Fitting the pieces together B U R N S

Balance and Strength of Children and Adolescents following Lower Limb Burns: A Cross-sectional Study

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AIMS

- To investigate lower limb strength and balance of children and adolescents 3 to 6 months post lower limb burn injury compared to unaffected peers[1,2]
- To determine whether burn location alter performance

METHODS

- Participant characteristics and burn location were recorded.
- All participants received standard care.

Outcome Measures:

- Lower limb strength: 30 second sit-to-stand (STS) test
- Dynamic balance: The Bruininks-Oserestry Test of Motor Proficiency – 2nd edition (BOT-2) balance subsection and the star excursion balance test (SEBT) (posteromedial direction only).

- Unpaired t-tests were used to compare all children with burns to normative data, and to compare children with different burn locations.

REFERENCES

1. McKay MJ, Baldwin JN, Ferreira P, Simic M, Vanicek N, Burns J, Baldwin J, McKay M, Nightingale E, Pourkazemi F. Reference values for developing responsive functional outcome measures across the lifespan. *Neurology.* 2017;88(16):1512-1519.
2. Bruininks RH, Bruininks BD. *Bruininks-Oseretsky test of motor proficiency.* AGS Publishing; 2005.

RESULTS

Participants:
25 participants aged between 5 and 16 years (mean: 10.22 years, SD: 3.14) completed all the assessment components at a mean 125.6 days post lower limb burn injury. Total body surface area of burns ranged from 0.7% to 30% (mean: 6%). 9 participants had bilateral involvement and 10 had burns crossing lower limb joint surfaces. All participants showed no restriction in passive range of motion across all joints (hip, knee and ankle) irrespective of burn location.

Lower Limb Strength
Lower limb strength is significantly reduced in children 3- 6 months post lower limb burn injury. Burn location did not significantly alter performance (figure 1).

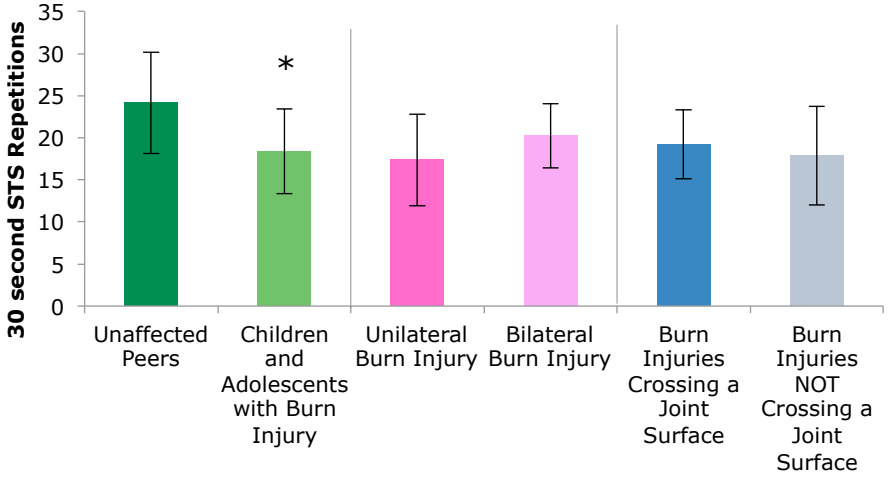

*Figure 1: 30 Second STS repetition between children and adolescents with burn injuries vs healthy unaffected peers and different burn locations *Indicates statistically significant at $p < 0.05$*

Lower Limb Balance
22 out of 25 participants scored average or above average on the BOT-2 balance subsection (figure 2).

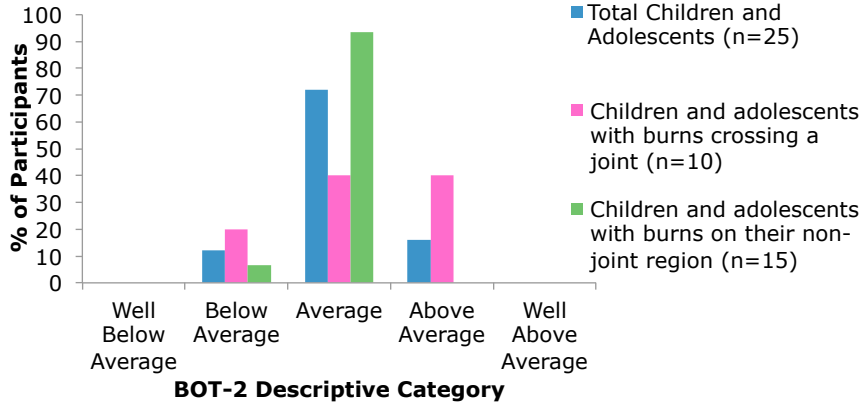

Figure 2: Distribution of The BOT-2 balance subsection scores based on normative data

BOT-2: Unaffected peers vs children with lower limb burns: $X^2 = 5.57$, $P = 0.06$, Joint vs non-joint: $X^2 = 1.43$, $P = 0.84$

SEBT: No significant difference between children and adolescents with lower limb burn injuries compared to unaffected peers (mean difference 3.82% leg length, 95%CI -10.31 to 17.94).

CONCLUSION

- Lower limb strength, but not balance, is reduced in children 3- 6 months post lower limb burn injury.
- Physiotherapists should consider focusing treatment on reconditioning to address reduced lower limb strength.

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