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Editorial

SAPS II and SAPS III: Have They Outlived Their Role? A Critical Appraisal

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Cardiac arrests and the ensuing deaths following that around the globe are astronomical despite universal efforts in curtailing them. Owing to the heavy budget that the care of post cardio-pulmonary resuscitation (CPR) patients entails, prediction of outcomes in this set of population is of paramount importance. This aspect has been emphasized by various investigators in forwarding clinically acceptable scores in predicting mortality in post CPR patients [1-2]. Similarly, while evaluating ICU performances, the prevalent and acceptable approach is to calculate the ratio of number of deaths observed to the number of deaths by the reference scoring system [3].

Owing to the gravity of the situation, the American Heart Association (AHA) in a consensus statement singled out that SAPS III could possibly serve as a reliable predictor of post CPR mortality. As SAPS II forwarded initially had failed to meet the criteria of a useful predictor, the statement issued by AHA was looked upon with a streak of skepticism and some degree of pessimism. The SAPS II model does not guarantee a perfect fit in a new sample independent from that in which the model was developed. Likewise, the SAPS III fails to take into account the effect of the ICU variable [4]. Poole et al. [5] in a multi-center study conducted on a large number of patients recruited from 103 Italian ICUs observed that both SAPS II and SAPS III were unreliable tools for hospital mortality prediction and could serve to be of moderate significance in discriminating ICU mortality.

Salcicciol et al. [6] have for the first time calculated the predictive value of SAPS III in post CPR patients. The obvious limitations of this study are that it was confined to a single center and had a comparatively small sample size. Thus it is imperative that other centers also re-evaluate the variables in an endeavor to construct a new model for prediction that would be able to underestimate the true predictive error.

This study reveals that both SAPS II and SAPS III are not good predictors in accurately and reliably differentiating post CPR outcome thus necessitating the need for other variables and tools to be employed to achieve the coveted goal of serving as an ideal predictor. In this regard, the authors have suggested five additional variables in evaluating these cases on the assumption that such a fit would be promising. Further studies should preferably incorporate these variables and evaluate the potential role and benefit of the new model in the prediction of ICU mortality.

To implement and introduce a score, it is imperative that the score be initially tested in strictly related subjects and also externally validated. Some argue that lack of an adequate answer in external validation studies in SAPS II

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is due to aging of the score but other studies reveal that SAPS III despite being new was equally unreliable.

Calibration has been emphasized in almost all the studies Calibration is the ability to correctly relate the real probability of an event to its estimated value from external models and is of utmost importance for the assessment of the validity of predictive models having dichotomy variables [6]. Finnazi et al. [7] have demonstrated that both SAPS II and SAPS III models are unreliable tools for hospital mortality. SAPS III however provide more skewed results (as shown by calibration graph obtained by applying GiViTi calibration belt) than SAPS II, indicating that a new score does not necessarily outperform an older one. In an ideal situation, the belt should be congruent on the line of observed mortality= expected mortality.

To reach the peak of Mount Everest, various mountaineers adopted different routes and used different tools under different weather conditions. Each step had its own limitations and hardships. Finally after extensive deliberations and discussing the potential hazards and draw backs of each route, the triumphant step on Mount Everest was launched. This scenario can well be applied to the different models that are currently in vogue to depict ICU and hospital mortality. Since none of the prevailing models have been able to boast optimal reliability for prediction of hospital mortality and at times provide us erroneous information by overestimating the target or the primary outcome which in turn affect our decision making. Perhaps an alteration of the present models by adding some more relevant and concrete variables could possibly enhance the reliability and validity of the new scoring system, thus improving its diagnostic performance and at the same time allowing extrapolation to other settings in predicting hospital mortality.

We are observing elegant studies at different stages of development, validation and enhancement where a host of parameters are given due recognition as being indispensable [8].

In the past there has been an intellectual endeavor on the part of researchers to introduce prognostic models such as APACHE scores, SAPS II, III, and cerebral performance category besides many modifications to serve as reliable tools of discrimination between the survivors and non-survivors. However, it appears that the ideal models are miles away, thus the research in this regard has to be continued with renewed zeal and enthusiasm to solve the enigma of post CPR arrest patients.

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