



## ESTIMATION OF POSTMORTEM INTERVAL BY MEASURING LEVEL OF SODIUM IN CADAVERIC SYNOVIAL FLUID

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**ABSTRACT**

**Background-** In the present study analysis of changes in level of sodium in cadaveric synovial fluid is done, which is correlated with increasing postmortem interval and this study have not been done in south east region of Rajasthan so far.

**Methods-** This study was carried out in department of Biochemistry in association with department of Forensic Medicine and Toxicology, Jhalawar Medical College, Jhalawar. This study was done on 50 cases with known time of death who was brought in the mortuary of department of Forensic medicine and Toxicology for autopsy. The information regarding time of death were collected from hospital records. Ethical permission has been taken from college ethical committee.

**Results-** No significant difference exist for synovial sodium concentration in the same pair of knee joint at the identical postmortem interval.

**Conclusion-** Sodium Ion concentration in synovial fluid shows decline in its level with increasing postmortem interval but we could not correlate this decrease with postmortem interval so it is statistically insignificant.

**KEYWORDS :** Potassium, Death, Sodium.**INTRODUCTION**

Postmortem interval is the time between the death and of postmortem examination of a dead body. This is important in knowing when the crime was committed.

Various studies conducted till now have well established that analysis of vitreous humour is time honoured. But vitreous is useless when dealing with eye trauma, ocular disorders, when head or eyes are missing, in mutilated bodies etc.

Measurements of biochemical levels in synovial fluid have some advantages over those of blood and cerebrospinal fluid. The most obvious is easy sampling. Similar to the vitreous humour, synovial fluid is isolated and well protected anatomically by the cells lining the synovial membrane and is usually well preserved at Post mortem, less subjected to contamination and putrefactive changes and biochemical changes occur slowly as compared to blood or cerebrospinal fluid. Sodium is the most commonly used component in post-mortem biochemistry.<sup>1,3</sup>

**MATERIALS AND METHODS**

This study was carried out in department of Biochemistry in association with department of Forensic Medicine and Toxicology, Jhalawar Medical College, Jhalawar. This study was done on 50 cases with known time of death who was brought in the mortuary of department of Forensic medicine and Toxicology for autopsy. The information regarding time of death were collected from hospital records. Ethical permission has been taken from college ethical committee.

**The exclusion criteria were:-**

All the cases where the time of that was unknown.  
Body in advanced stage of decomposition.  
The extracted sample is cloudy, turbid or hemorrhagic in nature.

Cases of joint disease/deformity. (Osteoarthritis, Rheumatoid arthritis etc)

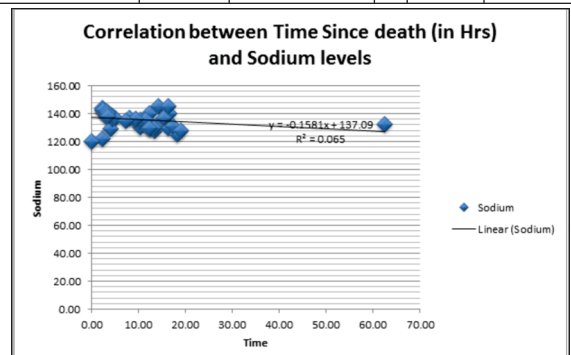
Cases of knee joint injury.

When amount is less than 0.5 ml.

In present study synovial fluid samples were obtained from both knee joint should be examined immediately or within a few hours after arthrocentesis<sup>4,5</sup>. So the sample were immediately sent to Biochemistry lab for analysis. Samples were analysed on BECKMAN COULTER AUTOANALYZER. If immediate analysis was not possible then the samples were stored at 4 degree centigrade for analysis on the very next working day.

**RESULTS****Table 1: Correlation between Time since death (in Hrs) and Sodium**

	Mean	Std. Deviation	N	r value	P value
Time Since death (Hrs)	9.1192	9.35234	50		
Sodium Right	135.6880	5.79305	50	-0.256	0.073
Sodium Left	135.6160	5.80624	50	-0.254	0.075
Sodium	135.6520	5.79842	50	-0.255	0.074

**DISCUSSION**

One of commonest requirements of postmortem examination is determination of postmortem intervals. Estimation of time

since death helps in including and excluding the suspects and culprits and in conforming the statement of suspects. It is also useful in civil cases such as inheritance of property, insurance claims etc. Vitreous humour chemistry is used for postmortem analysis since serum values of many components are thought to be reflected in vitreous humour and to be stable for a prolonged postmortem interval. A similar isolated compartment to vitreous humour is synovial fluid which up to now was hardly used for postmortem chemistry<sup>6</sup>. As synovial fluid is more protected and less prone to burns or atmospheric variations in comparison to other body fluids. Synovial fluid might be helpful in estimating postmortem interval with much desired accuracy.

The present study shows that there is no statistically significant difference in the levels of synovial sodium concentration between the two knee joints of body. Our findings are consistent with result of Angayarkanni<sup>6</sup> S (2016) and Srettabunjong<sup>7</sup> S et al (2019). They observed no statistically significant difference in biochemical constituents in between two knee joints. This finding suggests that either side of knee can be solely used for forensic application.

### CONCLUSION

Sodium Ion concentration in synovial fluid shows decline in its level with increasing postmortem interval but we could not correlate this decrease with postmortem interval so it is statistically insignificant.

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