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Quantitative CT in outcome prediction in TBI

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Resumen

Introduction: Different imaging findings on the admission or worst head computed tomography have been included as one of the major determinants of head injury prognosis. The objective of this study was to determine the prognostic capability and reliability of a semi-automated quantitative method for estimating the amount of bleeding in different intracranial compartments after severe head injury.

Methods: All patients admitted to our centre that had suffered traumatic TBI and that fulfilled the following criteria 1) patient aged 15 or over; 2) Glasgow Coma Scale Score (GCS) of 8 or less after non-surgical resuscitation at admission or GCS deterioration to 8 or less within 48h after trauma, from January 2010 to October 2016 were included in the study. The worst CT performed in the first 24 hours after head injury was used for the analysis. All CTs were semi-quantitatively analysed using Analyze software. A subset of 100 patients was also studied by two independent observers in order to check for inter-observer reliability both for quantitative measurements and qualitative classification of CT findings. Outcome was assessed by means of dichotomised GOS. Logistic regression was used to determine features related to prognosis and ROC curves in order to determine the discriminatory capacity of models using quantitative or qualitative features.

Results: A total of 550 patients were included in the analysis. Average time to complete the quantification of bleeding in each patient was below 15 minutes. Quantitative CT features show superior inter-observer reliability than qualitative ones and provide better prognostic accuracy of outcome when used in combination with other prognostic factors in logistic regression analysis.

Conclusions: Although time consuming and still dependant of an observer, quantitative estimation of the amount of bleeding in head injury patients seems to be a promising prognostic tool.