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Abstract

Upon review of the literature, extensive disagreement was found as to the usefulness of vitreous humor potassium concentration as a predictor of the postmortem interval (PMI). A pilot study of 1427 cases was performed to address this problem. The requisite statistical analysis for the prediction of PMI is inverse prediction. The 95% inverse prediction interval was found to be approximately ±20 h. The linear regression equation for the data was $y = 0.238x + 6.342$, with a coefficient of determination (r^2) of 0.374. This r^2 value means that 62.6% of the variation of potassium is unaccounted for by the variation in PMI. Further studies are required to attribute this unaccounted variation to quantifiable factors. This would narrow the inverse prediction interval and enable vitreous potassium to be a useful aid in the prediction of PMI.

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Therefore, Vitreous humor potassium levels can be a good method of determining time since. Different hypotheses have been proposed for the rise in vitreous potassium levels with time after death. Vascular choroid and retinal cells might be the source of this potassium influx[6-10]. According to Naumann et al[11] the influx may be due to the autolysis of cell membranes. Postmortem chemistry of the vitreous body in man. AMA Arch Ophthalmol 1959;62:356–62. [12]. Madea B, Henssge C, Honig W, Gerbracht A. References for determining the time of death by postmortem vitreous humour. Forensic Sci Int 1989;40:231–43. [13]. Madea B, Kreuser C, Banaschak S. Postmortem biochemical examination of synovial fluid––a preliminary study. Post-mortem interval (PMI) is the time elapsed between death of a person and the time of autopsy [23]. Post-mortem chemistry may essentially contribute in the determination of the cause of death when the pathophysiological changes involved in the death process cannot be detected by morphological methods (e.g. diabetes mellitus, alcoholic ketoacidosis and electrolytic disorders) [25]. Applications. Electrolytes. Post-mortem levels of vitreous electrolytes are dependent on the effects of cellular hypoxia, which lead to an increase in the cell membrane and blood vessel wall permeability, and the reduction of Adenosine Triphosphate (ATP), preventing electrolyte pumps from maintaining physiological cell membrane electrical gradients.