

Pleth Variability Index [PVI] based Intraoperative Fluid Management in Head and Neck Free Flap Reconstructive Surgeries

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Introduction: Head and neck reconstructive surgeries involving microvascular free tissue transfer (free flap) poses a major challenge in achieving good cosmetic and functional outcome. Intraoperative fluid administration may be an important determining factor for successful outcome. Static parameters like CVP, MAP, HR for intraoperative fluid administration may not be reliable. PVI is a dynamic noninvasive parameter for intraoperative fluid administration and easily obtained by pulse co-oximeter derived value. PVI enables goal directed tailor made fluid administration preventing fluid overload preventing possible tissue oedema, thrombus formation and flap failure.

Purpose of the Study: To study PVI based goal directed fluid administration in long duration specialized surgeries and compare the outcome with that of Body mass index (BMI) based fluid therapy.

Methodology: A randomized prospective study on eighty patients of head and neck surgery involving free flap of four to five hour duration was conducted, one group of forty patients receive fluid therapy based on body weight i.e. 6 - 8 ml intravenous fluid/kg of body weight i.e. 6-8ml intravenous fluid/kg of body weight. Another (study) group of forty patients received intraoperative fluid therapy based on pulse oximetry derived PVI value (range 4 - 11).

Data Collected: MAP, total crystalloid and colloids transfused, urine output, thromboelastography parameters [R, K, ALPHA, MA and LY30], Blood lactate levels in both groups. Categorical data on each parameter obtained through classification analysed using cross tabulation procedure and Chi-square test of independence to study association of study groups and variables. The scale variables were compared between two groups using independent sample 't' test. For test of significance cut off 'p' value was taken as 0.05.

Findings: The PVI group data results showed significantly less total fluid administration, normal Blood lactate levels and Thromboelastography parameters within normal range compared to patients in group receiving intraoperative fluid based on body weight, which was statistically significant.

Significance: Adequate tissue perfusion and prevention of hypocoagulability and hypercoagulability in the study [PVI]group may help in better microvascular free flap outcome.

Conclusion: Pleth variability Index may be a good alternative for goal directed intraoperative fluid management avoiding fluid overload, is non-invasive requiring minimum space in operating room. We also recommend routine Thromboelastography in this group of patients at the end of surgical procedure as a guide to assess coagulation status.