DEVELOPMENT AND VALIDATION OF A NEW SCORE SYSTEM TO PREDICT IN-HOSPITAL MORTALITY AFTER HIP FRACTURE: THE CAREGGI SCORE

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Aim: To develop and validate a new predictive score system to assess in-hospital mortality risk in patients with hip fracture who need surgical intervention.
Material-Methods: In development phase we retrieved electronic record of 756 consecutive patients aged>70 years referred to for hip fracture between 1st January and 31th December 2016. Demographic, clinical and laboratory data were inserted into a univariate logistic regression analysis and the statistically significant results parameters inserted into a multivariate logistic regression analysis in order to find factors independently related to in-hospital mortality. In the validation phase were prospectively included 206 patients from 1 April to 31 July 2019. For each patient the developed mortality risk score (Careggi score) was calculated at admission. The development phase showed male sex, motility before trauma (pointed 0 to 3- 0 bedridden, 3 able to walk >100 meters without aid), atrial fibrillation and renal failure independently related to in-hospital mortality. In order to assign to each patient a risk score, the numeric value of each variable was multiplied times their own logistic coefficient (in turn multiplied by 10 in order to round it to the nearest integer), and the sum of these results gave, for each patient, a risk score of in-hospital death. Namely, gender was multiplied by 12, previous mobility by -7, AF by 15 and renal failure by 12. All variables were dichotomic (0 or 1) except for previous mobility which ranged 0 to 3; therefore the score ranges -21 to 39. To avoid negative numbers, a constant (25) was then added to this score, so that it can range 4 to 64.
Results: Survivors had a median score 16 (4-23) whereas non survivors had 30 (28-38), p<0.001. A ROC curve was then plotted and with the Youden's method an optimal cut-off of >20 was found to better discriminate patients with worse prognosis. This cut-off yielded 88% sensitivity (95%CI 69 to 97%) and 74% specificity (95%CI 71 to 77%). In the population of the validation phase, in-hospital mortality was 2.9% (6 out of 206 patients). 5/6 patients deceased had a score > 20 in comparison to only 1 out of 200 patients discharged alive. Careggi score was compared with Nottingham hip fracture score and showed a better predictive value. A simple predictive score system may be useful to assess the risk of mortality in patients undergoing hip fracture surgery.
Conclusions: Mortality in patients undergoing hip fracture surgery is close to 5% . Identification of patients at high risk of mortality during hospitalization may be helpful to avoid futility in treating these patients.