



Influencing factors for use of the Lund and Browder Chart for TBSA estimation in Western Australia

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Introduction

Burn injury is an important cause of mortality and morbidity in children. When treating burn patients, it's crucial to calculate the burn surface area expressed as a percentage of total body surface area (TBSA)¹, as it determines the need of IV fluid resuscitation and specialist burn care¹. The Lund and Browder chart (LBC) is used to measure TBSA in paediatric burns and accounts for variations in bodily proportions and age². The aim of this study was to investigate the factors that influence LBC use for TBSA estimation in paediatric burn care in Western Australia.

Methodology

An audit was conducted for 412 patients admitted to the paediatric burn unit in Perth, Western Australia between July 2016 and September 2018 that met the BRANZ inclusion and exclusion criteria³. The variables collected were delay to admission, multiple body site burn injury, TBSA, referral source, day of week of admission, burn cause, surgery for wound closure, length of stay and demographic characteristics.

Analysis

Multivariate logistic regression with stepwise elimination, t-tests and chi² tests were used. (p<0.05).

Results

412 persons aged 0 to 15 years were admitted into the burn unit in Perth. Seven patients (1.7%) did not have their TBSA recorded, and thus LBC use was not applicable. Use of the LBC was recorded for 405 patients; of these, 144 patients (35.5%) had a LBC completed. Model 1 shows that LBC use was strongly influenced by the size of the burn (p=0.002) and delayed admission to the burn unit (p=0.007). Two or more separate body sites injured was not statistically significant (p=0.065), but showed evidence of a clinical effect (Table 1). This variable is removed in Model 2 and statistically significant odds ratios reported.

The odds ratio indicates that for every 1% increase in TBSA, it was 20% more likely that LBC was used to estimate TBSA. For every hour delay to admission it was 1% less likely LBC was used to estimate TBSA (Table 2). A chi² test demonstrated that the mean TBSA was significantly higher for patients who had a completed LBC (4.65%, t=-4.69 p=0.000), compared to the patients who did not (2.34%).

References

1. Duke JM et al. [Mortality after burn injury in children: a 33-year population-based study](#). Paediatrics. 2015;135(4):903-10.
2. Miminis D. A critical evaluation of the Lund and Browder chart. Wounds. 2007;3(3):58-68.
3. About us [Internet]. Burns Registry of Australia and New Zealand (BRANZ). 2019 [cited 1 March 2019]. Available from: <https://branz.org/about>

Table 1 Influencing factors for LBC use (model 1)

Diagram Use	Coefficient	SE	95% CI	p
Time to Admission (Hours)	0.99	0.002	-0.009, -0.013	0.007
Multiple Sites	1.60	0.253	-0.0028, 0.965	0.064
TBSA	1.16	0.487	0.053, 0.2244	0.002

Table 2 Odds ratios for significant factors that influenced LBC use (model 2)

Diagram Use	Odds Ratio	SE	95% CI	p
Time to Admission (Hours)	0.99	0.018	-0.009, -0.018	0.003
TBSA	1.20	0.471	0.091, 0.275	0.000

Conclusion

LBC was used to calculate TBSA in approximately one-third of the paediatric patients. The charts were significantly more likely to be used to assess TBSA for those with bigger burns, and significantly less likely to be used to assess TBSA if there were delays to admission. The presence of multiple burn sites on the body was also an important clinical factor that influenced LBC use.

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