“Rehab on the edge”: The haemodynamic response to initial mobilisation in critically ill adults with COVID-19. A service evaluation.

Jennifer Balls[1,2] and Katie Dowling[1],Steve Glynn[1], Claire Purkiss[1]
[1]Royal Brompton Hospital, London, [2]Imperial College, London

Background

SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) has been responsible for one of the largest global viral outbreaks in recent years (1). Admissions to ICU have increased. A common consequence of prolonged ICU admission is ICU-acquired weakness (ICUAW) (2).

Rehabilitation in ICU is well established to be beneficial in combating ICUAW and should be started as early as clinically possible (3). **This service evaluation aimed to explore the haemodynamic effects of the first active rehabilitation session on ICU in this complex patient population.**

Aims and Objectives

1. To evaluate the haemodynamic response to the first “out of bed” rehabilitation session in adults with COVID-19 at a specialist intensive care unit (ICU).
2. To analyse routinely collected data to establish if there were statistically significant changes in variables that would indicate haemodynamic instability.

Method

Study design: Prospective, observational service evaluation undertaken at the Royal Brompton Hospital Adult Intensive care Unit, April 2020 to June 2020.

Data collection: Routinely collected cardiovascular and respiratory data were measured for fifteen minutes before, during and for 30 minutes after the initial rehabilitation session: Heart rate (HR), Systolic blood pressure (SBP), Diastolic blood pressure (DBP), Mean arterial pressure (MAP), Peripheral oxygen saturation (SpO_2)

Statistical analysis: Median data were analysed via non-parametric ANOVA. Statistical significance set at p=0.05 level. Clinically significant changes (%) were pre-determined using published literature.

Clinical significance and adverse events were defined as

- A fall to the knees
- Tube removal
- Systolic blood pressure > 200mmHg or < 90mmHg
- Oxygen desaturation <80%
- Extubation (4)

Patient Demographics

N=23	17 male	Median age 45 (IRQ 26,40)	MV N=20 +ECMO=4	SV N=3

Rehab session

Median length of MV prior to first rehab session	34 days (IRQ 26.40)
Sit on edge of bed	N=23 (100%)
Median session length	11 minutes (IRQ 8,14)

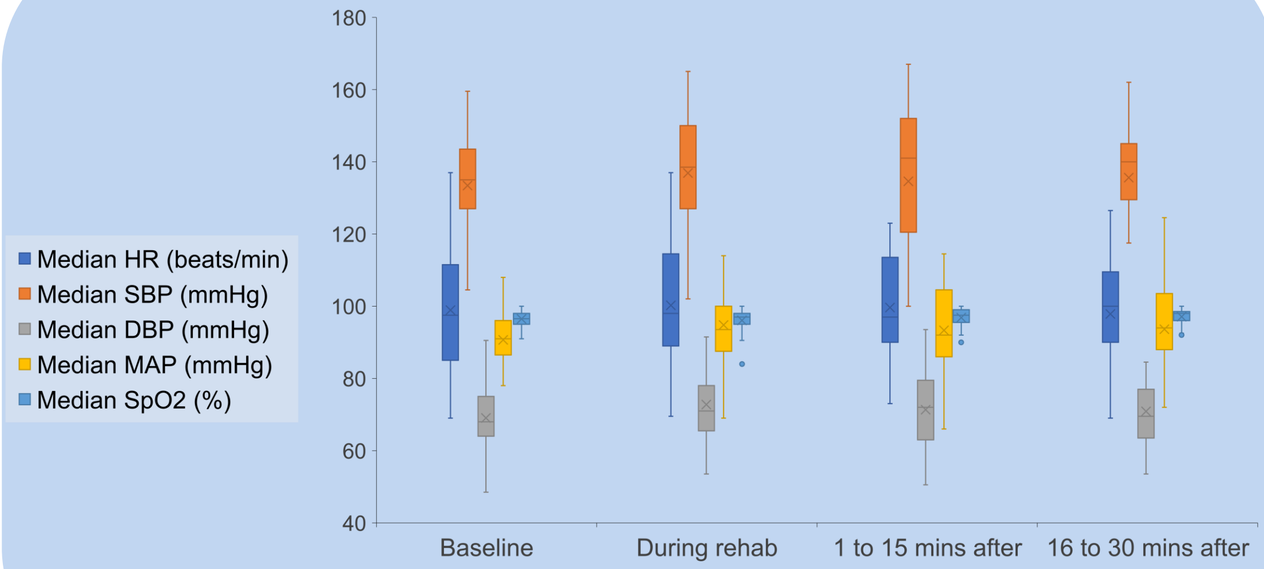


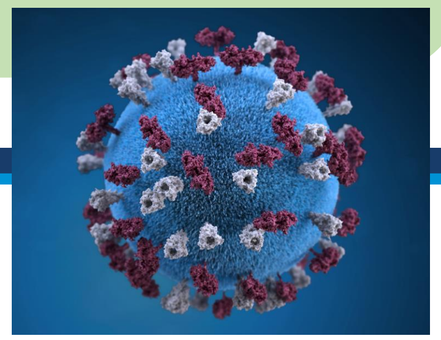
Figure 1: Group median data by study period for each variable

Group analysis did not identify any statistically significant changes in HR (p=0.975), SBP (p=0.907), DBP (p=0.783), MAP (p=0.625) or SpO_2 (p=0.666) across the four study periods. There were no clinically significant changes across the variables (range -0.5% reduction to 5.9% increase).

Conclusions

✗ Small sample size, non-generalisable results
✓ No serious adverse events
✓ A thorough multi-disciplinary assessment of the patient prior to starting rehabilitation is essential to ensure patient safety.

This service evaluation suggests that initial active rehabilitation in a group of critically ill adults with COVID-19 at a specialist centre can be performed safely without detrimental cardiovascular changes.



References:
1. Kumar, M. and Al Khodor, S. (2020). ‘Pathophysiology and treatments strategies for COVID-19’, Journal of Translational Medicine. 18 (353)
2. Taylor, C. (2018) ‘Intensive care unit acquired weakness’, Anaesthesia & Intensive Care Medicine, 19(3), pp 79-82.
3. National Institute for Clinical Excellence (2009) NICE CG83:2013 Rehabilitation after critical illness in adults. London: National Institute for Clinical excellence.
4. Bailey P, Thomsen GE, Spuhler VJ, et al. Early activity is feasible and safe in respiratory failure patients. Crit Care Med 2007; **35:** 139–45.