

The Correlation between Inferior Vena Cava Diameter Measured by Ultrasonography and Central Venous Pressure

*Hans Vaish**, Virendra Kumar, Rama Anand, Viswas Chhapola, Sandeep Kumar Kanwal
Lady Hardinge Medical College, Kalawati Saran Children Hospital, New Delhi, India

Abstract

Objective: To find a correlation between inferior vena cava (IVC) diameters, IVC compressibility index (CI) and central venous pressure (CVP).

Methods: Prospective observational study was done at pediatric intensive care unit (PICU) of Kalawati Saran Children's Hospital (KSCH). Fifty children aged 5-18 y, presenting with shock were enrolled for the study. IVC diameters, CI and relevant clinical data were noted at enrollment, 30 min, 1 h, 6 h, and 12 h. Central line was placed at the time of admission.

Results: Of 50 children enrolled, 28 were boys, with a mean age of 11 y. More than 80% of cases were diagnosed as septic shock. Mean maximum and minimum IVC diameter of 8.3 ± 2 mm and 3.7 ± 1.7 mm, respectively CI $58.2 \pm 7\%$ and CVP of 5.4 ± 1.5 cm of H₂O was observed at admission. CVP and IVC diameters showed a serial improvement with treatment; CI showed a serial decrease with treatment. Heart rate (HR) and systolic blood pressure (SBP) also showed a serial improvement at 12 h ($p < 0.05$). CVP showed a positive correlation with IVC diameter ($r +0.312$; $p < 0.05$), and a negative correlation with CI ($r -0.343$; $p < 0.05$).

Conclusions: Effective fluid resuscitation improves IVC diameters with a decrease in CI. IVC diameter has a positive correlation to CVP and CI has a negative correlation to CVP.

Keywords: CVP Emergency Bedside ultrasonography Inferior vena cava diameter Shock evaluation

Author Biography: The author has done his MBBS from Maulana Azad Medical College, New Delhi. Thereafter completed his Post graduation in Pediatrics from Kalawati Saran Children Hospital, Lady Hardinge Medical College, New Delhi. Author also completed his fellowship in Pediatric Emergency and Critical Care from Sir Gangaram Hospital, New Delhi. Author is presently running a Private Hospital in Dehradun, India by the name of Meher Hospital. Meher Hospital is a Tertiary care hospital for Mother & Child care with a well-equipped PICU and NICU.