

Effectiveness of single-session POCUS teaching on JVP assessment: a med ed project

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Introduction

Point-of-care ultrasound (POCUS) has been integrated in an array of medical fields, most notably in emergency medicine and procedural practices such as central line insertions and thoracentesis¹. However, its implementation in internal medicine has not been widely adapted nor standardized. Internal medicine programs that have integrated mandatory POCUS training into their curriculum have shown success in improving resident's comfort level and knowledge, though many barriers remain including restraints in time and equipment available²⁻⁴. JVP assessment in the wider field of POCUS is an easy-to-learn and quick skill. Moreover, it has gained an increasing amount of evidence supporting its high sensitivity and specificity in assessment of fluid status⁵.

We aim to assess the effectiveness of a single 45-minute POCUS teaching session on JVP assessment for internal medicine residents in improving comfort level, frequency of use, and integration into clinical management.

Methods

45-minute POCUS teaching sessions on JVP assessments were carried out during internal medicine residents' noon conference. This process was repeated twice to two groups of non-overlapping residents. Each session includes 10 minutes of PowerPoint presentation on instructions and clinical implications, followed by 30 minutes of allotted time for hands-on practice with 3 V-scan ultrasounds. Pre-intervention survey was taken prior to start of the session. Post-intervention survey was distributed 2 weeks after intervention. Main outcomes measured are comfort level, frequency of use, and impact on clinical management. All variables are measured on a 0-100 sliding scale. Data were compiled and analyzed through independent t-test.

Results

Single-session POCUS training on JVP assessment is an achievable integration into internal medicine residency curriculum. It significantly increases residents' comfort level in utilizing POCUS for JVP assessment and shows trend of improvement in frequency of use and incorporation into clinical management.

Comfort level of residents in using POCUS to assess JVP increased significantly from pre-intervention (38.7, CI = 21.7-55.7) (N=10) to post-intervention (80.4, CI = 66.8-94.0) (p=0.003) (N=5). Comfort level of measuring JVP with bedside POCUS is measured through a slider scale with 0 = not comfortable at all, 50 = somewhat comfortable, and 100 = very comfortable. Frequency of using POCUS to assess JVP has increased from pre-intervention (18.4, CI = 1.5-35.3) (N=10) to post-intervention (38.6, CI = -5.3-82.5) (N=5) though not significantly (p=0.21). Frequency of measuring JVP with bedside POCUS is measured through a slider scale with 0 = never, 50 = once a week, and 100 = daily. Incorporation of POCUS JVP assessment in clinical management has increased from pre-intervention (19.5, CI = 2.9-36.1) (N=10) to post-intervention (39.8, CI = -3.7-56.4) (N=5) though not significantly (p=0.20). Frequency of JVP measurement via POCUS impacting clinical management is measured a slider scale with 0 = never, 50 = once a week, and 100 = daily.

Discussion

JVP assessment through POCUS is a fast and easy-to-learn skill that has been shown to have high sensitivity and specificity for fluid status and right ventricular function^{5,6}. It has been correlated with right heart catheterization data to show high predictability and reliability in measuring central venous congestion⁷. Despite the utility and ease-of-use, JVP assessment through POCUS has not yet been routinely adapted into our internal medicine residency training nor bed-side use. Prior needs assessments of internal medicine residents have identified significant skill gaps in ultrasound skills, and the lack of time and trainers as the main barriers to learning^{8,9}. Here we have demonstrated that a short, single-session POCUS training on JVP assessment can be easily undertaken and incorporated into the internal medicine residency education. Moreover, we see a significant improvement in comfort level of use after one session. However, the frequency of use and its application into clinical management, though shown general uptrend, remain not significantly increased. Barriers to produce meaningful changes in those realms possibly include availability of equipment, limitation in time, and heterogeneity of adoption of POCUS amongst faculty. Further quality improvement work is needed to identify ways to overcome those barriers.