Category: Cardiovascular: cardiac arrest\CPR

A99 - Serum gfap and uch-l1 for the prediction of long term neurological outcome in comatose out-of-hospital cardiac arrest patients

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Introduction:
The prognostication of neurological outcome in comatose out-of-hospital cardiac arrest (OHCA) patients is an integral part of post cardiac arrest care. Biochemical biomarkers released from cerebral cells after hypoxic-ischemic injury represent potential tools to increase accuracy in predicting outcome after OHCA. Currently, only neuron-specific enolase (NSE) is recommended in European prognostication guidelines. In this study, we present the release dynamics of GFAP and UCH-L1 after OHCA and evaluate their prognostic performance for long-term neurological outcome in OHCA patients.

Methods:
Serum GFAP and UCH-L1 were collected at 24, 48 and 72 h after OHCA. The primary outcome was neurological function at 6-month follow-up assessed by cerebral performance category scale (CPC), dichotomized into good (CPC 1-2) and poor (CPC 3-5). Outcome prognostic performance was investigated with receiver operating characteristics (ROC) by calculating the area under the receiver operating curve (AUROC) and compared to NSE.

Results:
717 of 819 included patients had at least one serum GFAP or UCH-L1 value at 24, 48 or 72 h after OHCA. GFAP and UCH-L1 levels were significantly elevated in patients with poor outcome. GFAP and UCH-L1 discriminated excellently between good and poor neurological outcome at all time-points (AUROC GFAP 0.88-0.89; UCH-L1 0.86-0.87) and overall predictive performance measured by AUROC of GFAP and UCH-L1 was superior to NSE (AUROC 0.76-0.85). However, the ROC at the highest specificities of UCH-L1 and GFAP overlap those of NSE and comparing the sensitivities for UCH-L1 and GFAP with those of NSE for the highest specificities (>95%) revealed higher sensitivities for NSE than for UCH-L1 and GFAP at 48 and 72 h.

Conclusion:
GFAP and UCH-L1 predict poor neurological outcome in patients after OHCA excellently and with a higher overall accuracy than NSE, but both biomarkers perform inferior to NSE at specificities over 95% at 48 and 72 h limiting their clinical use to guide decisions on prognosis.

Image:
A-C, Receiver-operating characteristic analyses for prediction of Cerebral Performance Category Scale 1-2 vs CPC 3-5 at 6-months follow-up for serum samples collected at 24, 48 and 72 hours. The enlarged sections in B and C show the overlap of GFAP, UCH-L1 and NSE at high specificities at 48 and 72 hours.