

Can the Spread of Spinal Anaesthesia be changed with Serum and Cerebrospinal Fluid Sodium Concentrations?

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In spinal anaesthesia, the cerebrospinal fluid (CSF) density has a direct relationship with the spread of anaesthetic agent. The CSF density is determined by the CSF sodium (Na^+) concentration. Therefore, the changes of CSF Na^+ may have an effect on spread of spinal anaesthesia.

This study was designed to detect the relationship between CSF Na^+ and the spread of spinal anaesthesia, and to detect any relationship between serum Na^+ and CSF Na^+ .

In this cross sectional study, women ($n = 60$) with a singleton pregnancy of at least 36 weeks gestation who were scheduled to undergo elective Caesarean delivery under spinal anaesthesia were randomly selected. When spinal anaesthesia was performed, CSF and venous blood were collected to determine the Na^+ levels using atomic absorption spectrophotometry. The time taken to achieve the maximum sensory level, the quality motor block, and the changes of blood pressure and heart rate were recorded. Results were expressed as mean \pm standard deviation depending on the variable type. Pearson correlation coefficient was used for statistical analyses ($\alpha = 0.05$).

There was a weak positive correlation between serum Na^+ concentration and CSF Na^+ concentration ($r = 0.308$; $p = 0.028$). Further, there was a weak negative correlation between CSF Na^+ concentration and time taken to achieve maximum sensory level ($r = -0.305$; $p = 0.03$). There were weak negative correlations between CSF Na^+ concentration and time taken to achieve a maximum systolic blood pressure drop ($r = -0.327$ $p = 0.037$) and diastolic blood pressure drop ($r = -0.376$ $p = 0.014$).

In conclusion the findings indicate that there is a significant relationship between serum Na^+ and CSF Na^+ concentration. Further, the increase in CSF Na^+ concentration will facilitate in achieving a quick sensory block.