

Comorbidities or Significant Medical History in Firefighters Increases Likelihood of Larger Burn Injuries

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The Burn Center
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Introduction

Despite advances in gear technology and training, firefighters are still admitted to burn centers every year for burns of various etiologies and severities. Elucidating the factors that contribute to firefighter injury may help decrease injuries and make admissions to burn units a thing of the past. The aim of this study was to determine if firefighters with significant past medical histories or comorbidities had a higher likelihood of obtaining larger burns on the fire-ground.

	OR	CI Low	CI High	P-value
Cohgb	12.2	3.6	42.0	<.0001
Comorbidity	2.0	1.0	3.9	.0471

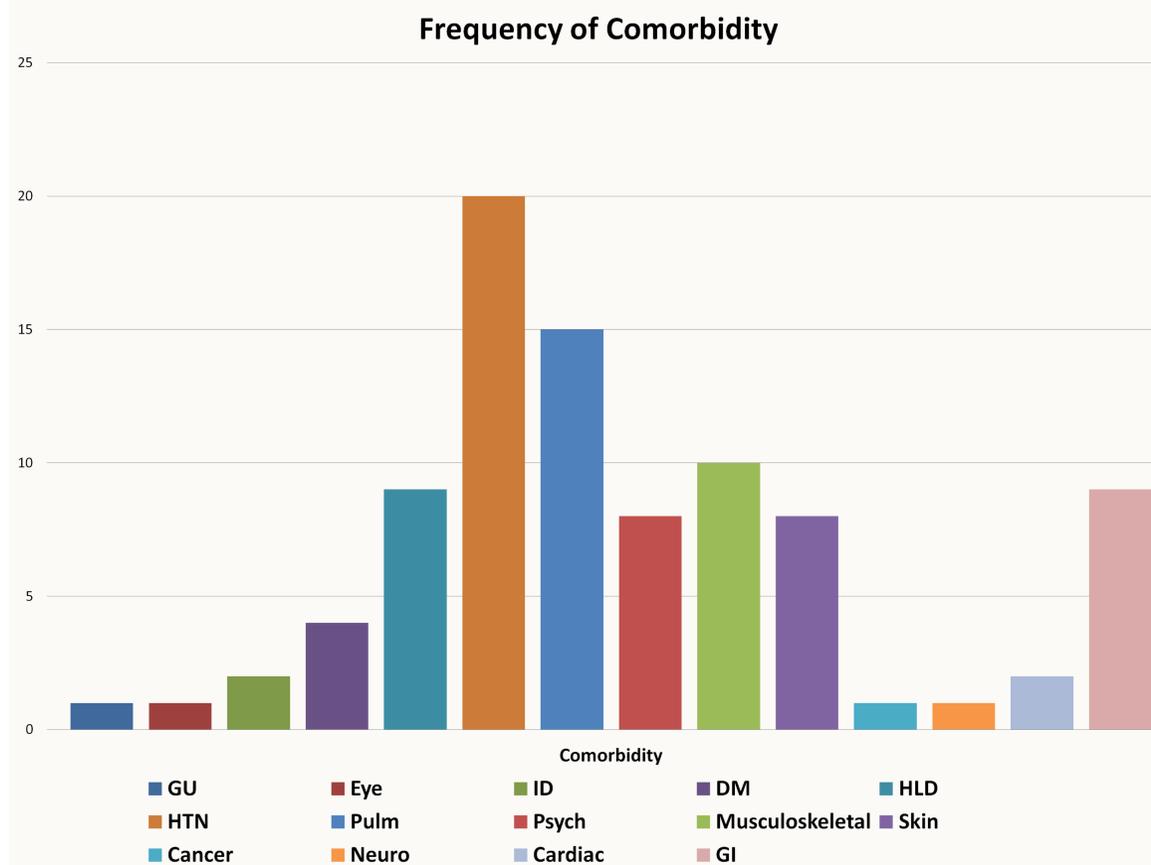


Figure 1: Frequency of comorbid conditions (GU=Genitourinary, HTN=Hypertension, Pulm=Pulmonary, Neuro=Neurological, ID=Infectious Disease, Psych=Psychiatric, DM=Diabetes, GI=Gastrointestinal, HLD=Hyperlipidemia)

Results

Of the records queried, 286 patients met criteria for analysis. The majority of patients were white males (73% and 95% respectively). The mean length of stay (LOS) was 1 day with a mean age of 31 years. The average %Total Body Surface Area burn (TBSA) was 3% (Table 1). All but one patient was discharged home without additional services needed. Almost all patient care was covered by workers compensation. The most prevalent etiologies of injury were fire/flame, unknown and contact with a hot object. There were no mortalities recorded. A LOS \geq 1 day was significantly associated with an elevated carboxyhemoglobin ($p < .0001$) and having a comorbid condition or significant past medical history ($p = .047$) (Table 2). Older firefighters had smaller burns than younger firefighters ($p = .00095$).

Twenty-five percent of patients had a comorbid condition or other significant past medical history on admission. Patients with a comorbidity were slightly older, had longer LOS and ICU LOS (Table 1). Those patients with a significant past medical history had 5.2% larger burns than those without ($p < .0001$).

Table 2: Odds of having a LOS >1 day when TBSA, sex, race and presence of inhalation injury are controlled

Methods

The records of a large urban burn center were queried for firefighters who had received a burn injury from 2000-2009. Inclusion criteria included patients who had an occupation of firefighter, self-identified as being Caucasian or Black, and received a burn injury $\geq .01\%$ requiring medical treatment at this institution.

Parameter	Min	Max	Mean	Median
Age of all patients	17	54	31.4	30
Age w/ comorbidity	17	54	33.6	33.5
Age w/o comorbidity	17	54	30.6	29
LOS of all patients	0	68	1.1	0
LOS w/ comorbidity	0	68	2.0	0
LOS w/o comorbidity	0	44	.85	0
TBSA of all patients	.1	57	3.1	1
TBSA w/ comorbidity	.1	57	6.7	1
TBSA w/o comorbidity	.05	42	1.9	1
ICU LOS of all patients	0	39	.3	0
ICU LOS w/ comorbidity	0	31	.4	0
ICU LOS w/o comorbidity	0	39	.3	0

Table 1: Demographic data for all 286 patients, as well as those with and without comorbidities

Conclusion

Identification of possible comorbidities and significant medical problems from the beginning of a firefighter's career can help physicians better diagnose and treat these patients for a longer career and hopefully one with fewer injuries. This study is a retrospective series and only limited information could be obtained about the situations in which injuries occurred. We were also unable to obtain information regarding level of training and if the patients were career or volunteers. This leaves room for future prospective studies to follow well firefighters to determine if medical management of comorbid conditions can change overall frequency or size of potentially career ending injuries.