We hypothesized that EZ-IO® System-naïve medics would have a statistically significant success rate advantage utilizing the proximal tibia approach versus proximal humerus approach” Gendron et al (2018).

Abstract:

BACKGROUND: Obtaining intraosseous (IO) access remains an invaluable skill in the management and resuscitation of patients on the battlefield. The U.S. Army Combat Medic is currently trained to utilize a sternal IO device (FAST1® Intraosseous Infusion System); however, the Arrow® EZ-IO® Intraosseous Vascular Access System offers unique benefits including ease of use, reload ability, and placement location versatility. Studies have demonstrated high success rates in the operational settings using the EZ-IO® System; however, no prospective studies have been conducted to assess the performance of U.S. Army’s conventional Combat Medics using the EZ-IO® System. We hypothesized that EZ-IO® System-naïve medics would have a statistically significant success rate advantage utilizing the proximal tibia approach versus proximal humerus approach.

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METHODS: A total of 77 U.S. Army Medics (Military Occupational Specialty 68 W) volunteer
participants were recruited to participate in this randomized, crossover study. Participants received a standardized audio-visual-enhanced lecture on EZ-IO® System use without hands-on training and then randomized into two study groups according to which anatomical approach they would attempt first. Results were analyzed to determine participants’ first-attempt mean success rates, mean required time to properly place the needle into simulated humeral head and proximal tibial bone models, and mean survey results measuring the participant’s subjective assessment of the two approaches to include, along with training and testing experience. The data of those not naïve to the employment of the EZ-IO® System were excluded.

RESULTS: The primary outcome measurement of overall mean participant success rate with attempted insertions into proximal tibial and humeral head bone models was 88% and 86%, respectively, demonstrating no statistically significant difference by approach, with no significant learning or design confounding effects (p > 0.05). Secondary outcomes of mean procedural time and subjective comfort and skill benefit were reported. Successful procedure times between the two anatomical approaches demonstrated a statistically significant mean time advantage of 17.1 s (p < 0.05) in proximal tibia IO placement. Overall participant mean subjective comfort level utilizing the EZ-IO® System (0- to 10-point scale with a 0 being not comfortable and a 10 being very comfortable) was 8.2, with no statistically significant difference in comfort discovered when comparing the two approaches. Participants reported a mean subjective score (0-10 scale with a 0 providing no benefit and a 10 providing extreme benefit) of 9.3 when asked how beneficial their newly learned IO system skill was to their overall medical skillset.

CONCLUSIONS: The overall first-attempt success rates of U.S. Army Combat Medics employing the EZ-IO® System are similar to the success rates of FAST1® device employment and similar to the success of other provider cohorts using the EZ-IO® device. Coupled with perceived benefit of adding the EZ-IO® System to their combat medic skillset, these data warrant further study and consideration for the incorporation of commercial IO systems into U.S. Army Combat Medic initial, sustainment, and pre-combat training and standard issue equipment.

Reference:


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