

Postmortem Interval Estimation by Evaluating Saposin D Levels and Morphological Alterations in Hippocampal Neurons

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Abstract

Background: The correct estimation of the time of death is critical in the field of forensics and legal medicine, and often determines the outcomes of criminal investigations. Current postmortem interval (PMI) estimation methods involve the evaluation of physical, chemical, biological, and histological postmortem changes; however, their accuracy is limited.

Aims, Study design and Methods: In this study, we used rat brains to characterize postmortem alterations in the levels of prosaposin (PSAP) and its degradation product saposin D, as well as morphological changes in the hippocampus. Furthermore, we used fluorescent microscopy and observed profound morphological alterations in hippocampal pyramidal neurons after death.

Results: We found that PSAP levels decreased after death, whereas saposin D levels increased. Morphological alterations prolonged in hippocampal pyramidal neurons up to 7 days after death. Conclusion: These findings suggest that morphological alterations in the hippocampus and the PSAP and saposin D levels may improve the accuracy of PMI estimation.

Key words: Postmortem interval, MAP2, Prosaposin, Immunohistochemistry, Western blotting