The use of the bed bike for patients bedbound on mechanical circulatory support: a case study

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Patients at the heart of progress

Introduction

- Within the last 12 months the GJNH has had six patients who have been on Intra-Aortic Balloon Pump (IABP) as a bridge to heart transplantation.
- Due to the insertion of the IABP into the femoral artery, this prevents patients from getting out of bed and this often leads to reduced global strength especially in the lower limb[1].
- The longer patients are on bed rest on IABP, the more at risk they are for heart transplantation and other advanced therapies.
- Prior to this project the standard Physiotherapy practice was to teach patients active bed exercises to carry out four times a day, which could be progressed by adding ankle weights or theraband resistance. This is standard practice across heart failure centres using femoral IABP's.

Aim

- To introduce the use of a bed bike for patients on IABP in addition to standard Physiotherapy practice.
- Improve or maintain patients strength throughout the period they are on the IABP.
- Increase the length of time patients can be physically strong enough to be accepted for heart transplant or advanced therapies.

Methods

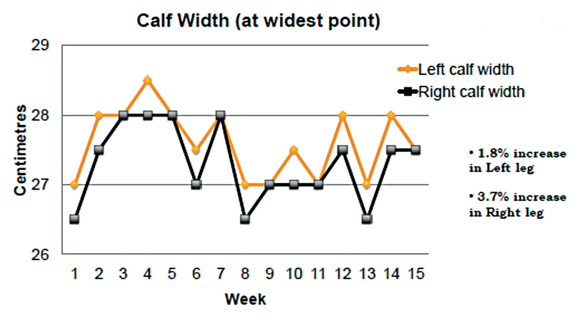
Baseline measurements were taken prior to commencement of the bed bike when the patient had been doing active exercises in bed only. Measurements were taken weekly and on both legs to compare.

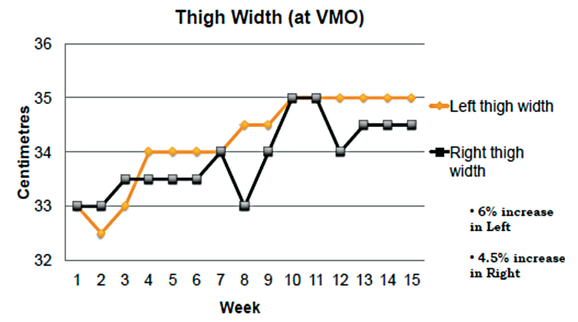
Outcome measures were:

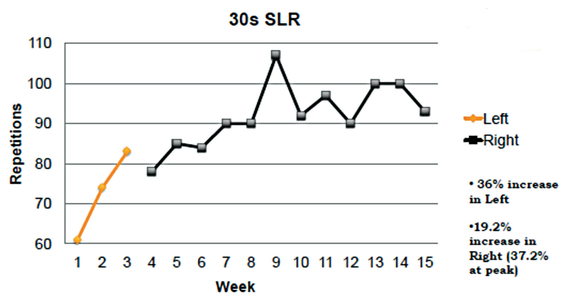
- Calf width
- Thigh width
- Grip strength (using dynamometer)
- Leg strength measurements (IRQ/ SLR)
- Quality of life questionnaire (modified EQ-5D)

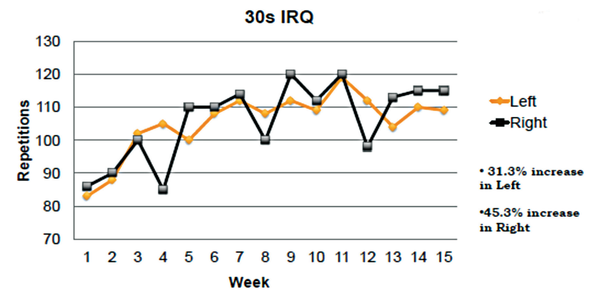
The patient continued with active exercises with the addition of single leg strengthening on a bed bike under supervision. The time and level of resistance of the use of the bed bike was increased as the patients exercise tolerance improved.

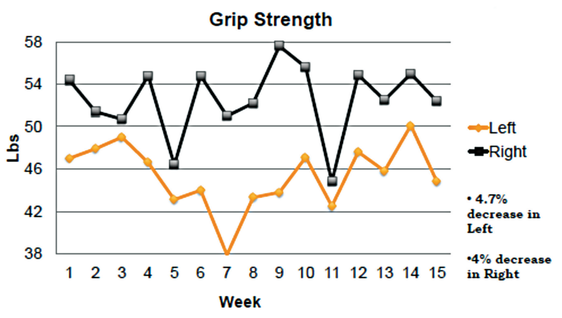
Results

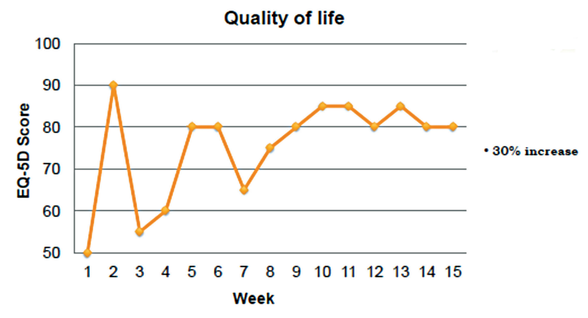












Conclusion

- In addition to standard physiotherapy practice, the bed bike is safe and effective in the maintenance, and potential increase in muscle strength with patients who are bed bound on mechanical circulatory support.
- Not only is it shown to be beneficial in the leg not connected to the IABP but also the stabilisation effect of the IABP leg whilst using the bed bike.
- An increase in physiotherapy intervention has not only improved physical outcomes but also psychological health with social interactions and goal setting with the bed bike.
- As a result of this case study, the GJNH now use a combination of strengthening exercises (standard practice) plus bed bike for all patients on a IABP as a bridge to heart transplantation.

References

1. Parry SM, Puthucheary ZA (2015) The impact of extended bed rest on the musculoskeletal system in the critical care environment. Extreme Physiol Med 4:16

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