The efficacy and safety of adrenergic blockade post burn injury: A systematic review and metaanalysis

Orlando Flores PT¹, Kellie Stockton PhD², Jason A. Roberts PhD³, Michael J. Muller FRACS MMedSC⁴, Jennifer D. Paratz FACP PhD⁵

 Burns, Trauma and Critical Care Research Centre, The University of Queensland. Level 7, Block 6 Building. Royal Brisbane and Women's Hospital, Herston 4029 QLD. Brisbane, Australia. Email: orlando.flores.g@uqconnect.edu.au
Centre for Children's Burns and Trauma Research. Queensland Children's Medical Research Institute. Level 7 D, Lady Cilento's Children Hospital, South Brisbane 4101 QLD. Brisbane, Australia. Email: k.stockton@uq.edu.au
Burns, Trauma and Critical Care Research Centre, The University of Queensland and Royal Brisbane and Women's Hospital, Herston 4029 QLD. Brisbane, Australia. Email: j.roberts2@uq.edu.au
Burns, Trauma and Critical Care Research Centre, The University of Queensland and Royal Brisbane and Women's Hospital,

Herston 4029 QLD. Brisbane, Australia. Email: Michael. Muller@health.gld.gov.au

Introduction: The hypermetabolic state after severe burns is a major problem that lead to pathophysiological changes and multiple sequelae. Adrenergic blockade has been used to reverse these changes and improve outcomes, but the efficacy and safety of its use have not been well established. The aim of this systematic review is to investigate the efficacy and safety of use of adrenergic blockade post burn injury.

Methods: A systematic review of articles published was performed using six databases. Search terms included "burns", "burn", "burned", "burn injury" or "thermal injury" for population and "Beta-blockers", "Adrenergic beta-antagonists" or "propranolol" for intervention. Search process included each database from inception to December 2014 and was restricted by language and study design. After an independent screening and full text review, ten articles were selected and an appraisal of risk of bias was performed.

Results: Pooled analyses were performed to calculate effect sizes and 95% confidence intervals. There was a positive effect favouring propranolol use that significantly decreased resting energy expenditure (g=-0.55; 95%CI -0.8,-0.3; p<0.001) and trunk fat (g=-0.3; 95%CI -0.4,-0.1; p<0.001); and improved muscle protein net balance (g=3.9; 95%CI 3.0,4.8; p<0.001), peripheral lean mass (g=0.45; 95%CI 0.3,0.6; p<0.001) and insulin resistance (g=-1.35; 95%CI -2.0,-0.6; p<0.001). Mortality (RR=0.81, 95%CI=0.48-1.3, p=0.434) and incidence of sepsis (RR=0.80, 95%CI 0.48-1.3, p=0.404) were not significantly different between treated patients and controls.

Conclusions: Evidence suggests beneficial effects of propranolol post burn injury and its use appears safe. However, further trials on adult populations with a broader range of outcome measures are warranted.

Key Words

Burns, adrenergic blockade, beta blockade, propranolol, hypermetabolism

⁵ Burns, Trauma and Critical Care Research Centre, The University of Queensland, Rehabilitation Sciences Griffith University and Royal Brisbane and Women's Hospital, Herston 4029 QLD. Brisbane, Australia. Email: j.paratz@uq.edu.au

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