



Use of a supine cycle ergometer in a 75% TBSA burn: A case study

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Background

Major burns are complex and often necessitate long admissions to ICU. They are often associated with periods of mechanical ventilation, sedation and prolonged periods of limited mobility or bed rest. This can result in rapid loss in strength, range of movement (ROM) and exercise tolerance.

Case study

A 69 year old male sustained a 75% TBSA burn (>60% full thickness) with an associated lower airway injury. The burn injury resulted in a R) above elbow amputation and amputation of all digits on his L) hand. A tracheostomy was required on day 22 of admission. Decannulation occurred on Day 98 and he was transferred from ICU to the Burns Unit on day 104 of admission. Due to mechanical ventilation and sedation, medical instability, awaiting dermal substitute integration and serial split skin grafting long periods of bed rest and reduced mobility were required. Leg weakness and joint stiffness therefore resulted and it was decided to use a recently purchased MOTomed® (letto2) supine cycle ergometer to aid in leg strengthening and ROM.

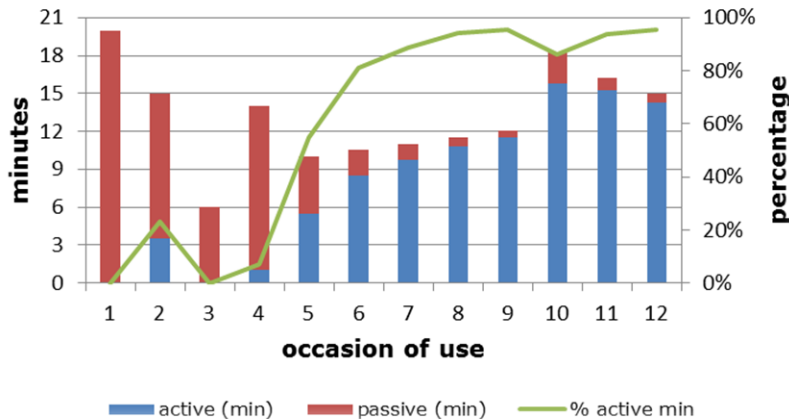
Use of a supine cycle ergometer

Clearance for use of the supine cycle ergometer occurred on day 100 of admission. It was used a total of 14 times over a 40 day period. The cycle ergometer was used in combination with other forms of physiotherapy treatment which included active and passive range of movement, general progression of sitting balance and mobility and use of a tilt table. The cycle ergometer automatically responds to patient effort allowing active cycling or providing passive assistance. Resistance and speed were also adjustable.

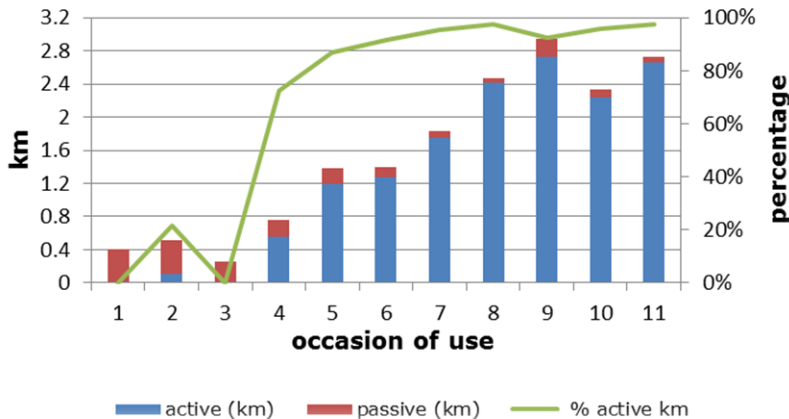
Results

The cycle ergometer was used on 14 occasions with data captured on time spent cycling (n=12) and distance cycled (n=11) (see adjacent graphs). Time spent cycling during each

Time spent actively or passively cycling



Distance actively or passively cycled



session ranged from 6-20 minutes. Distance cycled each session ranged from 0.25km – 2.75 km. Distance cycled increased significantly over the period of use. The percentage of active cycling (time spent and distance) also improved significantly over the period of use. From occasion of use 7 (time spent) and 6 (distance) active cycling was greater than 85% of total minutes and kilometres respectively.

Conclusion

The use of a supine cycle ergometer was a useful addition to available treatment options for physiotherapy. It was able to be used effectively in the acute phase of the patient’s admission and use began while the patient was still in ICU. It aided in hip and knee joint range of movement and lower limb strengthening, especially during the phase when the patient’s strength was not sufficient enough to stand and their sitting tolerance was limited. Subsequent to this first case the supine cycle ergometer has been used successfully with other burn patients in our care.

References

Hendon, D. (3rd ed) 2007, Total Burn Care, Saunders, Philadelphia.