

Intraoperative Octreotide Infusion During Liver Transplantation is Associated With Reduced Postoperative Ventilatory and Cardiovascular Support Requirements: A Single Centre Retrospective Cohort Study

Alexander Leigh,¹ Jeremy Fabes¹, Timothy Snow¹, James Gladwin¹, Alexander Bell¹, Michael Spiro¹

¹ Royal Free Perioperative Research Group, Royal Free Hospital, London, UK.

Email: alexander.leigh@nhs.net

INTRODUCTION

Liver transplantation is associated with significant morbidity including hypotension, acute kidney injury, major haemorrhage, acid base disturbances and resource intensive organ support on the critical care unit

The duration of mechanical ventilation in the postoperative period is associated with poorer post-transplant outcomes¹

Octreotide, a somatostatin analogue, corrects splanchnic blood flow, reduces portal hypertension², improves renal perfusion³ and may reduce bleeding during liver transplantation.

Some centres, including our own, administer intraoperative octreotide infusion during liver transplant surgery.

We hypothesised that intraoperative octreotide infusion would reduce postoperative organ support requirements, shorten ICU length of stay and reduce intraoperative transfusion requirement.

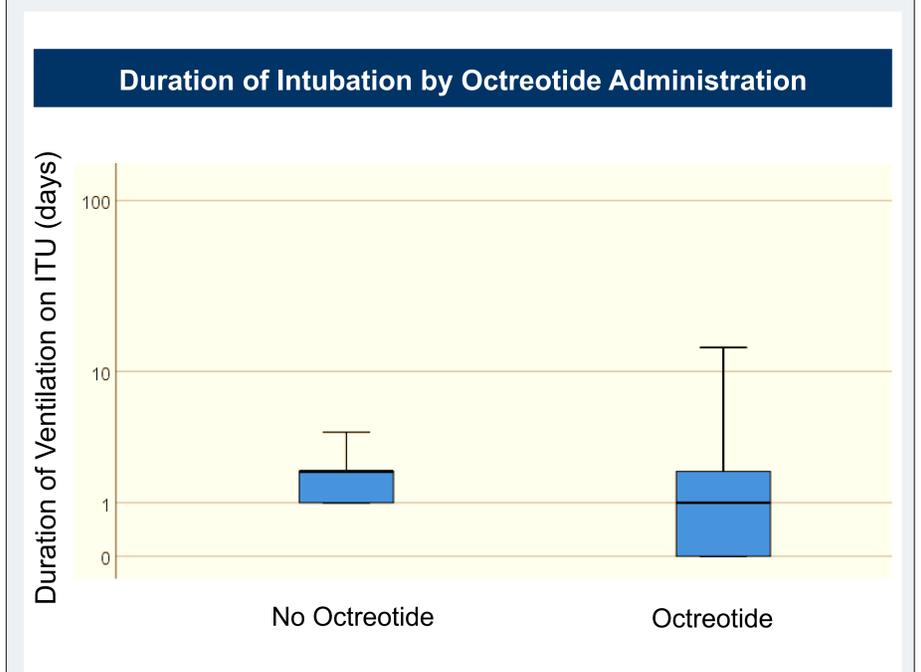
METHODS

- A single centre retrospective cohort study
- Inclusion criteria: all liver transplants performed at the Royal Free Hospital between December 2015 – January 2019
- Exclusion criteria: redo & super-urgent transplants
- Data were obtained from the institution’s electronic liver transplantation research database, critical care database and clinical notes.
- A total of 304 patients were identified. 24 were excluded for missing data. 280 patients were included in the analysis.
- Binary logistic regression of potential risk factors for prolonged intubation on ITU was performed using backward elimination.
- The following variables independently associated with prolonged intubation were included in the final model: age, duration of CVS support, requirement for renal replacement therapy, intraoperative octreotide administration
- Outcome comparisons between the octreotide and no octreotide groups were performed using Mann Whitney U test

RESULTS

- Intraoperative octreotide administration is associated with
 - Reduction in the duration of postoperative mechanical ventilation
 - Reduction in the duration of postoperative cardiovascular support
- There was no association between octreotide administration and ICU length of stay or intraoperative transfusion requirement

	Octreotide				Significance
	No		Yes		
	Mean/ Median	SD/QR	Mean/ Median	SD/QR	
Intraoperative PRBC transfused	4.8	8.4	3.9	5.8	0.598
Duration of Intubation	2.0	[1-2]	1.0	[0-2]	0.001
Duration of CVS support	0	[0-2]	0	[0-1]	< 0.001
ICU LoS	3	[2-6]	4	[2-8]	0.111



DISCUSSION

- This study demonstrates a reduced time to extubation after intraoperative octreotide administration. We offer two possible mechanisms to explain this finding based on octreotide-mediated redistribution of circulating volume away from the portal circulation.
- 1 – centralisation of blood volume resulting in improved systemic perfusion during the perioperative period; this study provides some evidence for this phenomenon, namely the reduced requirement for postoperative cardiovascular support.
- 2 - improved renal perfusion may reduce the likelihood of postoperative renal dysfunction and acid base disturbance.
- Decisions to extubate patients in ICU are based on biochemical and clinical parameters. Reduced cardiovascular support requirements and better acid-base homeostasis may influence clinicians decision to extubate.
- Octreotide-mediated reduction in portal blood flow or pressures to reduce bleeding to the point of any alteration in intraoperative transfusion requirements was not observed in this study, although blood loss was generally poorly recorded.
- Although the demonstrated reduced time to extubation and reduced duration of cardiovascular support are desirable clinical outcomes, there was no difference in the length of stay on ITU between the two groups.
- Future research in this area should explore the effects of octreotide on renal perfusion, in particular on the relationship between intraoperative octreotide administration and the risk of acute kidney injury postoperatively.

CONCLUSION

Intraoperative octreotide infusion shortens the duration of cardiovascular support and reduces the time to extubation in the intensive care unit following liver transplantation, but has no effect on ITU length of stay or perioperative transfusion requirements. Future research should focus on the effects of octreotide on acute kidney injury.

1. Yuan et al. Prognostic impact of mechanical ventilation after liver transplantation: a national database study. Am J Surg, 2014;208(4): 582-590
2. Zironi et al. Short- and long-term hemodynamic response to octreotide in portal hypertensive patients: a double-blind, controlled study. Liver 1996, 16: 225-234
3. Pomier-Layrargues et al. Octreotide in hepatorenal syndrome: a randomized, double-blind, placebo-controlled, crossover study. Hepatology 2003;38:238-243