

## Topical 20% Zinc Sulphate Solution in the Treatment of Tenia Corporis

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### Abstract

Tenia corporis is still a very common disease among Iraqi people with so many systemic and topical treatment. To evaluate the therapeutic efficacy of zinc sulphate solution in the treatment of tenia corporis. Forty five patients completed the study in Tikrit teaching hospital, patients were divided in to two groups; Group A: thirty patients treated with topical zinc sulphate 20% Solution applied twice daily for two weeks, Group B: fifteen patients treated with topical distill water and used as a control group. All patients were examined clinically and microbiologically before treatment and after the 1<sup>st</sup> week and 2<sup>nd</sup> of treatment. Group A, patients showed a clinical cure after the 1<sup>st</sup> week of treatment while the microbiological cure obtained after the 2<sup>nd</sup> week of treatment, and only few patients complained of mild irritation in the first few days of treatment. Group B patients didn't show neither clinical nor microbiological cure. So topical 20% zinc sulphate solution is effective in the treatment of tenia corporis with negligible side effects.

### محلول كبريتات الخارصين الموضعي 20% في علاج سعفة الجلد

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#### المستخلص

سعفة الجلد لا تزال من الأمراض الشائعة بين العراقيين مع الكثير من العلاجات الموضعية و الجهازية. لغرض تقييم الفعالية العلاجية لكبريتات الخارصين في علاج سعفة الجلد. أكمل 45 مريضا الدراسة في مستشفى تكريت التعليمي، وقسم المرضى إلى مجموعتين: المجموعة أ 30 مريضا عولجوا موضعيا بمحلول كبريتات الخارصين بتركيز 20% مرتان يوميا لمدة أسبوعين. المجموعة ب 15 مريضا عولجوا بالماء المقطر كمجموعة سيطرة. كل المرضى فحصوا سريريا و مايكروبايولوجيا قبل العلاج و بعد أسبوع و أسبوعين من العلاج. مرضى المجموعة أ اظهروا شفاء سريريا ولكن الشفاء مايكروبايولوجي ظهر بعد أسبوعين من العلاج، وعدد قليل من المرضى اشتكوا من تهيج بسيط في الأيام الأولى من العلاج. المجموعة ب لم يظهروا أي استشفاء سريري أو مختبري . إن محلول كبريتات الخارصين الموضعي 20% علاج ناجح ورخيص لسعفة الجلد و بآثار جانبية قليلة جدا.

## Introduction

Dermatophytes are related fungi capable of causing skin changes known as ringworm, dermatophytosis or tinea<sup>(1-2)</sup>. Ringworm are all mould belonging to three asexual genera, *Microsporium*, *Trichophyton*, and *Epidermophyton*<sup>(3)</sup>. Tinea corporis is a dermatophyte infection of the glabrous skin<sup>(4)</sup>. Tinea corporis may be caused by any of the dermatophytes, but it caused mainly by *Microsporium Canis*, *Trichophyton mentagrophytes*, and *Trichophyton rubrum*<sup>(5)</sup>. The characteristic lesions are circular, usually sharply margined with a raised edge, single or multiple<sup>(6)</sup>. Its diagnosis depends on the clinical picture of the disease and the laboratory tests which includes: direct microscopic examination of the scale with microscope after it mounted with 15% KOH, and culture by using a special media "sabourauds dextrose agar" or dermatophytes test media<sup>(7,8,9)</sup>. Dermatophytes is an infection restricted to epithelial tissue and not penetrate deeply, so it's treatment is mainly topical by using special topical antifungal drugs like azoles group, and systemic antifungal therapy may be used for some conditions<sup>(10)</sup>. Zinc is one of essential trace elements, has so many roles in the treatment of skin conditions as it has astringent and antiperspirant properties<sup>(11,12)</sup>. Zinc sulphate accelerate wound healing and it is very well known immunomodulator<sup>(13)</sup>. Zinc sulphate used in treatment of many skin diseases; cutaneous leishmaniasis, pityriasis versicolour, viral warts, rosacea, etc..<sup>(14,15,16,17)</sup>.

## Patients and Methods

A double blind clinical trial done on fifty patients, with tinea corporis (untreated single lesions included in the study), in

the departments of dermatology and pediatric in Tikrit teaching hospital in a period of six months. Patients allocated randomly to group A: 35 patients treated with 20% zinc sulphate solution, group B: 15 patients treated with distilled water (placebo) and used as a negative control, the cases and controls were matched for sex and age. A detailed history was conducted regarding: age, disease duration, family history, history of animal contact, and physical examination include: size, border activity, scale and also microscopic examination of the scale. Clinical and microbiological examination done at the 1<sup>st</sup> visit then weekly after using the treatment. Zinc sulphate solution prepared by adding 100 cc distilled water to 20 gm of zinc sulphate powder, to be applied this solution twice daily for two weeks. At the baseline (week 0), after a (week 1), and (week 2) the patients were assessed clinically and microbiologically and the results were recorded.

## Results

A total of fifty patients suffer from Tinea Corporis attending the dermatological and pediatric outpatient departments in Tikrit Teaching Hospital were included in the study, whom 34 males 68 % and 16 females 32% . their ages ranged between 12-63 years with the mean age  $27.85 \pm SD 12.35$  years and the duration of the disease ranged between 1-2 weeks. The efficacy parameters were: the 1<sup>st</sup> parameter was the clinical cure while the 2<sup>nd</sup> parameter was the mycological cure. The clinical response was noticed after the 1<sup>st</sup> week of treatment by measuring the size of the lesion whether is the same or decrease, the scale, erythema and border activity were all diminished and by the end of the 2<sup>nd</sup> week complete cure was achieved.

Table(1): Clinical evaluation of improvement

Clinical feature	Before treatment	End of 1 <sup>st</sup> week of treatment	The end of 2 <sup>nd</sup> week of treatment
Itching	± ve	-ve	-ve
Scale	+++	+	-ve
Erythema	+++	+	-ve
Border activity	+++	+	-ve
Size		Same or decrease	decrease

Mycological cure: after KOH examination in the 1<sup>st</sup> visit lesions show numerous hyphae and spores. After the 1<sup>st</sup> week of treatment the hyphae was positive but very scanty and macerated while the spore was still positive but few. After the 2<sup>nd</sup> week of treatment, the hyphae was negative but the spores were

very few only in few lesions while most of them were negative (as shown in table 2). In group B patients, because of absence of any response after the 1<sup>st</sup> week of treatment distill water treatment was stopped, and patients started on antifungal therapy.

Table(2): Mycological cure.

	Before treatment	End of 1 <sup>st</sup> week of treatment	The end of 2 <sup>nd</sup> week of treatment
hyphae	++++	± macerated	-ve
spores	+++	++	±

### Discussion

Tinea of the glabrous skin is a superficial Dermatyophyte infection of the skin of the trunk and extremities characterized by inflammatory lesions<sup>(18)</sup>. Dermatyophyte preferentially inhabit the non-living cornified layers of the skin, hair and the nails, and generally do not invade below the surface of the epidermis or it's appendages<sup>(19)</sup>. As topical zinc sulphate solution successfully used in the treatment of acne in different diseases<sup>(14,15,16,17)</sup>. So this brought the idea to use topical zinc sulphate solution in a concentration of 20% as a topical treatment of tinea corporis. Single, previously untreated lesions were selected to be treated with topical zinc sulphate solution to avoid lesions modified by any other kind of

treatment. There was decrease in the scaleness of the lesion in the 1<sup>st</sup> week of treatment, that indicate keratolytic effect, and the decrease in the erythema by the end of the 2<sup>nd</sup> week might indicate anti-inflammatory effect of topical zinc sulphate. The decrease in the border activity, decrease in the size of the lesions, and decrease in the erythema and absence of the scale might lead us to clinical cure of the disease. While it may be due to keratolytic and anti-inflammatory effect beside the antifungal activity of topical zinc sulphate. Clinical cure was confirmed by complete absence of the hyphae on KOH examination of the scale, that prove the effectiveness of topical zinc sulphate treatment. In some lesions, some spores were found by KOH examination which require

extention of treatment to three or four weeks to get complete disappearance of spores in the lesions. The antifungal activity of zinc sulphate solution might be as the direct effect on the fungi or through it's immunomodulatory effect. Therefore, topical zinc sulphate 20% is an effective cheap antifungal drug for simple, single not modified tinea corporis with negligible side effects.

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