

## Treatment of Primary and Secondary Infections of the Skin with Cetyltrimethylammonium Bromide

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**Cetyltrimethylammonium bromide incorporated in an aromatic mix base is effective in the treatment of primary and secondary pyogenic cutaneous infections. The failure of this preparation to produce allergic reactions suggests a low sensitizing index.**

**I**N THIS investigation cetyltrimethylammonium bromide (CETAB) incorporated in a water soluble base containing an aromatic mix<sup>1</sup> was found to be effective antimicrobial agent in the treatment of primary skin infections. It has also been found to be effective in the elimination of complicating secondary infections of various skin conditions thus permitting proper treatment of the primary condition.

### METHODS AND TECHNIQUES

This study was conducted in the out-patient dermatological clinic of a large mid-western county hospital and is based on observations made on 100 patients treated for superficial pyodermic infections of the skin with a cream containing CETAB and an aromatic mix.

In this series there were 21 white male subjects; 38 male colored subjects; 9 white female subjects and 32 colored female subjects. The youngest patient treated was a 2-year old colored female child and the oldest a 79-year old white female patient.

Treatment consisted of having the subjects apply the medication to the involved areas at least twice daily. In the more severe cases it was applied as often as three or four times daily. Although a few cases were treated shortly after the onset of the disease, less than 1 week, the majority of cases were subacute or chronic and had been present for 2 weeks to 6 months or longer. As a result, many of the cases presented disseminated lesions.

There were 75 subjects who presented six different types of primary skin infections and 25 subjects who presented secondary infections complicating 10 different types of common dermatological disorders. The diagnosis, order of frequency, and results are listed in Table I. The period of treatment in the majority of cases was 7 days, although several cases were treated for 2 weeks, and in a few cases, therapy was continued for 1 month. All clinical evaluations were made at the end of 1 week, regardless of the duration of treatment, in order to maintain the evaluation of the therapeutic index as constant as possible.

Cultures were taken from the lesions of 14 patients selected at random by the dry swab technique. These were transported within a short time (1-2 hr.) to the bacteriological laboratory where they were transferred to blood-agar plates and incubated for

48 to 72 hours. The organisms were then identified and reported by the director of the laboratory.

Of 75 patients treated for primary skin infections, 53 (70.6%) obtained satisfactory results (estimated improvement 50% or better), 15 (20%) obtained fair results (estimated improvement 25% to 50%) while 7 failed to obtain any benefit from therapy.

In those patients treated for dermatological conditions complicated by secondary infection 15 patients (60%) obtained satisfactory results while 10 patients obtained only partial benefit from this form of therapy.

**Culture.**—An analysis of the cultures revealed that hemolytic *Staphylococcus aureus coagulase positive* was obtained as the only infecting microorganism in six cases and that both it and hemolytic *Staphylococcus albus* were present in five cases. The culture in one case of folliculitis of the scalp revealed a neisseria organism along with an unidentified yeast, while in two cases no growth was reported initially. One of these two cases failed to show growth on repeated culture.

Of the six patients from whom only hemolytic *Staphylococcus aureus coagulase positive* was recovered, four obtained good results and two obtained fair results from the treatment with CETAB cream.

In those cases in which both hemolytic *Staphylococcus aureus coagulase positive* and hemolytic *Staphylococcus albus* were recovered, three patients obtained good results, one patient fair results while one patient failed to obtain any benefit from therapy. The one case in which the neisseria organism and yeast were recovered obtained an excellent result from treatment. In the two cases with negative findings, one obtained excellent results from therapy and the other only fair results.

**Reactions.**—No clinical evidence of allergic or primary irritant reactions were noted in any of the cases treated for primary skin infections or secondary infections complicating pre-existing dermatological conditions where active treatment was indicated. In several cases, patients complained of a slight transient burning sensation when the medication was first applied. This burning sensation usually disappeared in a matter of seconds and in no instance interfered with the continuation of treatment or affected clinical results. These results suggest that CETAB cream when used properly and in indicated conditions<sup>2</sup> has a low sensitizing and irritant index.

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<sup>1</sup> Furnished as Bactine cream, Miles Laboratories, Inc., Elkhart, Ind.

<sup>2</sup> Like all antimicrobial agents, CETAB cream will produce irritation when applied to those cases which are complicated by superimposed acute dermatitis venenata, regardless of cause, and when such active treatment is contraindicated.

TABLE I.—RESULTS OF THERAPY

Diagnosis	No. Cases	Excellent	Good	Fair	No Change
<b>Primary Skin Infections</b>					
Pyoderma	25	4	12	5	4
Infectious eczematoid dermatitis	20	3	11	4	2
Impetigo	13	8	4	1	...
Folliculitis	9	5	2	2	...
Ecthyma	4	1	1	2	...
Sycosis barbae	4	...	2	1	1
Total	75	21	32	15	7
<b>Secondary Infected Dermatoses</b>					
Herpes simplex	6	4	2	...	...
Contact dermatitis	4	1	2	1	...
Atopic dermatitis	3	...	2	1	...
Stasis dermatitis & ulcer	3	...	1	2	...
Tinea pedis	3	1	1	1	...
Tinea capitis	2	...	1	1	...
Seborrheic dermatitis	1	...	...	1	...
Lichen simplex chronicus	1	...	...	1	...
Pediculosis corporis	1	...	...	1	...
Pustular dermatitis-palm	1	...	...	1	...
Total	25	6	9	10	...

## DISCUSSION

A comparison of the results of treatment in those subjects treated for primary skin infections involving the uppermost skin structure such as the epidermis and the upper portion of the dermis for example, impetigo, pyoderma, infectious eczematoid dermatitis and folliculitis, to those involving the deeper portion of the dermis, for example, ecthyma or sycosis barbae, revealed the following interesting results. In the former group 49 patients out of a total of 67 patients, or 73.1%, obtained satisfactory results whereas in the latter group only four patients out of a total of eight, or 50%, obtained satisfactory results. This observation suggests that CETAB cream will be most effective in the treatment of those cutaneous infections involving the more superficial structure of the skin.

In the majority of cases treated for secondary infection of preexisting dermatoses, treatment with CETAB cream for 1 week produced sufficient improvement of this complication to allow proper dermatological therapy for the underlying skin condition. This was of particular importance where

adequate control of the micro-organism was necessary prior to institution of topical steroid therapy.

## SUMMARY

The quaternary ammonium compound cetyltrimethylammonium bromide incorporated in a water soluble aromatic mix base as a cream is an effective antimicrobial agent in the treatment of primary and secondary types of skin infections.

Treatment of patients with primary skin infection produced satisfactory results in 71% of the cases treated. Treatment of patients with secondary type skin infection produced satisfactory results in 60% of the cases treated and permitted indicated therapy of underlying dermatoses, in the majority of cases within one week.

CETAB cream is effective against cutaneous pyogenic infections produced either by hemolytic *Staphylococcus aureus coagulase positive* organisms or in combination with hemolytic *Staphylococcus albus*.

The failure of this preparation to produce allergic or irritant reactions, when used in indicated conditions, indicates a low sensitizing and irritant index.

Isolation of Polyporic Acid from *Lopharia papyracea*

By V. JIRAWONGSE, E. RAMSTAD, and J. WOLINSKY

IN RECENT years a mushroom known as Hed Dchig (hed, mushroom; dchig, tummy wood) or Hed Tin Tükgae (Tin, foot; tükgae, gecko) has come into use in folk medicine in northeastern Thailand as an anthelmintic and is claimed to be effective, especially in the treatment of tapeworm infestations. The mushroom grows on *Careya arborea* Roxb. (*Mytaceae*) and is used as a food. It may be found in local drugstores in Udorn City.

Hed Dchig has been identified as *Lopharia papyracea* (Jungb.) Reid, belonging to the family of *Hydnaceae*.

Having available a small supply of the dried mushroom<sup>1</sup> we subjected it to chemical investigation and found it to contain 11.4% of polyporic acid, a compound we found to cause contraction of isolated rabbit ileum suspended in oxygenated Tyrode solution.

## EXPERIMENTAL

**Isolation.**—The leathery tan mushroom was dried over calcium oxide (9.5% moisture), powdered, defatted with petroleum ether by extraction in a

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