IMPLEMENTATION OF ENHANCED RECOVERY AFTER SURGERY (ERAS) PROGRAMME FOR ELECTIVE COLORECTAL SURGERY: A SINGLE INSTITUTION'S EXPERIENCE.

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Introduction

The Enhanced Recovery After Surgery (ERAS) Society was founded with the mission to develop peri-operative care and to improve recovery through research, education, audit and implementation of evidence-based practice. The ERAS Programme is a multi-disciplinary approach to peri-operative management of patients undergoing major surgery. When compared to traditional standard care, patients under the ERAS Programme have significantly lower post-operative complications and hospital stay.

Tan Tock Seng Hospital (TTSH) has been a member of the ERAS Society since March 2016, one of the first 2 centres in Asia to fully implement the ERAS Programme.

In this study, we examine the early impact of ERAS guideline implementation in our institution on patient outcome after elective major colorectal surgery.

Team Members

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Evidence for a Problem Worth Solving

180 consecutive patients who underwent elective colorectal surgery under the ERAS Programme from March to December 2016 were analyzed from a prospectively-maintained database. They were compared with retrospective data of 335 elective colorectal surgery patients from January 2015 – May 2016.

The primary outcome measure was post-operative length of hospital stay. Secondary outcome measures included post-operative complications and readmission rates. Statistical analysis was performed using GraphPad Prism. P-values of <0.05 were considered statistically significant.

Key Elements of TTSH ERAS Programme

Pre-operative
- Pre-admission ERAS counselling
- Selective bowel preparation
- Carbohydrate loading with avoidance of prolonged fasting before surgery
- Immuno-nutritive supplements before surgery
- Avoidance of long-acting pre-anaesthetic sedation

Intra-operative
- Thoracic epidural anaesthesia for open surgery
- Avoidance of hypothermia
- Restrictive fluid regimen
- No routine use of drains

Post-operative
- Early removal of urinary catheters
- No routine use of nasogastric tubes
- Early initiation of enteral feeding
- Early mobilization of patient
- Audit of compliance and outcomes

References

1. Gustafsson UO, Scott MJ, Schwenk W et al. Guidelines for perioperative care in elective colonic surgery: Enhanced Recovery After Surgery (ERAS) Society recommendations. World J Surg 2013; 37: 259–84.
2. Muller S, Zalunardo MP, Hubner M et al. A fast-track program reduces complications and length of hospital stay after open colonic surgery. Gastroenterol 2009 Mar;136(3):842-7.

Workflow for Patients under TTSH ERAS Programme

Listing for Surgery
- Identification for ERAS Programme
- Nutritional and ambulatory screening
- Selective prescription of bowel preparation
- Prescription of immuno-nutrition and carbohydrate loading

Prior to Surgery
- Pre-operative ERAS nurse consult
- Selective physiotherapy and chest physiotherapy for at-risk patients
- Selective dietician review for at-risk patients

Day of Surgery
- Selective use of thoracic epidural anaesthesia for open surgery
- Preferential use of regional anaesthetic adjuncts such as Transversus Abdominis Plane (TAP) blocks and slow-release local anaesthetic delivering systems
- Preferential use of minimally invasive techniques
- Use of patient warming devices and warmed intravenous fluids to avoid hypothermia
- Restrictive fluid regimen to avoid fluid and sodium overload

After Surgery
- Initiation of enteral caloric intake on Post-Operative Day (POD) 0
- Progression of enteral nutrition with daily caloric goals
- POD 0 and subsequent progression of mobilization
- Novel use of pedometers and tracking charts to monitor patient progress
- Early removal of urinary catheters

After Discharge
- Audit of compliance and outcome measures

Results

Patient Demographics

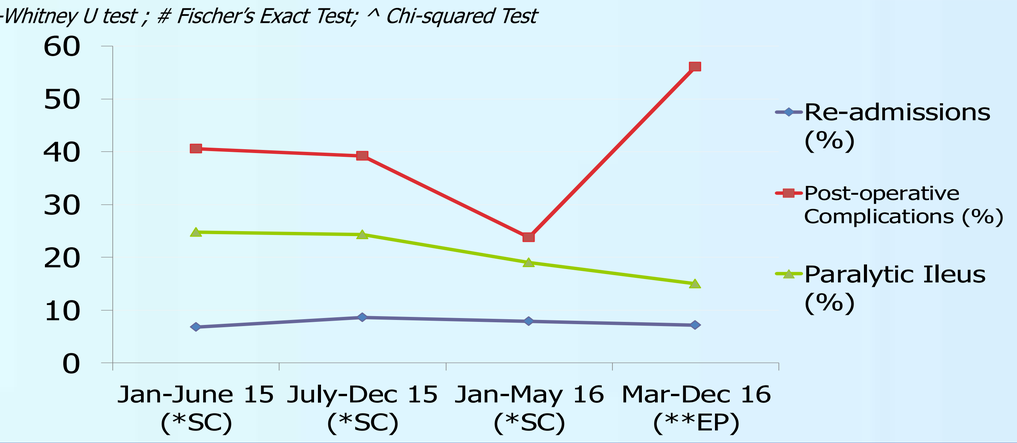
	Standard Care (n=335)		ERAS Programme (n=180)		p-value
Median age in years (range)	68 (19 – 97)		69 (28-95)		0.0673*
Gender	Male	206	Male	114	0.874#
	Female	129	Female	66	
ASA grade	I	7	I	6	0.471^
	II	203	II	101	
	III	125	III	73	
Type of Surgery	Colectomy	118	Colectomy	44	0.147^
	Anterior Resection	190	Anterior Resection	128	
	Abdomino-Perineal Resection	15	Abdomino-Perineal Resection	4	
	Proctocolectomy	2	Proctocolectomy	1	
	Reversal of Hartmann's	10	Reversal of Hartmann's	3	

ASA: American Society of Anesthesiologists
** Mann-Whitney U test; # Fischer's Exact Test; ^ Chi-squared Test*

Outcome measures between Standard Care and ERAS Programme

	Standard Care (n=335)		ERAS Programme (n=180)		p-value
Median post-operative length of stay in days (range)	7 (3-41)		6 (3-70)		**<u>0.025</u>***
Re-admissions (%)	26 (7.8)		13 (7.2)		0.228^
Post-operative Complications (%)	None	211 (63.0)	None	108 (60.0)	0.204^
	Clavien-Dindo Grade I-II	103 (30.7)	Clavien-Dindo Grade I-II	55 (30.6)	
	Clavien-Dindo Grade III-V	21 (6.3)	Clavien-Dindo Grade III-V	17 (9.4)	
Paralytic Ileus (%)	79 (23.6)		27 (15)		**<u>0.033</u>#**

** Mann-Whitney U test ; # Fischer's Exact Test; ^ Chi-squared Test*



Conclusion

Implementation of ERAS Programme in TTSH is associated with significantly shorter duration of post-operative hospital stay and lower rates of paralytic ileus post-surgery. There is also no significant difference in total post-operative complications and hospital re-admissions post-surgery. The difficulties in implementing the full ERAS programme and achieving a high level of compliance were multifactorial. Despite these challenges, the adoption of ERAS protocol can result in improved patient outcomes and should be considered as standard of care in this group of patients.