Archives of Clinical and Experimental Surgery, 2022
VOL 11, NO. 3, PAGE 01-02.

SHORT COMMUNICATION

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Validation of P-POSSUM Score as Mortality Predictor in COVID-19 Positive Patients Submitted to Emergency Digestive Surgery

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ARTICLE HISTORY

Received: 21-Mar-2022, Manuscript No. EJMACES-22-57987; Editor assigned: 23-Mar-2022, PreQC No. EJMACES-22-57987 (PQ); Reviewed: 06-Apr-2022, QC No. EJMACES-22-57987; Revised: 11-Apr-2022, Manuscript No. EJMACES-22-57987 (R); Published: 18-Apr-2022.

About the Study

Emergency surgery is at higher risk of postoperative complications and mortality than elective procedures, due to the clinical deterioration secondary to the acute disease and the lack of a preoperative period to optimize comorbidities and correct organ dysfunction [1]. Different predictive scores for surgical risk have been designed to assign an adjusted risk of postoperative complications and/or mortality in surgical patients (POSSUM and P-POSSUM scores, LUCENTUM tool, NELA score, ACS-NSQIP surgical risk calculator, APACHE-II scoring, among others) [2-5]. They are essential for the outcomes of surgical audits, quality care controls and as a comparative framework (intra- or inter-hospital) of clinical outcomes. These scores can also help to identify "high risk" patients who could benefit from intensified peri and postoperative care, including early postoperative admission in ICU units or even referral to other centers [3,6].

The P-POSSUM score (Portmouth-Physiological and Operative Severity Score for the enUmeration of Mortality and Morbidity), based on 12 preoperative and 6 operative weighted factors, represents a classic and widespread tool (and simple to apply) for estimating postoperative mortality (≤ 30 days) after elective and urgent surgery [7,8]. From the "first wave" of COVID-19, an unexpected increase in postoperative complications and mortality has been recorded in patients co-infected with SARS-CoV-2, probably due to a synergistic immunological dysregulation, hyperinflammatory response to surgery, and need of mechanical ventilation [9]. However, to date, surgeons did not have any prognostic scale specifically validated in emergency surgical patients operated on during the pandemic context, and classical predictive surgical scores had not been tested on COVID-19 positive patients. Since the beginning of the COVID-19 pandemic, multiple non-surgical prognostic scales and algorithms have been designed and validated for patients infected with SARS-CoV-2 virus (4C mortality score, CURB-65 score, Pneumonia Severity Index, MuLBSTA score, COVID-GRAM critical illness risk score, among others) [10]; but all of them are of limited help in the surgical setting.

The "COVID-CIR" multicenter registry includes approximately 5,000 consecutive patients operated on for emergency digestive pathologies in 25 Spanish hospitals during the "first wave" of COVID-19 in Spain (March–June 2020), and during the same period of the previous year [11]. Based on this data, we developed a retrospective cohorts´ study to analyze the predictive capacity of the P-POSSUM score [12]. 30-day mortality of COVID-19 positive patients was 12.9%, greater than the 4.6% of contemporary COVID-19-negative ones or the 3.2% of the control cohort. The P-POSSUM scoring in the COVID-19 positive patient cohort was significantly higher than that calculated in patients not infected by SARS-CoV-2, and then in the pre-pandemic control cohort. The P-POSSUM score showed a good predictive capacity in terms of discrimination (AUC=0.88), calibration (β=0.97), sensitivity (83%) and specificity (81%) [12]. The predictive performance of the P-POSSUM score was equal to or greater than that demonstrated before the COVID-19 pandemic by other surgical prognostic scores [5,6]. Furthermore, the predictive power shown by the P-POSSUM score in the present study was also similar to or even higher than the capacity shown by mortality scales specifically designed for non-surgical COVID-19 infected patients [10].The results confirm the value of the

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P-POSSUM score as a useful tool for estimating postoperative mortality in COVID-19 positive patients undergoing emergency digestive surgery, and for identifying "high risk" patients in whom monitoring and postoperative care should be intensified [12]. As an additional note, we hope that this line of research (based on P-POSSUM score) may contribute to reducing postoperative mortality in patients operated on for emergency digestive pathology, in the present epidemiological context or similar future health challenges.

Acknowledgement

We would like to acknowledge COVID-CIR Collaborative group for their support to complete this study.

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