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Authors
Stiff, KM
Glines, KR
Muse, ME
et al.

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Gentian violet for pyoderma gangrenosum: a retrospective chart review

KM Stiff[1] MD, KR Glines[1] DO, ME Muse[1] DO, A Cline[1] MD PhD, SR Feldman[1-3] MD PhD JL Jorizzo[1,4] MD, and WW Huang[1] MD MPH

Affiliations: [1]Center for Dermatology Research, Department of Dermatology, Wake Forest School of Medicine, Winston-Salem, North Carolina, USA, [2]Department of Pathology, Wake Forest School of Medicine, Winston-Salem, North Carolina, USA, [3]Department of Social Sciences & Health Policy, Wake Forest School of Medicine, Winston-Salem, North Carolina, USA, [4]Department of Dermatology, Weill Cornell Medical College, New York, New York, USA

Corresponding Author: Katherine M. Stiff, MD, 1 Medical Center Boulevard, Winston-Salem, NC 27157-1071, Tel: 330-831-0240, Email: katherinestiff@gmail.com

Abstract

Pyoderma gangrenosum is a rare autoinflammatory skin disease. Treatment is multifactorial, addressing inflammation, pain, underlying disease, if present, and the wound. Gentian violet has been used for hundreds of years in a variety of dermatologic conditions for its anti-inflammatory properties. This study aims to evaluate gentian violet in wound healing for pyoderma gangrenosum. We conducted a retrospective chart review of patients with pyoderma gangrenosum treated with gentian violet at the Wake Forest School of Medicine Department of Dermatology in the last 10 years. The primary outcome was clinical improvement. Of the 34 cases that met inclusion criteria, 70% improved with gentian violet, 24% had no documented change, 3% initially improved then worsened, and 3% had unclear results. Gentian violet is a safe and cheap treatment that may improve resolution of pyoderma gangrenosum lesions in addition to systemic therapy.

Keywords: pyoderma gangrenosum, gentian violet

Introduction

Pyoderma gangrenosum is a rare autoinflamma-tory ulcerative skin disease, affecting 2-10 people per million per year [1]. It presents as a painful deep ulceration with an irregular violaceous border most commonly located on the lower extremities [2]. There is no standard treatment for this neutrophilic dermatosis. Treatment addresses the underlying disease, inflammation, pain control, and wound management [1]. Management of the inflammatory nature of the disease has been studied extensively, although evidence for the optimal wound care regimen is lacking. This study examines the use of gentian violet for wound care as an adjuvant to systemic treatment for pyoderma gangrenosum.

Methods

This retrospective chart review was approved by the Wake Forest Baptist Health institutional review board. Inclusion criteria consisted of patients over the age of 18 years diagnosed with pyoderma gangrenosum and treated with gentian violet at the Wake Forest School of Medicine Department of Dermatology between August 2008 and August 2018. The wound care regimen involved applying 2% gentian violet without any dilutions to the affected area with a cotton ball or Q-tip once a week, covering with petrolatum jelly gauze, then wrapping with an Unna boot or Coban. Systemic therapy was not routinely altered when gentian violet was added to the wound care regimen. The primary outcome was documented clinical improvement. Additional data collected included anatomic location of pyoderma gangrenosum, concurrent or previous systemic therapy, antibiotic use, and number of gentian violet treatments. Demographic data collected included age and sex. Exclusion criteria included patients without pyoderma gangrenosum, patients not treated with gentian violet, and patients with less than two visits.

Results

Thirty-one patients met inclusion criteria, with 34 total cases, defined as separate locations to which gentian violet was applied and response to treatment was monitored. The average patient age was 56 years. Seventy-one percent of patients were female. All patients had ulcers on the lower extremities; one patient also had pyoderma gangrenosum on her arm and abdomen (**Table 1**). Seventy percent of the pyoderma gangrenosum cases improved upon follow-up, 24% did not improve, 3% initially improved then worsened, and 3% had unclear results. The average number of gentian violet treatments was 8, ranging from one to >50. All the patients were also prescribed systemic treatment. The most common systemic therapies used were prednisone (87%) and methotrexate (52%). Fifty-two percent of patients took antibiotics at some point throughout the course of treatment. There were no adverse effects reported with the use of gentian violet.

Discussion

Gentian violet has been used in the treatment of dermatologic diseases since the 1800s [3]. Historically, gentian violet has been used to treat angular cheilitis, decubitus ulcers, impetigo, infectious erosions, methicillin-resistant *Staphylococcus aureus* nasal carriage, paronychia, thrush, and umbilical infections [4]. It has analgesic effects, improves wound healing, and has no documented adverse reactions [5].

The definition of improvement was not clearly stated in the medical records. We hypothesize that the lack of documented improvement in 24% of cases was related to a lack of reduction in wound size, but that the inflammation at the border had likely decreased, leading to a positive Gulliver sign, or transition from the inflammatory to healing stages of pyoderma gangrenosum [6]. This highlights the need for a standardized, validated measure of pyoderma gangrenosum severity that can be monitored throughout treatment. Another limitation of this study is that patients were not randomized to gentian violet or control.

Conclusion

Patients and physicians seem to appreciate that this topical treatment is low risk, safe, widely available, and inexpensive. A 2% solution of gentian violet costs $0.16 per milliliter [3]. The lack of any detectable adverse effects in our study, along with the low cost and ease of use, suggest that gentian violet may be beneficial to use as adjuvant to systemic therapy in order to improve wound healing in patients with pyoderma gangrenosum.

Potential conflicts of interest

The authors declare the following potential conflicts of interest. SR Feldman has received research, speaking and/or consulting support from a variety of companies including Galderma, GSK/Stiefel, Almirall, Leo Pharma, Boehringer Ingelheim, Mylan, Celgene, Pfizer, Valeant, Abbvie, Samsung, Janssen, Lilly, Menlo, Merck, Novartis, Regeneron, Sanofi, Novan, Qurient, National Biological Corporation, Caremark, Advance Medical, Sun Pharma, Suncare Research, Informa, UpToDate and National Psoriasis Foundation. He is founder and majority owner of www.DrScore.com and founder and part owner of Causa Research, a company dedicated to enhancing patients' adherence to treatment. KM Stiff, KR Glines, ME Muse, Cline, and A Jorizzo have no conflicts to disclose. WW Huang has received research, speaking, and/or consulting support from a variety of sources including Genentech, Pfizer, and the Dermatology Foundation.

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Table 1. *Characteristics of patients with pyoderma gangrenosum treated with gentian violet.*

Age	Sex	Disease Duration	Location	Systemic therapy	Oral antibiotics	# of GV treatments	Improved
48	F	>5y	R leg	Pred, MTX, MMF	Minocycline	2	Yes
70	M	30y	L leg	Pred, MMF, IVIG	Cephalexin	12	No
54	F	>5y	L leg	Pred, MTX, CSA,	Ertapenem, clindamycin	11	Yes
77	F	>5y	R leg, R thigh	Pred, MMF	Cephalexin	14	Yes
62	M	>40y	L leg	Pred, methylprednisolone, CSA	None	1	No
29	M	>5y	L thigh, R foot, bilateral ankles	Pred, MTX	Vancomycin, Pip/Tazo	Thigh-1 Foot-3 Ankle-2	Yes-thigh No change-foot and ankle
62	F	>10y	R leg	Pred, MMF	Cephalexin	>50	Yes
87	F	>5y	L leg	CSA	None	1	Unclear
70	F	>5y	L leg	MTX, thalidomide	None	1	Yes
28	F	>5y	R leg	Prednisolone, Pred	TMP-SMX	1	No
54	F	2y	R leg	Pred, MTX, adalimumab, infliximab	Doxycycline	15	Yes
81	F	2y	Bilateral legs	Pred	None	4	Yes
60	M	6y	L leg	CSA	None	2	Yes
30	F	7y	L leg	Pred, adalimumab, ustekinumab, thalidomide, CSA, MTX	Ciprofloxacin, cephalexin	1	Yes
33	F	11y	L leg	Pred, MTX, dapsone, adalimumab	None	1	Yes
62	F	2y	Bilateral legs	Pred, AZA	None	4	Yes then No
72	F	3mos	L leg, R leg	Pred, MTX	Cephalexin	L leg-32 R leg-8	L leg-Yes R leg-Yes
63	F	3y	L leg	Pred, dapsone	None	36	Yes
29	F	3mos	R leg L leg	Pred	None	12	Yes
24	M	1y	R leg	Pred, MTX	None	1	Yes
54	F	20y	L leg	Pred, dapsone	Ciprofloxacin, doxycycline	5	Yes
60	F	2y	L leg	Pred, dapsone, MTX, MMF, thalidomide, CSA	None	8	Yes
58	M	1y	Bilateral legs	Pred, thalidomide, IVIG	TMP-SMX	5	Yes
85	M	2y	L leg	Pred, AZA, MMF	None	4	Yes
44	M	1y	L leg	Pred, MTX, adalimumab, MMF	Clindamycin, doxycycline	4	Yes
44	M	1y	L leg, L arm, R abdomen	Pred, MTX, CSA	Doxycycline, minocycline	25	No
83	F	5y	Bilateral ankles	Pred, MTX, CSA	None	1	No
56	F	1y	Bilateral legs	Pred, MTX	None	2	Yes
53	F	8 y	R leg	Pred, MTX	None	6	Yes
56	F	>5y	Bilateral legs	Dapsone, adalimumab, rifampin, etanercept	Clindamycin	2	No
54	F	3y	R leg, L groin and buttocks	Pred, MTX, adalimumab	Doxycycline	4	Yes

AZA=azathioprine, CSA=cyclosporine, F=female, GV=gentian violet, IVIG=intravenous immunoglobulin, L=left, M=male, mos =months, MMF=mycophenolate mofetil, MTX=methotrexate, Pip=piperacillin, Pred= prednisone, R=right, Tazo=tazobactam, TM-SMX=trimethoprim-sulfamethoxazole