

## Clinical Evaluation of a Formulated Econazole Nitrate as A Topical Solution

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### ABSTRACT

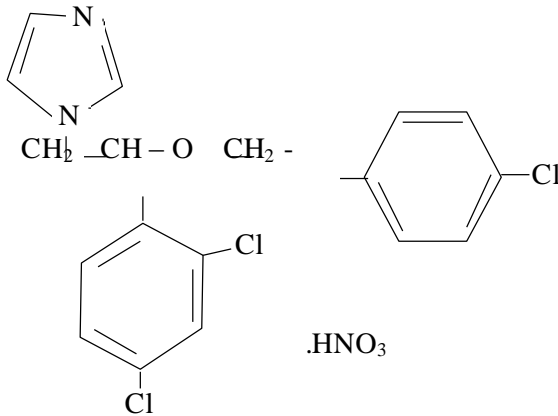
Econazole nitrate (EN) is considered as the most effective agent for the treatment of all forms of dermatomycosis caused by dermatophytes. It was formulated as a topical solution in our laboratories. This study was designed to evaluate the effectiveness of Econazole Nitrate in the prepared formula and compared with that of commercial brand, Pevaryl®. A total of 104 patient suffering from dermatomycoses were involved in this investigation. Both formula were applied to the affected skin region in the morning and evening from week to 16 weeks with light massage until complete healing effect was achieved. The data revealed that the percentage of cured patient treated with the prepared formula and reference formula of Econazole Nitrate 1% solution were 90.3% and 88.4% respectively also chronic cases could be largely cured by treatment with the prepared formula Econazole Nitrate 1% solution. The results of this clinical investigation showed that the prepared formula of Econazole nitrate 1% was effective as compared to that of the commercial brand, Pevaryl®.

### الخلاصة

ان محلول (نترات الايكانازول) يعتبر الاكثر فعالية لاستخدام هذا الدواء في علاج جميع اشكال الفطريات الجلدية الناتجة عن العوامل المسببة لتلك الفطريات. لقد تم تحضير الدواء على شكل محلول للاستخدام الموضوعي (والذي حضر في المختبرات الصناعية لكلية الصيدلة) لقد اجريت دراسة سريرية مقارنة بين المحلول المحضر صناعيا والمستحضر التجاري بيفاريل كمستحضر قياسي فوجد ان كل منهما له نفس التأثيرات العلاجية والجانبية. كلا العلاجين أظهر فعالية في تقليل الاعراض المرضية لكن العلاج بواسطة محلول نترات الايكانازول كان اكثر فعالية. ان محلول نترات الايكانازول والمستحضر التجاري بيفاريل قد اعطي إلى 104 اشخاص كمجموع كلي يعانون من فطريات جلدية ناتجة عن العوامل المسببة لتلك الفطريات. ايضا ممكن علاج الاصابات المزمنة بصورة كبيرة باستخدام محلول نترات الايكانازول بتركيز 1% المحضر سابقا. ان محلول نترات الايكانازول والمستحضر التجاري بيفاريل قد وضعا على المنطقة المصابة من الجلد في الصباح والمساء لفترة من اسبوع إلى 16 اسبوع مع مساج خفيف على المنطقة المصابة حتى تم شفاء المنطقة المصابة.

### INTRODUCTION

Econazole nitrate is (RS)-1-[2,4-dichloro-5-(P-chlorobenzyl-oxyphenethyl)imidazole nitrate<sup>(1)</sup>.



It is a white or almost white crystalline powder. M.p. about 164°, with decomposition, very slightly soluble in water and ether: soluble 1 in 125 of ethanol (96%) 1 in 60 Of chloroform and in 25 of methanol<sup>(1,2)</sup>.

Econazole nitrate is used for the topical treatment of all forms of dermatomycosis caused by dermatophytes like trichophyton rubum, trichophyton mentagrophytes trichophyton tonsurans which cause tinea pedis, tinea cruris: and tinea corporis respectively<sup>(3)</sup>. It is used for dermatomycosis caused by yeasts like candida albicans and candida guilliermordi<sup>(4)</sup>.

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Econazole nitrate is available in a variety of dosage form such as skin cream (alone or in combination with triamcinolone), skin solution, skin lotion, vaginal suppositories and spray solution<sup>(3)</sup>.

It has been proven to be effective in the presence of mixed infection. The antibacterial effects of the preparation offer an additional advantage.

The purpose of this work is to evaluate clinically a selected formula for Econazole nitrate as topical solution prepared in our laboratory<sup>(5)</sup>.

### **SUBJECTS and METHOD**

A total of 104 patients were involved in this investigation. They were diagnosed by Dermatologist Dr. A. Al-Swdany working in medical city as having dermatomycetes caused by various dermatomycetes, blastomycetes and mould (6, 7, 8, 9, 10). The patients age ranged from 17-70 year (average 63.4 years). They were randomly divided into two groups (52 patient in each) the patients in group I, were 17 female (33%) and 35 males (67%) were instructed to use the prepared formula of econazole nitrate 1% solution. Patients in group II, were 16 females (30%) and 36 males (69%) were given the commercial of econazole nitrate 1% solution, Pevaryl® Ciliag. All patients were instructed to apply econazole nitrate twice daily with light massage on to the affected skin region. The duration of treatment was ranged from one week to 16 weeks.

### **RESULTS and DISCUSSION**

All patients involved in this study were evaluated clinically, in addition to mycological and microscopical examination before and after treatment with either the prepared formula of econazole 1% solution or Pevaryl®

### **CLINICAL EVALUATION**

The response to the treatment was graded as, cured, poor improvement and no effect<sup>(7)</sup>. The data showed that the percentage of cured, poor improvement and no effect in patients treated with econazole nitrate 1% solution (the prepared formula) were 90.3%, 7.8% and 109% respectively as shown in table -1.

**Table:1 Clinical evaluation of 52 patients taking Econazole 1% solution.**

<b>No. of patients</b>	<b>52</b>	<b>100%</b>
<b>Cured</b>	<b>47</b>	<b>90.3%</b>
<b>Poor improvement</b>	<b>4</b>	<b>7.8%</b>
<b>No effect</b>	<b>1</b>	<b>1.9%</b>

The results of patient treated with Pevaryl® solution showed that 88.4% were cured, 9.7% of poor improvement and only 1.9% with no effect as illustrated in table -2.

**Table -2 Clinical evaluation of 52 patients taking Pevaryl® as a reference.**

<b>No. of patients</b>	<b>52</b>	<b>100%</b>
<b>Cured</b>	<b>46</b>	<b>88.4%</b>
<b>Poor improvement</b>	<b>5</b>	<b>9.7%</b>
<b>No effect</b>	<b>1</b>	<b>1.9%</b>

### **MYCOLOGICAL EVALUATION**

Prior to therapy the fungus species could be demonstrated by a positive culture in 20 patients out of 52 patients treated with either the prepared formula or reference (Pevaryl®) of econazole nitrate 1% solution.

Table -3- showed that no more fungi were present in 14 patients, (70%) treated with econazole 1% solution while 6 patients could not be checked mycologically, as there were no samples available due to healing of mycosis. Mycological examination in patient treated with (Pevaryl®) showed negative fungi in 13 patient (65%) as shown in table 4.

**Table –3 Mycological evaluation of 20 patients taking Econazole 1% solution.**

No. of patients	20	100%
Fungus identification prior to the rapy + After therapy - ) Cured	14	70%
Fungus identification Prior to therapy + Aftertherapy ) cured No sample - ) ( cure)	6	30%

**Table –4 Mycological evaluation of 20 patients taking Pevaryl® as refrence.**

No. of patients	20	100%
Fungus identification prior to therapy + ) After the rapy - ) cured	13	65%
Fungus identification Prior to therapy + ) After therapy ) cured No sample - ) ( cure)	6	30%
Fungus identification prior to therapy+ ) After the rapy + ) not cured	1	5%

**MICROSCOPICAL EVALUATION**

The diagnosis was also confirmed by positive microscopical fungus identification prior to therapy in 25 patients treated with econazole 1% solution or Pevaryl®. The percentage treated with econazole 1% solution and Pevaryl® with a negative funges were 80% and 76% respectively as shown in table 5 and 6. Microscopical examination could not be performed in 4 cases (16%) treated with econazole 1% and 5 cases (20%) used Pevaryl®, since no sample were available due to healing of mycosis .

**Table –5 Microscopically results of 25 patients taking Econazole 1% solution.**

No. of patients	25	100%
Fungus identification prior to therapy + ) After therapy - ) cured	20	80%
Fungus identification Prior to therapy + ) After therapy ) cured No sample - ) ( cure)	4	16%
Fungus identification prior to the rapy+ ) After therapy + ) not cured	1	4%

Table –6 Microscopically results of 52 patients taking Pevaryl as reference.

No. of patients	25	100%
Fungus identification prior to the rapy + After therapy - } cured	19	76%
Fungus identification Prior to therapy + After therapy - } cured No sample - } ( cure)	5	20%
Fungus identification prior to the rapy + After therapy + } not cured	1	4%

### Therapeutic Results In Chronic Cases:

12 patients of 52 patients who suffered from chronic mycosis ( duration 1-5 years ) were treated prepared formula of econazole the data that 11 patients ( 91.7 ) were cured after treatment with average duration of (2-16) weeks and only one patient (8.3 ) was not respond as shown in table7.

Table –7 Therapeutic results in 12 patients with chronic mycosis lasting for more than

Pat. No	Duration of disease in months	Duration of treatment in weeks	Cured	Not cured
1	12	2	+	
2	12	11	+	
3	14	2	+	
4	24	2	+	
5	13	3.5	+	
6	12	2		+
7	60	14.5	+	
8	16	16	+	
9	14	2	+	
10	12	9	+	
11	12	2	+	
12	30	5.5		
12 pat.	1- 5 years	2- 16 weeks	11 pat. 95%	1 pat. 8.3%

one year.

The appearance of any side effect after the treatment with both formulas was also monitored burning and pruritis (11,12,13,14,15 ) were observed in only 3 patients treated with econazole 1% solution (out of 52 patients

### CONCLUSION

The results of this clinical investigation clearly indicated that the prepared of econazole nitrate 1% was effective as compared to that of commercial brand Pevaryl®.

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