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Pre and Post-Implementation Results of Enhanced Recovery After Surgery (ERAS) For Liver Surgery in an Asian Tertiary Institution

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Background and Goal of Study: ERAS was conceptualized in mid-90s for colorectal patients and has since been replicated in other surgical specialties. ERAS allows faster recovery, reduction of complication rates and hospital length of stay, without an increase in readmission rate¹. Liver resection poses unique challenges such as pre-existing liver disease or malignancy, postop coagulopathy, fluid management, biliary leak and postop organ failure². Our study aims to demonstrate results of ERAS in liver surgery at our institution, Singapore General Hospital, which is the largest tertiary hospital in Singapore.

Materials and Methods: Consent was obtained from Singhealth Centralised Institutional Review Board. We used surgical outcome data for open and laparoscopic liver surgeries. The outcome data from January - September 2017 was used as the baseline for pre-ERAS implementation and data from October 2017 - July 2019 was used for comparison post-implementation. ERAS programme was a multidisciplinary effort implemented from October 2017, which included preoperative education, intraoperative protocols for anaesthesia, postoperative care and post-discharge followup (figure 1).

Results and Discussion: Pre-implementation of ERAS, there was significant variation in median length of stay (LOS) (3 – 18 days) among individual surgeons as compared to the hospital median for both laparoscopic and open surgeries (figure 2). Following ERAS implementation, there was decreased median LOS from 6 to 3 days and decreased inter-surgeon variation in LOS (figure 3). The mean Post Operative Morbidity Survey (POMS) score at postoperative days (POD) 3, 5 and 7 was decreased for ERAS vs non-ERAS patients.

Conclusion: The ERAS programme reduced both the median and variation of LOS, as well as the POMS score at POD 3, 5 and 7 days. A standardized protocol with good compliance by surgeons, anaesthetists and nurses can improve surgical outcomes in patients coming for elective liver surgery.

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Preoperative malnutrition in the elderly – Who is at risk and its association with more severe postoperative complications and prolonged hospital length of stay

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Background and Goal of Study: Malnourished elderly patients have longer hospital stays and more morbidities than those with normal nutritional state. Fortunately, malnutrition (MN) is potentially modifiable. To date, the prevalence of MN in the preoperative surgical population in Singapore is unknown. MN risk can be rapidly screened using the Malnutrition Universal Screening Tool (MUST). This study aims to assess the prevalence of MN risk in the preoperative elderly surgical population. We also examined factors associated with MN, and the association between MN risk and post-operative complications.

Materials and Methods: This is an audit of 1,033 elderly patients aged 65 years and older undergoing elective surgery at the Singapore General Hospital (SGH), a tertiary hospital, between January and March 2019. Patients were screened preoperatively for MN risk with MUST. Demographic data, comorbidities, operation details, postoperative complications and hospital length of stay (LOS) were recorded. Frailty was scored using the Edmonton Frail Scale; 30-day postoperative complications were scored using the Clavien-Dindo (CD) classification. Crosstabulation and multivariate logistic regression were done to determine the relationship between high MN risk (MUST≥2) and high CD grade complications (CD grade ≥2) or infective complications. Multivariate ANOVA was performed to determine relationship between high MN risk and hospital LOS.

Results and Discussion: 11.9% of the patients were at risk of MN (MUST ≥1). Of this, 4.6% were at high risk (MUST ≥2). General surgery and gynaecological surgery had the highest prevalence of MN risk. (16.8% and 22.3% vs 11.9%, p = 0.001). Higher ASA score, frailty (EFS ≥6), polypharmacy, and poor pre-morbid effort tolerance were associated with MN risk. Patients with high MN risk had higher odds of high CD grade complications compared to those with no risk (aOR 2.2, p=0.04)

and longer hospital LOS (B=1.2, p=0.04) after multivariate adjustment for type and severity of surgery, presence of malignancy, presence of moderate to severe anaemia, CCI, EFS and ASA score. High MN risk was not associated with increased odds of infective complications.

Conclusion: MUST is validated for preoperative screening of MN. Patients with high MN risk have a higher risk of severe post-operative complications and longer hospital LOS. Patients with high comorbidity burden and frailty should be screened for MN so that nutritional optimisation can be sought.

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Risk in surgery: an analysis of several morbidity and mortality risk scores in a Portuguese University Hospital

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Background: There's conflicting literature regarding our perception of the perioperative risk. If clinicians tend to overestimate the benefit of certain treatment, we also may overestimate risk in complex surgical patients. Some international guidelines include risk stratification as part of preoperative assessment. Our goal was to understand which risk scores were best related to the complications for which they were created, in our population.

Methods: We analyse the comorbidities of the various systems. We calculated the risk scores Revised Cardiac Risk Index, Gupta Perioperative Cardiac Risk, Multifactorial risk index for predicting postoperative respiratory failure (Arozullah), ARISCAT Score for Postoperative Pulmonary Complications, P-POSSUM and POSPOM. The outcomes analysed were in-hospital mortality; at 30 days: myocardial infarction (MI) or sudden cardiac arrest (SCA), pneumonia, pulmonary complications, morbidity and mortality; 6 month mortality.

Results and discussion: We collected data from 431 patients submitted to general surgery from March to May 2017. RCRI showed good discrimination in 30-day MI and SCA (AUC: 0.889; p-value: 0.007; CI: 0.742 - 1.000); GUPTA did not discriminate MI or SCA (curve crosses 0.5 and estimates may be biased); ARISCAT did not discriminate for pulmonary complications at 30 days (AUC: 0.646; p-value: 0.073); Arozullah showed reasonable discrimination for predicting postoperative respiratory complications (AUC: 0.704; p-value: 0.013; CI: 0.531 - 0.877); P-POSSUM showed good discrimination in in-hospital (AUC: 0.939; p-value: 0.009; CI: 0.880 - 0.998) and 30-day mortality (AUC: 0.902; p-value: 0.006; CI: 0.822 - 0.9), and reasonable discrimination for 30-day morbidity (AUC: 0.776; p-value: <0.001; CI: 0.680 - 0.872) and 6-month mortality (AUC: 0.730; p-value: 0.027; CI: 0.545 - 0.914); POSPOM showed good discrimination for in-hospital (AUC: 0.862; p-value: 0.031; CI: 0.747 - 0.977) and 30-day mortality (AUC: 0.873; p-value: 0.010; CI: 0.784 - 0.961), and did not discriminate at 6-month mortality (AUC: 0.653; p-value: 0.117).

Conclusion: P-POSSUM and POSPOM discriminated for the outcomes for which they were built, and they are an easy and fast tool to apply in risk assessment. RCRI showed good discrimination and is a simple and highly reproducible risk score. In the respiratory complications we had the most conflicting data: neither of the two scores showed good discrimination of postop pulmonary complications.

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Does the patient have normal nutritive score prior to digestive surgery anesthesia?

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Background and Goal of Study: Nutritive status assessment is one of the most important factors for post-operative recovery. On the other hand, the physiological stress of operation increases the risk of poor nutritional status which is related to poorer outcomes. The aim of this study is to estimate nutritional condition in pre-operative period and its relationship with other pre-operative factors like gender, BMI, ASA and Glasgow index in patient who undergoes gastrointestinal surgery.

Materials and Methods: Pre-operatively we collected general data of 75 patients who underwent gastrointestinal surgery like gender, ASA status, body weight, body height. The nutrition assessment was investigated with two nutritional screening tools: - Royal Marsden nutrition screening; - Mini nutrition assessment short form (MNA-SF). In each patient we calculated Glasgow index which is ratio between CRP and Albumin value.

Results and Discussion: Out of 75 patients in total according to MNA-SF: - 21 (28 %) were detected with malnutrition; - 22 (29.3 %) patients were at risk of malnutrition;