

PERFORMANCE OF FOUR ALGORITHMS FOR PROBABILITY OF DEATH IN PORTUGUESE PICU'S

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Background: algorithms of probability of death (POD) have been used worldwide to evaluate quality of care delivered by PICUs. Nowadays there are two main algorithms systems, namely PRISM and PIM, each with an original and a recalibrated version (PRISM/PRISM-III and PIM/PIM2). Since March 2002, we have been collecting data from three major PICUs in Portugal to evaluate the performance of POD algorithms in our population.

Material and Methods: gender, admission outcome, diagnostic group and all data required to calculate PRISM, PRISM-III(12h) and PIM, were prospectively collected from all admissions between 01/May/02 and 30/Apr/04. Since 01/May/03 we also collected data to compute the PIM2. PRISM, PIM and PIM2 were calculated according to the algorithms published in the literature. PRISM-III(12h) was computed using PICUEs 3.2.3 software. Discrimination was assessed through the area under the receiver operating characteristic curve (ROC) and calibration through the Hosmer-Lemeshow Chi-square statistic and standardised mortality ratio (SMR).

Results: each PICU contributed with a similar number of patients (396, 345, 412), totalising 1153 admissions. Median age was 41 months and 46% were male patients. Median length of stay was 2.7 days. Mortality rate during PICU stay was 10%. The results for PRISM, PRISM-III(12h), PIM and PIM2 were respectively: ROC(CI95%) - 0.89(0.85-0.92), 0.90(0.87-0.93), 0.83(0.79-0.87) and 0.89(0.84-0.93); Hosmer-Lemeshow Chi-square statistics (8df) – 25.5(p=0.001), 40.1(p<0.001), 35.5(p<0.001) and 25.3(p=0.001); and SMR - 0.87, 1.16, 1.49 and 1.74.

Conclusions: discrimination between death and survival was good for all algorithms, but calibration was poor for all of them, being best for PIM2 and PRISM. The opposite direction of SMR in these two algorithms make difficult to choose which performs best in the Portuguese population. These results, associated to the trend shown in recalibration of PRISM and PIM, makes us believe that case-mix is an important factor to consider when evaluating POD models.