



Q/ What is the best treatment for impetigo?

EVIDENCE-BASED ANSWER

A/ ALTHOUGH EVIDENCE IS LACKING to support a single best treatment for impetigo, topical mupirocin, fusidic acid, gentamicin, and retapamulin are all at least 20% more likely than placebo to produce cure or improvement (strength of recommendation [SOR]: **A**, meta-analysis of randomized controlled tri-

als [RCTs] and a single RCT of retapamulin).

Topical bacitracin and fusidic acid are 15% more likely than disinfectant solutions to cure or improve impetigo (SOR: **A**, systematic review of RCTs).

Oral antibiotics may be as effective as topical antibiotics (SOR: **B**, RCTs with different results).

Evidence summary

Most data on the effectiveness of topical antibiotics focus on bacitracin, fusidic acid (not available in the United States), and mupirocin. Retapamulin 1% ointment, a topical antibiotic in the pleuromutilin class, is approved by the US Food and Drug Administration (FDA) for use in adults and children older than 9 months to treat impetigo caused by methicillin-susceptible *Staphylococcus aureus* and *Streptococcus pyogenes*.¹

Topical antibiotics outperform placebo

A 2003 meta-analysis of 16 studies (1944 patients) evaluated treatments for impetigo in both adults and children.² Investigators conducted most of the studies in outpatient settings in the United States, United Kingdom, Northern Europe, and Canada. They expressed outcomes in terms of cure or clinical improvement within 7 to 14 days of starting treatment.

Topical agents, including mupirocin, fusidic acid, and gentamicin, resulted in cure or improvement in more patients at 7 to 14 days than placebo (absolute benefit increase=20%; number needed to treat [NNT]=5; 95% confidence interval [CI], 1.49-4.86). Definitions of cure or improvement varied among the included studies, however.

A 2012 Cochrane review of various interventions included 68 RCTs with a total of 5708 participants, primarily from pediatric or dermatology hospital outpatient clinics in North America and Europe.³ Clinical cure (defined as clearance of crusts, blisters, and redness as determined by investigators) or improvement at one week were the primary outcomes (TABLE).^{3,4} Mupirocin (relative risk [RR]=2.21; 95% CI, 1.16-3.13), fusidic acid (RR=4.42; 95% CI, 2.39-8.17), and retapamulin (RR=1.64; 95% CI, 1.30-2.07) all demonstrated higher rates of cure or improvement than placebo.

Retapamulin produces greater clinical response than placebo in an RCT

A 2008 randomized, double-blind, multicenter, industry-funded, placebo-controlled trial of 213 patients evaluated the effectiveness of retapamulin to treat uncomplicated impetigo with an outcome of clinical response at 7 days.⁴ Clinical response was defined as total absence of lesions, drying of treated lesions without crusts or erythema, decrease in the size of the affected area or decrease in the number of lesions. Retapamulin ointment produced a higher rate of clinical response than placebo (absolute risk reduction=33.5%; 95% CI, 20.5-46.5; NNT=3, *P*<.001).

CONTINUED

Jae Shim, MD; Jeffrey Lanier, MD

Martin Army Community Hospital, Fort Benning, Ga

Maylene (Kefeng) Qui, MLIS

Biomedical Library, University of Pennsylvania, Philadelphia

ASSISTANT EDITOR

Paul Crawford, MD

Nellis Family Medicine Residency, Nellis Air Force Base, Nev

The opinions and assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the US Army or the Department of Defense.

CLINICAL INQUIRIES

TABLE

How well do impetigo treatments work?^{3,4}

Comparison	Number of patients	ARR for cure or improvement	NNT	Cost of treatment*
Topical antibiotics vs placebo	575	41.2%	2	
Retapamulin vs placebo	213	33.5%	3	Retapamulin 1% ointment (15 g): \$130.12
Topical antibiotics vs disinfectant solution	292	11.4%	9	
Mupirocin vs fusidic acid	440	NS	NS	Mupirocin ointment 2% (22 g): \$42.75 Fusidic acid is not available in the United States
Mupirocin vs oral erythromycin	581	5.1%	20	Erythromycin 100 tabs: \$295.01 (250 mg), \$314.23 (333 mg), \$338.93 (500 mg) Erythromycin ethylsuccinate solution (100 mL): \$170.50 (200 mg/5 mL), \$218.14 (400 mg/5 mL)
Mupirocin vs dicloxacillin	53	NS	NS	Dicloxacillin 100 tabs (250 mg): \$66
Mupirocin vs ampicillin	13	NS	NS	Ampicillin 100 tabs (500 mg): \$39.88 Ampicillin suspension 100 mL: \$9.54 (125 mg/5 mL), \$14.08 (250 mg/5 mL)
Bacitracin vs oral erythromycin	30	NS	NS	Bacitracin ointment 500 units/g (28.4 g): \$3.47
Bacitracin vs penicillin	34	NS	NS	Penicillin V oral 100 tabs (500 mg): \$77.77 Penicillin V suspension 100 mL: \$3.84 (125 mg/5 mL), \$4.31 (250 mg/5 mL)
Cephalexin vs bacitracin	19	56.7%	2	Cephalexin 100 tabs (500 mg): \$526.13 Cephalexin oral suspension 100 mL: \$8.93 (125 mg/5 mL), \$18.90 (250 mg/5 mL)
Erythromycin vs penicillin	79	22.4%	4	See above
Cloxacillin vs penicillin	166	35.9%	3	Cloxacillin is not available in the United States

ARR, absolute risk reduction; NNT, number needed to treat; NS, not significant.

*Cost data obtained from Medi-Span at www.uptodate.com. Accessed December 5, 2013.

Topical antibiotics work slightly better than disinfectant solutions

In a pooled analysis from the 2012 Cochrane review, topical bacitracin and fusidic acid demonstrated slightly higher rates of cure or improvement than disinfectant solutions (RR=1.15; 95% CI, 1.01-1.32).³

Oral antibiotics may work as well as, or better than, topicals

The 2012 Cochrane review found better rates of cure or improvement for topical mupirocin than oral erythromycin (RR=1.07; 95% CI, 1.01-1.13).³ Investigators noted no significant differences between topical mupirocin and bacitracin and oral antibiotics other than erythromycin, although in one small study (10 patients), oral cephalexin resulted in a higher rate of cure or improvement than topical bacitracin (absolute risk reduction [ARR]=56.7%; NNT=2).

Studies comparing oral antibiotics found that both erythromycin and cloxacillin (not available in the United States) produced higher rates of cure or improvement than penicillin (erythromycin, RR=1.29; 95% CI, 1.07-1.56; cloxacillin, RR=1.14; 95% CI, 0.80-1.62).

Recommendations

The Infectious Diseases Society of America recommends topical mupirocin as first-line therapy for impetigo, although resistance to the drug exists. Patients with numerous lesions or who fail to respond to topical treatment should be treated with oral antibiotics active against *S pyogenes* and *S aureus*. Recommended oral antibiotics include dicloxacillin, amoxicillin/clavulanate, cephalexin, erythromycin, and clindamycin.⁵

JFP

References

1. Altanax. Med Library Web site. Available at: <http://medlibrary.org/lib/rx/meds/altanax-3/>. Accessed May 12, 2014.
2. George A, Rubin G. A systematic review and meta-analysis of treatments for impetigo. *Br J Gen Practice*. 2003;53:480-487.
3. Koning S, van der Sande R, Verhagen AP, et al. Interventions for impetigo. *Cochrane Database Syst Rev*. 2012;1:CD003261.
4. Koning S, van der Wouden JC, Chosidow O, et al. Efficacy and

safety of retapamulin ointment as treatment of impetigo: randomized double-blind multicentre placebo-controlled trial. *Br J Dermatol*. 2008;158:1077-1082.

5. Stevens DL, Bisno AL, Chambers HF, et al; Infectious Diseases Society of America. Practice guidelines for diagnosis and management of skin and soft-tissue infections. *Clin Infect Dis*. 2005;41:1373-1406.

NEW WEEKLY QUIZZES!



Build your knowledge through 5-question quizzes from **The Journal of Family Practice!**

Each week a new quiz
on a topic related to the field of
family medicine will be posted.
Take as many quizzes as you want—
they're all free.

Challenge yourself further by taking
quizzes in other specialties!



www.jfponline.com/md-iq-quizzes.html