Use of topical antibiotics as prophylaxis in clean dermatologic procedures

Michelle M. Levender, MD,[a] Scott A. Davis, MA,[a] Shawn G. Kwatra, BS,[a] Phillip M. Williford, MD,[a] and Steven R. Feldman, MD, PhD[a,b,c]
Winston-Salem, North Carolina

Background: Topical antibiotics are not indicated for routine postoperative care in clean dermatologic procedures, but may be widely used.

Objective: We sought to describe topical antibiotic use in clean dermatologic surgical procedures in the United States.

Methods: The 1993 to 2007 National Ambulatory Medical Care Survey database was queried for visits in which clean dermatologic surgery was performed. We analyzed provider specialty, use of topical antibiotics, and associated diagnoses. Use of topical antibiotic over time was analyzed by linear regression.

Results: An estimated 212 million clean dermatologic procedures were performed between 1993 and 2007; topical antibiotics were reported in approximately 10.6 million (5.0%) procedures. Dermatologists were responsible for 63.3% of dermatologic surgery procedures and reported use of topical antibiotic prophylaxis in 8.0 million (6.0%). Dermatologists were more likely to use topical antibiotic prophylaxis than nondermatologists (6.0% vs 3.5%). Use of topical antibiotic prophylaxis decreased over time.

Limitations: Data were limited to outpatient procedures. The assumption was made that when topical antibiotics were documented at procedure visits they were being used as prophylaxis.

Conclusions: Topical antibiotics continue to be used as prophylaxis in clean dermatologic procedures, despite being ineffective for this purpose and posing a risk to patients. Although topical antibiotic use is decreasing, prophylactic use should be eliminated. (J Am Acad Dermatol 2012;66:445-51.)

Key words: allergic contact dermatitis; antibiotic ointment; class I wound; clean wound; dermatologic surgery; postoperative care; surgical prophylaxis; surgical site infection; surgical site infection prophylaxis; wound healing; wound infection.

The practice of using prophylactic antibiotics in surgical procedures has received considerable study across many fields. In dermatology, there is a role for both oral and topical antibiotics as prophylaxis. Oral antibiotics are primarily indicated for prophylaxis of infective endocarditis and prosthetic joint infections.[1-5] Oral

Abbreviations used:

ACD:	allergic contact dermatitis
ICD-9:	*International Classification of Diseases, Ninth Revision*
NAMCS:	National Ambulatory Medical Care Survey
SSI:	surgical site infections

From the Center for Dermatology Research, Departments of Dermatology,[a] Pathology,[b] and Public Health Sciences,[c] Wake Forest University School of Medicine.

The Center for Dermatology Research is supported by an educational grant from Galderma Laboratories LP. This study was also supported by a grant from Glaxo-Smith-Kline. Dr Feldman has received research, speaking, and/or consulting support from Galderma, Abbott Labs, Warner Chilcott, Aventis Pharmaceuticals, 3M, Connetics, Roche, Amgen, Biogen, and Genentech. Dr Levender, Mr Davis, Mr Kwatra, and Dr Williford have no conflicts to disclose.

Accepted for publication February 2, 2011.

Reprint requests: Michelle M. Levender, MD, Department of Dermatology, Wake Forest University School of Medicine, Medical Center Blvd, Winston-Salem, NC 27157-1071. E-mail: mlevende@wfubmc.edu.

Published online August 8, 2011.
0190-9622/$36.00

doi:10.1016/j.jaad.2011.02.005

antibiotics may also be indicated for prophylaxis of postoperative surgical site infections (SSI). To determine this, wounds must first be classified using the 1985 Centers for Disease Control and Prevention surgical wound stratification guidelines (Table I). The majority of dermatologic surgical procedures fall into the category of clean (class I) procedures.[5-7] Postoperative SSI rates in dermatologic surgeries are very low, ranging from 1% to 3% in most studies.[2,8-12] Among clean (class I) and clean-contaminated (class II) wounds, oral antibiotic prophylaxis is only indicated in certain situations in which there is significantly increased risk of wound infection or when infection carries great morbidity. This may include procedures on patients with poorly controlled diabetes, immunosuppression, or extensive inflammatory disease, and procedures in the groin area or below the knee and all wedge excisions of the lip or ear, skin grafting, and skin flaps on the nose.[1-4] In contaminated (class III) and infected (class IV) wounds, oral and topical antibiotic prophylaxis for SSI is indicated.[1-4]

CAPSULE SUMMARY

- Topical antibiotics are not indicated for prophylactic use in clean dermatologic procedures. Unnecessary use of these common contact allergens represents significant cost to the US health care system and may contribute to antibiotic resistance.
- A significant minority of providers, the majority of whom are dermatologists, continue to use topical antibiotics in postoperative care of clean surgical wounds.
- For routine postoperative care of clean surgical wounds petrolatum is recommended in place of topical antibiotics.

Although there may be a role for oral antibiotics as prophylaxis for SSI in certain clean and clean-contaminated dermatologic surgery, as described above, there is no place for topical antibiotic use as prophylaxis in these procedures. In early animal and human studies, there was evidence that use of topical antibiotics on surgical wounds decreased rates of infection.[13-15] However, wound infection rates in these studies were much higher than current rates, limiting the generalizability of these early data. Since then, there have been a number of studies that have found that topical antibiotic use does not lower wound infection rates in clean skin surgery.[16-20]

In a landmark study, Smack et al[18] randomized 922 patients with 1249 wounds undergoing dermatologic outpatient surgery between December 1993 and September 1994 to postoperative wound care with bacitracin or white petrolatum. They found no significant difference between postoperative wound infection rates between groups (infection rates: 0.9% in bacitracin group and 2.0% in petrolatum group). Similarly in 2005, Campbell et al[19] randomized 142 patients undergoing Mohs micrographic auricular surgery, creating 147 surgical wounds, to receive either topical gentamycin or white petrolatum. There was no significant difference in infection rates between the two groups. In 2006, an Australian study randomized 778 patients with 1801 clean dermatologic surgical wounds to receive no ointment, paraffin ointment, or mupirocin ointment postoperatively. They too found no significant difference in infection rates between groups (infection rates: 1.4% in no ointment group, 1.6% in paraffin ointment group, and 2.3% in mupirocin group).[20] Based on these studies, the routine use of antibiotic ointments is not indicated in clean dermatologic surgeries.[8,9,21] We sought to characterize topical antibiotic use in clean dermatologic surgical procedures in the United States, using data from the National Ambulatory Medical Care Survey (NAMCS).

METHODS

The National Center for Health Statistics conducts the NAMCS as an ongoing collection of data on ambulatory medical care services. The sampling is limited to nonfederally employed physicians providing primarily outpatient services in the United States. For each year of data, the multistage probability sampling design is stratified by primary sampling unit (county, contiguous counties, or standard metropolitan statistical area), then by physician practices within the sampling unit, and, finally, by patient visit within the 52 weekly randomized periods. For each visit sampled, a patient log was completed by the physician provider, including data on demographics, reason for visit, diagnoses, and procedures performed, among others. Sampling weights were then applied to sample data to project national estimates describing outpatient services in the United States.[22,23]

In 1993, NAMCS began including more comprehensive data on outpatient surgical services.[22] For the current study, to assess the use of topical antibiotics in clean dermatologic procedures, the NAMCS database was queried for all visits from 1993 through 2007 that coded for a clean dermatologic procedure (Appendix 1; available at http://www.eblue.org). Procedures were identified through a search of the *International Classification of Diseases, Ninth Revision* (*ICD-9*) for all procedure codes that related