Is there a difference between burn patients treated with topical mafenide acetate before and during COVID-19?

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Is there a difference between burn patients treated with topical mafenide acetate before and during COVID-19?

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Introduction and Objective

- Mafenide acetate is an antibiotic used to prevent and treat skin infections, specifically pseudomonas, for some patients with burns. Mafenide acetate does not prevent or treat fungal infections therefore antifungal medications are commonly added.
- Purpose: The Journal of burn care & research found in 2017 that 2.5% mafenide acetate is equally effective compared to 5% mafenide acetate.[1] Based on these findings, Lehigh Valley Health Network's (LVHN) Regional Burn Center transitioned from 5% to 2.5% mafenide acetate.
- Our first objective was to establish baseline data for patients treated with 2.5% mafenide acetate between the dates of August 2015 to April 2021.
- Our second objective was to identify if during the COVID-19 pandemic infection rates rose in the patient population treated with mafenide acetate, as personal protective equipment (PPE) was spared for COVID-19 patients.

Methods

Quality improvement project that includes a chart review of 317 patients from August 2015 to April 2021

COVID-19 chart review of 78 patients from March 16, 2020, to May 19, 2021

Resources consisted of the electronic medical record (EMR), RedCAP, Microsoft excel, pharmacy and infection control databases

Mafenide acetate data

Information gathered included how many doses of mafenide acetate were given, sites where mafenide acetate was placed and what infections the patient acquired

Descriptive statistics were used to collect demographic information such as gender, race, ethnicity, age, comorbidities, length of stay (LOS) and total burn surface area (TBSA)

Results

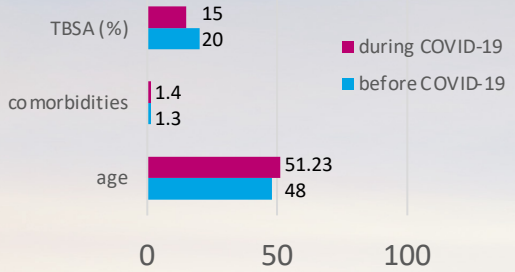

Figure 1. Comorbidities and age were higher during COVID-19-mafenide. TBSA was higher before COVID-19-mafenide.

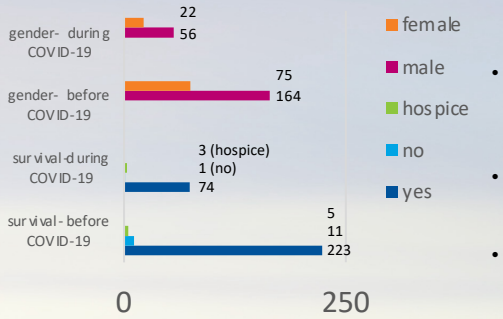

Figure 2. Males were the higher gender for both time frames. In total 12 deaths were calculated.

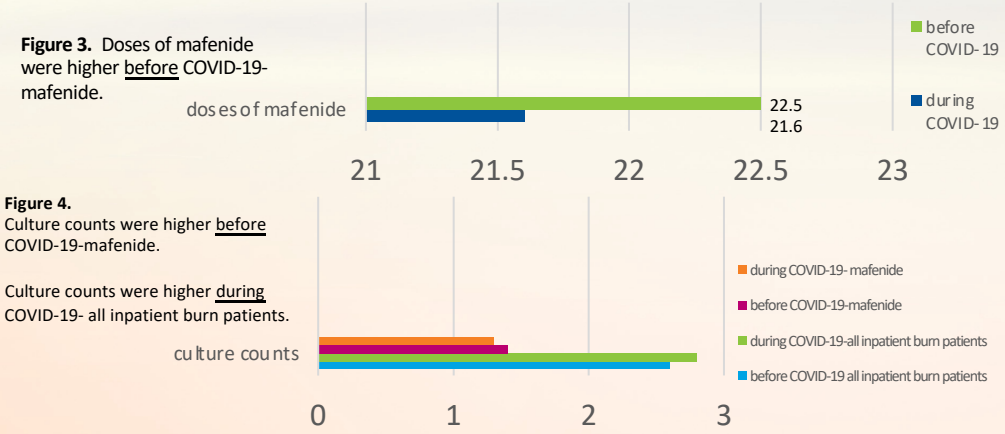

Figure 3. Doses of mafenide were higher before COVID-19-mafenide.

Figure 4.
Culture counts were higher before COVID-19-mafenide.

Culture counts were higher during COVID-19- all inpatient burn patients.

	Null Hypothesis	Test	Sig.[a,b]
1	The distribution of LOS in Days is the same across categories of InHospDuringPPE.	Independent-Samples Mann-Whitney U Test	.162
2	The distribution of tbsa is the same across categories of InHospDuringPPE.	Independent-Samples Mann-Whitney U Test	.218
3	The distribution of doses_of_mafenide is the same across categories of InHospDuringPPE.	Independent-Samples Mann-Whitney U Test	.945
4	The distribution of Culture_Counts is the same across categories of InHospDuringPPE.	Independent-Samples Mann-Whitney U Test	.319
5	The distribution of Comorbid_Counts is the same across categories of InHospDuringPPE.	Independent-Samples Mann-Whitney U Test	.186

Figure 5. There are no statistically significant differences in the following categories when comparing mafenide data.

Conclusions

- During the PPE sparing time frame, we found that older patients had a longer LOS. We suspect that the lack of availability in nursing homes during COVID-19 caused this.
- As for doses of mafenide administered, patients who had a longer LOS received more doses in both groups.
- Comorbidities did not significantly contribute to the LOS in either group.
- Patients who had a higher number of positive cultures had a longer LOS in both mafenide groups.
- Figure 4 shows that culture counts were higher before COVID-19- mafenide. We suspect this is because the average TBSA was higher for that time frame. The figure also shows that culture counts were higher during COVID-19-all inpatient burn patients. We suspect this is due to the lack of PPE during that time frame.
- Figure 5 shows that there was no statistically significant difference between positive culture counts before COVID-19-mafenide compared to during COVID-19-mafenide.

Discussion and future directions

If the exact date of change from 5% to 2.5% mafenide acetate becomes available, it would be beneficial to look further into infection rates for comparison.

Continuous observation of infection rates is recommended as this project provides a baseline for comparison.

Reference

1. Afshari, A., Nguyen, L., Kahn, S. A., & Summitt, B. (2017). 2.5% Mafenide Acetate: A Cost-Effective Alternative to the 5% Solution for Burn Wounds. *Journal of burn care & research official publication of the American Burn Association*, *38*(1), e42–e47. https://doi.org/10.1097/BCR.0000000000000425