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Original Contribution

Role of inferior vena cava diameter in assessment of volume status: a meta-analysis

Agarwal Dipti MBBS ^a ... Subhash Chandra MD ^c  

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Abstract

Background and Objective

Hypovolemic shock is an important cause of death in the emergency department (ED). We sought to conduct a meta-analysis to quantify existing evidence on sonographic measurement of inferior vena cava (IVC) diameter in assessing of volume status adult ED patients.

Methods

A search of 5 major databases of biomedical publication, EMBASE, Ovid Medline, evidence-based medicine (EBM) Reviews, Scopus, and Web of Knowledge, was performed in first week of March 2011. Studies meeting the following criteria were included: (1) prospectively conducted, (2) measured IVC diameter using ultrasonography,

(3) inpatients under spontaneous ventilation, and (4) reported IVC diameter measurement with volume status or shock. Article search, study quality assessment, and data extraction were done independently and in duplicate. Mean difference in IVC diameter was calculated using RevMan version 5.5 (Cochrane collaboration).

Results

A total of 5 studies qualified for study eligibility from 4 different countries, 3 being case-control and 2 before-and-after design, studying 86 cases and 189 controls. Maximal IVC diameter was significantly lower in hypovolemic status compared with euvolemic status; mean difference (95% confidence interval) was 6.3 mm (6.0-6.5 mm). None of the studies blinded interpreters for volume status of participants.

Conclusion

Moderate level of evidence suggests that the IVC diameter is consistently low in hypovolemic status when compared with euvolemic. Further blinded studies are needed before it could be used in the ED with confidence.



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