

We compared the performance of the manual and mechanical bone marrow puncture needle for adult, child and infant simulation” Ohchi et al (2015).

Reference:

Ohchi, F., Komasaawa, N., Mihara, R. and Minami, T. (2015) Comparison of mechanical and manual bone marrow puncture needle for intraosseous access; a randomized simulation trial. SpringerPlus. May 2nd. eCollection 2015.

Abstract:

BACKGROUND: During resuscitation, when it is difficult or impossible to establish peripheral venous access, intraosseous route (IO) is considered as an alternative to a central venous line. However, it is sometimes difficult for obtain IO access with conventional manual bone puncture needle. Recently, powered mechanical bone marrow needle was developed. We compared the performance of the manual and mechanical bone marrow puncture needle for adult, child and infant simulation.

METHODS: 22 anesthesiologists, who has never used bone marrow puncture needle, performed manual (Dickman™, Cook Medical) or mechanical (EZ-IO™, Teleflex) bone marrow puncture to simulated adult, child and infant tibia. Puncture success rate, insertion time, and subjective difficulty utilizing visual analogue scale was assessed.

RESULTS: In adult settings, with the manual bone marrow needle, only 3 of 22 participants could succeed in the IO route keep, while all participants did in the mechanical bone marrow puncture needle ($P < 0.001$). In child and infant settings, all trials were successful in both manual and mechanical bone marrow puncture needles ($P = 1.00$). In adult simulations, IO insertion took significantly longer with manual bone marrow puncture (54.8 ± 15.8 s) than without compressions (3.7 ± 2.1 s; $P < 0.001$). In child and infant simulations, the IO insertion time was significantly smaller in mechanical trials than in manual ones (child simulation; manual 9.3 ± 4.6 s, mechanical 2.2 ± 0.8 s, $P < 0.001$, infant simulation; manual 2.0 ± 1.1 s, mechanical 1.5 ± 0.8 s, $P = 0.003$). Although the VAS score was not significantly higher with manual trials than in mechanical trials among the three simulations (adult simulation, $P < 0.001$, child simulation, $P < 0.001$, infant simulation $P = 0.006$).

CONCLUSIONS: We conclude that in simulations managed by anesthesiologists who had no clinical experiences with bone marrow puncture, the mechanical bone puncture needle performed better than the manual one for emergency IO route access.



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needle for intraosseous access | 2

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