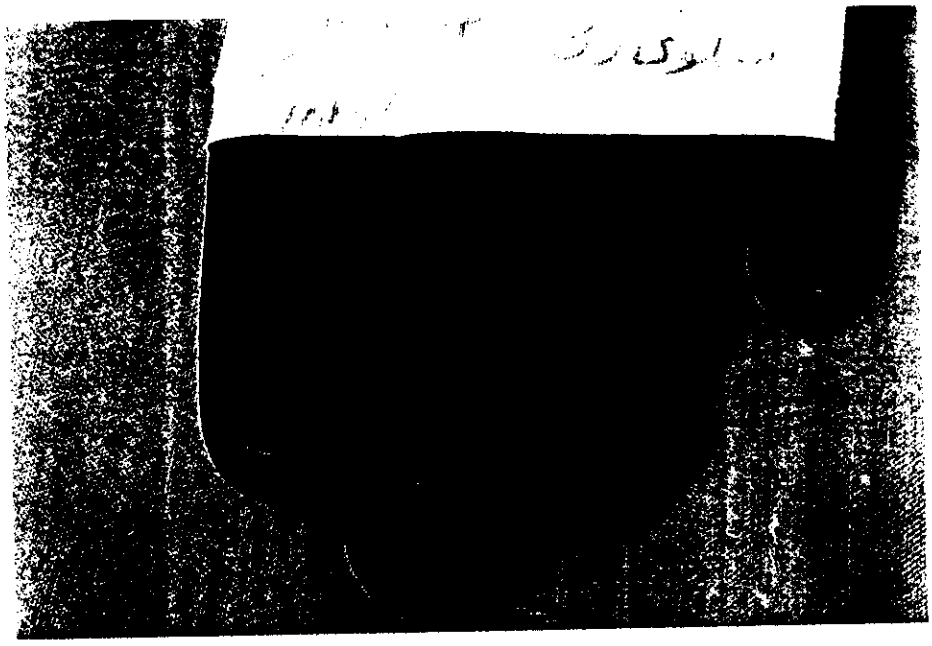

Fig. (29): G4 at the end of treatment (cured)

Fig. (30): G4 at the follow up visit (cured)