
Surgical Apgar Score for predicting patient outcome after hepatopancreaticobiliary surgeries

Sir,

We read with great interest the original article titled, “Physiological and operative severity score for the enumeration of mortality and morbidity scoring systems for assessment of patient outcome and impact of surgeons’ and anesthesiologists’ performance in hepatopancreaticobiliary surgery” by Fassoulaki *et al.*^[1] The authors used Physiological and Operative Severity Score for the enumeration of Mortality and Morbidity (POSSUM) and Portsmouth-POSSUM (P-POSSUM), i.e., the Portsmouth modification scores to predict patient outcomes after hepatopancreaticobiliary (HPB) surgeries. We understand the

author’s concern with the data as it is a retrospective, small volume, and single-center study.

However, we would like to mention the meta-analysis published by Chen *et al.* where they also used POSSUM and P-POSSUM as predictors of postoperative morbidity and mortality in patients undergoing HPB surgery.^[2] The authors reviewed 16 eligible studies over a period of 20 years (from 1991 to 2012). The authors concluded that although POSSUM overpredicted the postoperative morbidity after HPB surgeries, P- POSSUM was more accurate in predicting major postoperative events. Wang

Table 1: The 10-point Surgical Apgar Score reproduced after permission from Elsevier

Parameters	0 points	1 point	2 points	3 points	4 points
Estimated blood loss (mL)	>1000	601-1000	101-600	≤100	-
Lowest mean arterial pressure (mmHg)	<40	40-54	55-69	≥70	-
Lowest heart rate (beats/min)	>85	76-85	66-75	56-65	≤55

Source: Gawande *et al.* Occurrence of pathological bradyarrhythmia (including sinus arrest, atrioventricular block of dissociation, junctional, or ventricular escape rhythms) and asystole also receives 0 points for lowest heart rate

et al. published a systematic review by analyzing nine studies and a data of 1652 patients. They arrived at a conclusion that neither POSSUM nor P-POSSUM could provide a significant predictive value for mortality in major pancreatic surgery.^[3] POSSUM in fact overpredicted morbidity in the surgical patients.

We would like to mention the 10-point Surgical Apgar Score (SAS) that was described by Gawande *et al.* in 2007.^[4] SAS is a simple, 10-point scoring system which accurately identifies and predicts a surgical patient who might have adverse perioperative outcomes if the score is low [Table 1]. Since 2007, several retrospectives and prospective studies involving large patient data have been published which has shown that SAS could reliably predict immediate and 30-day postoperative serious events. A patient with a low SAS should be meticulously observed in a dependent unit, and early warning signs should be addressed aggressively. Assifi *et al.* collected retrospective data from 2000 to 2010 of 553 patients who underwent pancreaticoduodenectomy in a high-volume center. They calculated SAS for all patients and analyzed the ability of SAS to predict perioperative morbidity in those patients. They found that SAS could reliably predict perioperative morbidity for patients undergoing pancreaticoduodenectomy.^[5]

POSSUM and P-POSSUM need a lot of investigations such as hemoglobin, urea, white cell count, sodium, potassium, and electrocardiogram. A lot of data (12 physiologic variables and 6 operative variables) need to be entered which makes it cumbersome for clinicians. Surgical events such as peritoneal soiling and multiple surgeries are also important for scoring. Missing or incomplete data are also possible in retrospective analysis. We feel that SAS is a very simple scoring system which has been established as a simple and reliable prognostication tool in the past 10 years. More prospective studies might be required for establishing SAS as a reliable predictor after HPB surgeries.

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Conflicts of interest

There are no conflicts of interest.

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