Predicting outcome after major hepatobiliary surgery: Analysis of PQIP data at a high-volume centre

world class expertise local care

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Introduction

Morbidity is common after elective major abdominal surgery, prolongs length of stay and confers excess mortality risk for many years.[1]

Early identification of 'at-risk' patients facilitates share decision-making and targeted perioperative management, but few morbidity models have been externally validated or routinely inform clinical practice

Our aim was to compare the performance of existing risk tools in predicting morbidity and mortality in PQIP patients undergoing major hepatobiliary (HPB) surgery

Methods

Dataset & inclusions: PQIP patients undergoing liver resection the Royal Free Hospital before 1st December 2018

Outcomes: Composite 1 - Clavien-Dindo Grade ≥III morbidity or inpatient mortality. Composite 2 - high-grade morbidity (Clavien-Dindo Grade IV) or inpatient mortality

Statistical analyses: Recalibration of models to test dataset.[2] Discrimination of composite outcome by mortality (SRS, SORT, P-POSSUM) and morbidity (SORT-morbidity and POSSUM-morbidity) models. Reporting area under the receiver operator characteristic curve (AUC), where >0.9 indicates good discrimination; 0.7–0.9, moderate; and <0.7, poor discrimination

Results

Overall 123 patients underwent a hepatic resection (Table 1)

Incidence of composite-1 (Grade ≥III morbidity or inpatient mortality) was 14.8% and incidence of composite-2 (Clavien-Dindo Grade IV or inpatient mortality) 7.3%

With the exception of SORT, discriminatory performance of all tools was poor (Figures 1 & 2). SORT demonstrated moderate discrimination of organ failure or inpatient mortality

Figure 1 Receiver operator characteristic curves for composite 2 (SRS: surgical risk score, P-POSSUM: Portsmouth POSSUM mortality, SORT: surgical outcome risk tool, SORT-m: surgical outcome risk tool for morbidity, POSSUM-m: POSSUM morbidity) p= 0.15

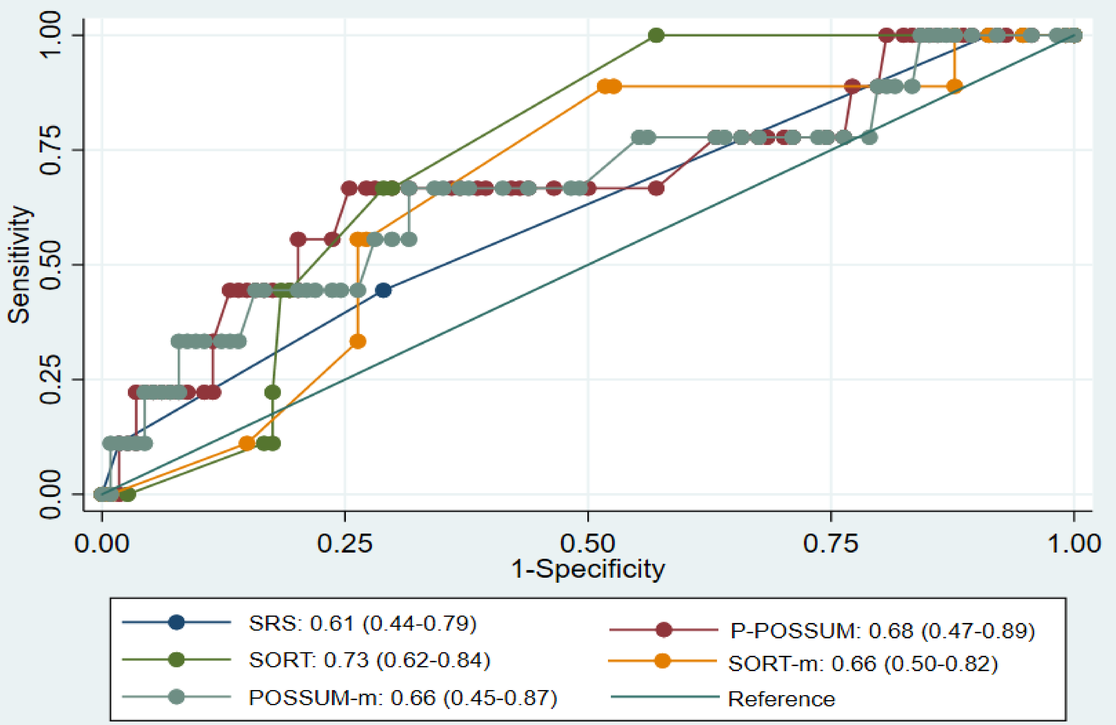
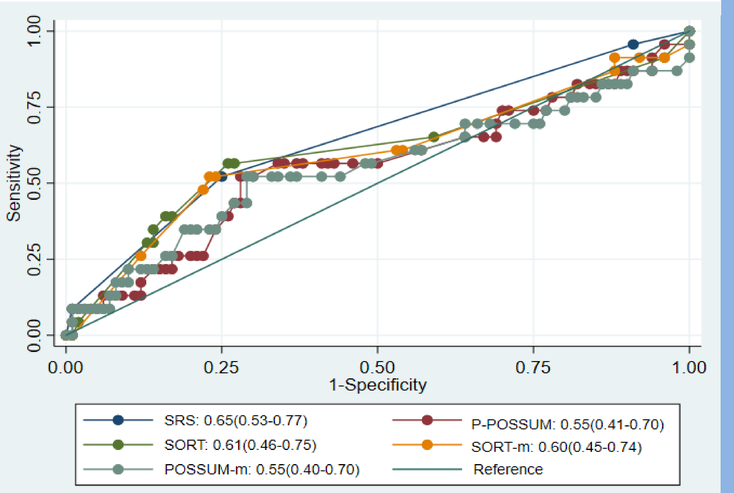


Table 1 Cohort characteristics. (*: Median (interquartile range), ASA-PS: American Society of Anesthesiologists - Physical Status classification)

	n= (%)
Characteristic	
Male	75 (61)
Age	65 (54-70) *
ASA-PS >2	35 (28)
From own home	123 (100)
Outcomes	
Inpatient deaths	5 (4.1)
Clavien-Dindo Grade ≥III morbidity or death	38 (14.8)
Clavien-Dindo Grade IV morbidity or death	9 (7.3)

Figure 2 Receiver operator characteristic curve for Composite 1 (SRS: surgical risk score, P-POSSUM: Portsmouth POSSUM mortality, SORT: surgical outcome risk tool, SORT-m: surgical outcome risk tool for morbidity, POSSUM-m: POSSUM morbidity) p=0.7



Conclusion

Of the tools assessed, only SORT demonstrated better-than-poor discrimination of high-grade postoperative morbidity or inpatient death after liver resection. SORT may therefore be used to pre-emptively identify patients at substantial risk of high-grade morbidity or death, target delivery of augmented perioperative care pathways and reduce overall length of stay after major HPB surgery

References

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2. Steyerberg EW, Borsboom G, van Houwelingen HC, Eijkemans MJC, Habbema JDF. Validation and updating of predictive logistic regression models: a study on sample size and shrinkage. *Statistics in Medicine* 2004; **23**(16): 2567-86.