

However, no study has yet determined the effect of pneumoperitoneum on cross-sectional area (CSA) of central veins by ultrasonography during laparoscopic cholecystectomy” Pinar et al (2016).

Abstract:

BACKGROUND: Increased central venous pressure secondary to an increase in intraabdominal pressure has been reported during laparoscopic surgery. However, no study has yet determined the effect of pneumoperitoneum on cross-sectional area (CSA) of central veins by ultrasonography during laparoscopic cholecystectomy. Herein, we aimed to quantify changes in CSAs of internal jugular (IJV) and subclavian veins (SCV) by ultrasonography during this surgery.

METHODS: This study included 60 ASA I-II patients scheduled for laparoscopic cholecystectomy surgery under general anesthesia. Pneumoperitoneum was performed with CO₂ at 12 mmHg. The CSAs of right IJV and right SCV were measured using a 6 Mhz ultrasonography transducer in supine and neutral positions before anesthesia induction (T1), 5 min after connecting to mechanical ventilator (T2), 5 min after creation of pneumoperitoneum (T3), at the end of pneumoperitoneum (T4), and 5 min after desufflation and before extubation (T5) both at end-expiration and end-inspiration.

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RESULTS: The comparison of IJV CSA at inspiration showed significant increase in T3 value compared to T2 value ($p < 0.001$). Similarly the expiratory measurements of IJV CSA demonstrated significant increase in T3 value compared to T2 value ($p < 0.001$). The comparison of inspiratory CSA measurements of SCV showed significantly increased in T3 ($p = 0.009$) than T2 value. In expiratory measurements there was a significant increase in T3 ($p = 0.032$) value compared to T2. All measurements of IJV and SCV SCAs both end-inspiration and end-expiration T5 values significantly decreased compared to T4 values ($p < 0.001$).

CONCLUSIONS: Pneumoperitoneum with an intraabdominal pressure of 12 mmHg produces significant increases in IJV and SCV CSAs during laparoscopic cholecystectomy procedure. We believe that this finding may enhance our understanding of pneumoperitoneum-induced hemodynamic changes and facilitate catheterization attempts.

TRIAL REGISTRATION: Date of registration 21/07/2016, ISRCTN Registry (No: ISRCTN15164056 , registered retrospectively).

Reference:

Pınar, H.U., Doğan, R., Konuk, Ü.M., Çifci, E., Duman, E., Karagülle, E., Türk, E. and Karaca, Ö. (2016) The effect of pneumoperitoneum on the cross-sectional areas of internal jugular vein and subclavian vein in laparoscopic cholecystectomy operation. BMC Anesthesiology. 16(1), p.62.

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