

RETROSPECTIVE APPLICATION OF EUROPEAN RESUSCITATION COUNCIL ALGORITHM IN A COHORT OF POST CARDIAC ARREST PATIENTS

Dott.ssa CECILIA BIANCHI (1), Dott.ssa CHIARA MAGGI (1), Dott.ssa ANNA COPPO (2), Dott.ssa ALICE GRASSI (2), Dott. ENDRIT SULMINA (2), Dott. GIUSEPPE FOTI (2), Dott. LEONELLO AVALLI (2)

(1) Università degli Studi di Milano-Bicocca, Piazza dell'Ateneo Nuovo, 1, Milano, Mi/lombardia, Italia.

(2) ASST Monza, Ospedale San Gerardo, via pergolesi 33, Monza, Italia.

Argomento: Trauma e arresto cardiaco

Introduction: About 40-70% of cardiac arrest (CA) survivors develop irreversible cerebral damage. In 2014 the European Resuscitation Council (ERC) elaborated the most frequently used algorithm for prognostication in comatose survivors of CA. It considers two steps to predict a poor neurological outcome and a FPR < 5% is suggested to be acceptable. First step considers contemporary absence of pupillary and corneal reflexes or the absence of N20 SSEP. The second considers the coexistence of two or more criteria between status myoclonus, high NSE levels, cerebral damage on neuroimaging and unreactive EEG pattern.

Objective: Our aim was to evaluate the ERC prognostic factors in our cohort of patients, in order to reduce False Positive Ratio (FPR) and identify strenghts and weaknesses of this algorithm.

Methods: A group of 128 comatose patients with GCSm ≤ 2 at 72 hours after CA were retrospectively studied. With reference to ERC algorithm N20 SSEP, and pupillary and corneal reflexes were evaluated at 72 hours from ROSC; in addition, NSE, EEG pattern and neuroimaging were applied between 72 hours and 5 days.

Neurological recovery was assessed using Cerebral Performance Categories (CPC) at 6 months.

Univariate analysis was performed to correlate prognostic factors and neurologic outcome.

Results: Our findings demonstrate that pupillary reflex, bilateral absence of SSEP N20 wave and unreactive EEG reactivity singularly considered have a FPR<5%, whereas corneal reflexes, NSE and neuroimaging have a FPR<5% if associated with another predictors. With regard to biomarkers our data demonstrate that blood values of NSE superior to 72 $\mu\text{g/L}$ are associated with a sensibility of 60% and a specificity of 90% to predict a poor neurological outcome.

Conclusion: Our results confirm the validity of the prognostication algorithm suggested by ERC, and underscore the importance of multimodal assesments to effectively reduce FPR in comatose survivors of CA prognostication.

CORRELATION BETWEEN ERC NEGATIVE PROGNOSTIC FACTORS AND POOR NEUROLOGICAL OUTCOME

PROGNOSTIC FACTOR	p-value	FPR %
Bilateral absence of pupillary reflexes	< 0,0005	0
Bilateral absence of corneal reflexes	< 0,0004	13
Bilateral absence of SSEPs N20 wave	< 0,0297	0,0055
Brain injury at neuroimaging	<0,2089	36
EEG pattern (BS or unreactive SE)	< 0,0001	0
NSE ≥ 60 $\mu\text{g/L}$	< 0,0001	24
Bilateral absence of pupillary reflexes + Bilateral absence of corneal reflexes OR Bilateral absence of SSEP N20 wave	< 0,0008	5,5
EEG pattern (BS or unreactive SE) + EEG pattern (BS or unreactive SE)	0,0054	0

LEGENDA

SSEPs= somatosensory evoked potentials

BS= burst suppression

SE=status epilepticus

NSE=neuron specific enolase