Caspase 3

Caspase-3 is a caspase protein that interacts with caspase 8 and caspase-9. It is encoded by the CASP3 gene. CASP3 orthologs have been identified in numerous mammals for which complete genome data are available. Unique orthologs are also present in birds, lizards, lissamphibians, and teleosts.

Propofol, isoflurane, sevoflurane, or desflurane have similar effects on CSF and serum caspase-3. The reduction of intraoperative CSF caspase-3 levels suggests a possible role for general anesthesia in neuroresuscitation by slowing the neuronal apoptotic pathway [1)].

Circulating caspase-3 levels at 24 h of ischemic stroke were found to be associated with poorer functional neurological outcome in a previous study.

The aim of a study of Lorente et al., was to determine whether there is an association between serum caspase-3 levels and early mortality in patients with malignant middle cerebral artery infarction (MMCAI).

They included patients with MMCAI defined as computer tomography showing ischemic changes in more than 50% of the middle cerebral artery territory and Glasgow Coma Scale ≤ 8. Serum caspase-3 levels at days 1, 4, and 8 of MMCAI were determined.

Non-surviving MMCAI ($n = 34$) showed higher serum caspase-3 levels at days 1 ($p < 0.001$), 4 ($p = 0.001$), and 8 ($p = 0.01$) than surviving patients ($n = 34$). We found that the area under the curve of serum caspase-3 levels for prediction of mortality at 30 days was 88% (95% CI = 78-95%; $p < 0.001$). Multiple logistic regression showed that serum caspase-3 levels were associated with 30-day mortality (OR = 51.25; 95% CI = 8.30-316.31; $p < 0.001$).

The novel and more important findings of the study were that high serum caspase-3 levels were associated with mortality in MMCAI patients [2)].

The expression of caspase 3 and HAX 1 after cerebral contusion has time sequential regularity, which may provide new evidence for forensic diagnosis of cerebral contusion interval [3)].

1)
Balasubramanian M, Kuberan A, Rawat A, Dhandapani S, Panda N, Kumar A, Sahoo AK, Kumar M, Sharma T, Garcia PS, Bhagat H. Effect of General Anesthetics on Caspase-3 Levels in Patients With Aneurysmal Subarachnoid Hemorrhage: A Preliminary Study. J Neurosurg Anesthesiol. 2019 Oct 9. doi: 10.1097/ANA.0000000000000648. [Epub ahead of print] PubMed PMID: 31599811.
2)
Lorente L, Martín MM, Pérez-Cejas A, González-Rivero AF, Sabatel R, Ramos L, Argueso M, Solé-Violán J, Cáceres JJ, Jiménez A, García-Marín V. Serum Caspase-3 Levels and Early Mortality of Patients with

Malignant Middle Cerebral Artery Infarction. Neurocrit Care. 2019 May 21. doi: 10.1007/s12028-019-00739-y. [Epub ahead of print] PubMed PMID: 31115825.

3) Li ZR, Teng DH, Dong GK, Yin WJ, Cai HX. [Expression of caspase-3 and HAX-1 after cerebral contusion in rat]. Fa Yi Xue Za Zhi. 2015 Feb;31(1):7-10, 14. Chinese. PubMed PMID: 26058125.