Routine Laboratory Indices Predict Neurological Recovery after CPR in Patients Treated with Hypothermia

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Aims: To identify laboratory tests that may assist in predicting favorable neurological outcome in post cardiac arrest patients treated with therapeutic hypothermia.

Materials and methods: The data of 41 patients who had undergone therapeutic hypothermia due to sudden death and return of spontaneous circulation (ROSC) between May 2008 and November 2011 were reviewed. Patients were divided into two outcome groups depending on their Cerebral Performance Category (CPC) scale: CPC scale of 1-2 was defined as favorable outcome, CPC scale of 3-5 was defined as poor outcome. Mild TH (32-340) was implemented on all patients and rewarming began after 24 hours of cooling by a rate of 0.30C per hour. We collected the values of the following variables during admission to the ICCU, during the first 72 hours since admission and one week after admission: WBC, %PMN, PLT, pH, Na, K, glucose, CPK, INR, Cr, urea, ALT, AST, troponin. The results were analyzed and compared between the two outcome groups using the student's t test and ANOVA.

Results: When comparing the two outcome groups upon admission to the ICCU the mean values of the following variables were significantly lower in the favorable outcome group as opposed to the poor outcome group: glucose (232 vs. 303 respectively, p=0.011) and ALT (115 vs. 204 , p=0.038). A non-significant trend was observed in the mean values of %PMN (60% vs. 71%, p=0.055). When comparing the variables during the 72 hours after admission to the ICCU, the trend of the mean values of %PMN and glucose differed significantly between the two outcome groups. Furthermore, the mean values of glucose and urea were significantly lower in the favorable outcome group than in the poor outcome group. One week following admission to the ICCU, the mean values of %PMN were significantly lower in the favorable outcome group as opposed to the poor outcome group (70.3% vs. 83.2%, p<0.001). Mean value of WBC one week after admission was lower in the favorable outcome group as opposed to the poor outcome group (statistically non-significant trend).

Conclusion: The overall results of this study suggest that the acute stress reaction to the initial insult, as expressed by various laboratory indices, is more extreme in patients with poor neurological outcome. We thus believe that these indices may be utilized when assessing the future prognosis of these patients. Further, larger cohorts and prospective studies are warranted for validation of this hypothesis.

<IMAGE02>