

A Comparison of Pediatric Burn Injuries Based on Cultural Environment

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Study Purpose

The purpose of our study was to determine whether burn injuries to Amish children (under the age of 14 years) are associated with a greater severity when compared to non-Amish children.

Significance/Introduction

As a regional burn center it is important to examine demographics, incidence and causes especially noting patients or populations 'at-risk'. Identifying these groups and bringing awareness to the population at-risk can assist with a reduction in burn injuries. Most of the counties that fall within the Midwestern service region of our burn center are heavily populated with the Amish/Mennonite population.

- In further discussion Amish/Mennonite will be referred to as Amish

Background

- Ohio has one of the largest Amish populations in the United States
- Amish comprise 42% of the population in Holmes County
- Amish try to maintain cultural customs to preserve their identity minimizing assimilation into American culture and selectively using technology
- Cultural beliefs, lifestyle, and environmental situations predispose them, especially their children to inherent risks for burn injuries
- Contributing situations include:
 - Scalding water
 - Food preparation
 - Farming
 - Thermal injury from flames/flammable liquids
 - Non-electric heat sources

Methods

Retrospective chart review of all Inpatients seen in a Mid-western verified pediatric and adult burn center from 7/1/12 through 12/31/18

- Inclusion Criteria
 - Male/female patients, <14 years of age
 - Must have a diagnosis of an acute burn injury
- Exclusion Criteria
 - Non-accidental trauma diagnosis
 - Frostbite
- Comparison of categorical measures across the two groups used Pearson chi-square or Fisher Exact test, as applicable
- Comparison of continuous measures across two groups used Satterthwaite Adjusted t-test or Wilcoxon Rank Sum test, as appropriate
- Statistical tests were two-tailed

Results

A total of 273 patients fit the criteria:

- Amish: 16 (6%)
- Non-Amish: 257 (94%)
- Gender
 - Female: 108 (40%)
 - Male: 165 (60%)
- Age, mean
 - Amish: 4.8 years
 - Non-Amish: 4.0 years

Data Measurement Element	Amish	Non-Amish
Total Patients	16*	257
TBSA %, mean	30%*	5%
Injury Severity Score, mean	14*	3
Number of Complications, mean	3%*	<0.1%
Surgeries, mean	4*	<1
Patients on Ventilator	31%*	3%
Days on Ventilator, mean	7 days	<0.1 day
Length of Stay	36 days*	6 days
Discharge to Rehabilitation	37.5%*	0.8%

Table 1: Comparison of Data Elements – Amish vs Non-Amish

* Statistically significant values

Results (cont)

Scald and flame most prevalent in both populations:

Scald Burns, n=146

Overall: 54% most common injury

- Amish: 50%, n=8
- Non-Amish: 53.7%, n=138
- Children were younger, mean 2.5 years
- Mean TBSA 6.3%
- Skin grafting: 15.8% of the cases
- Complications: rare, 4.1% of the cases

Fire/Flame Burns, n=57

Overall: 20.9%, second most common

- Amish: 43.8%, n=7
- Non-Amish: 19.5%, n=50
- Children were older, mean 7.7 years
- Mean TBSA 14%
- Skin grafting: 47.4% of the cases
- Complications: found in 24.6% of the cases

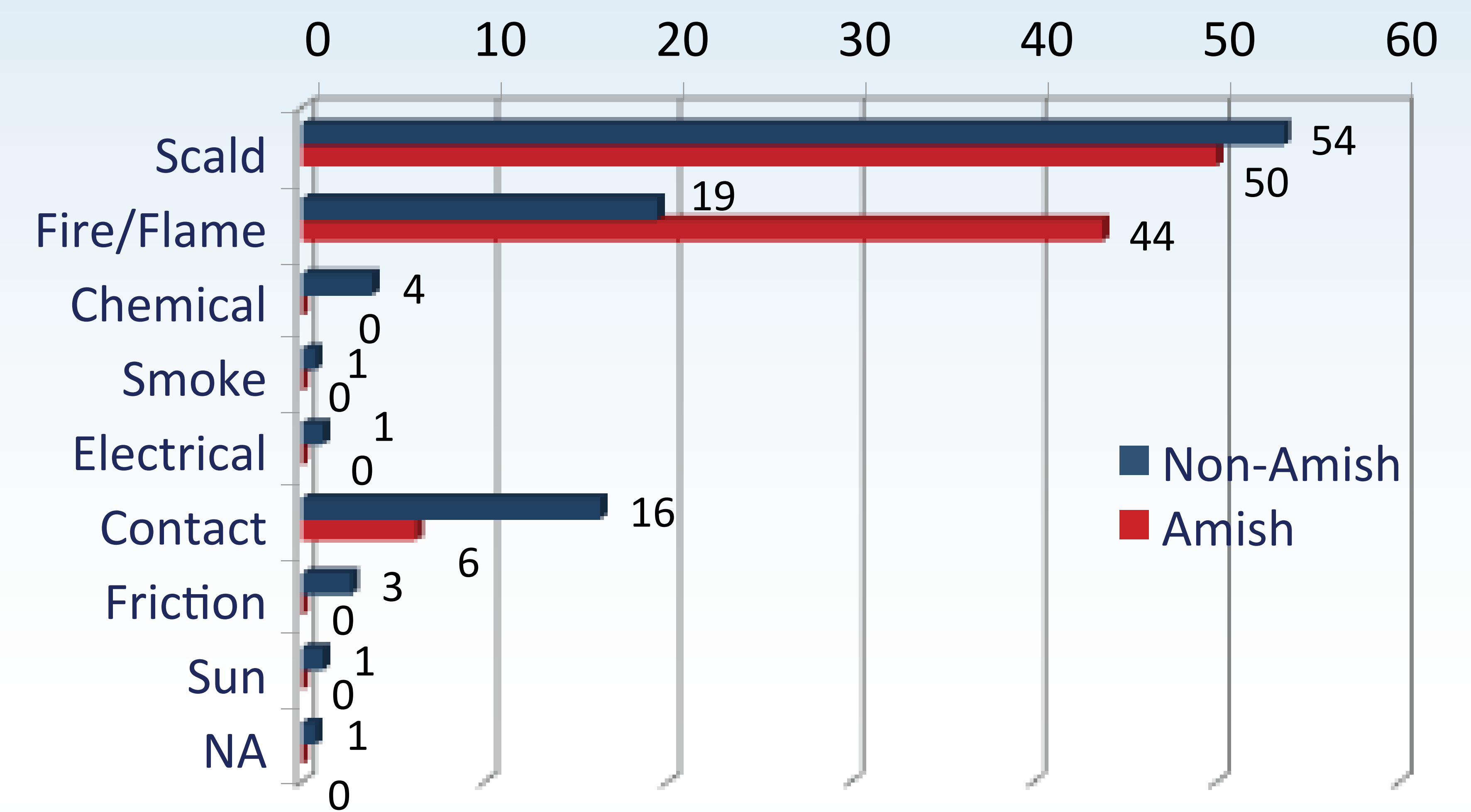


Figure 1: Burn Mechanism Comparison (in percentage)

Discussion

- Burn incidences are not fully represented in the Amish population
- In comparison our study found Amish and non-Amish children were similar in age, male gender and percent needing surgery
- Amish children had greater median injury severity score (ISS), median TBSA, median length of stay, and median number of surgeries
- Complications were more prevalent among Amish children
- When the injury was from fire/flame, the Amish had a greater need for rehabilitation

Limitations/Bias

- Missing data in the electronic health record
- Non-Amish children may be admitted for social concerns, which is uncommon in the Amish population
- Amish admission rate can be limited since Amish children with minor burn injuries are often treated at home instead of being treated in a hospital

Conclusions

- In this study Amish children had greater burn surface area, greater severity, longer LOS, more complications and surgical interventions that non-Amish children
- Culturally appropriate prevention efforts and education are needed to enhance existing care and prevention with the Amish population

References

Gannon M. (2019). Amish population booms in the US. LifeScience. Accessed 02/28/2019 at <https://www.livescience.com/21916-amish-population-booms-in-us.html>