Intravenous versus intraosseous administration of drugs during cardiac arrest

Reference:

AIM: To perform a systematic review of the literature on intravenous (IV) vs. intraosseous (IO) administration of drugs during cardiac arrest in order to inform an update of international guidelines.

METHODS: The review was performed according to PRISMA guidelines and registered on PROSPERO. Medline, Embase and Evidence-Based Medicine Reviews were searched on December 17, 2019 for studies comparing IV to IO administration of drugs. The population included neonatal, paediatric, and adult patients with cardiac arrest. Two investigators reviewed each search for study relevance, extracted data, and assessed the risk of bias of individual studies. Meta-analyses were performed for studies without a critical risk of bias. Certainty of evidence was evaluated using GRADE.

RESULTS: We included six observational studies comparing IV to IO administration of drugs and two randomized trials assessing the effect of specific drugs in subgroups related to IV vs. IO administration. All studies included adult out-of-hospital cardiac arrest patients. No studies were identified in neonatal or paediatric patients. The risk of bias for the observational studies was overall assessed as critical or serious, with confounding and selection bias being the primary sources of bias. The meta-analyses excluding studies with a critical risk of bias favoured IV access for all outcomes. Using GRADE, the certainty of evidence was judged at very low. Subgroup analyses of the two randomized trials demonstrated no statistically significant interactions between the route of access and study drugs on outcomes. However, these trials were underpowered to assess such interactions.

CONCLUSIONS: We identified a limited number of studies comparing IV vs. IO administration of drugs during cardiac arrest. Pooled results from four observational studies favoured IV access with very low certainty of evidence. From the subgroup analyses of two randomized clinical trials, there was no statistically significant interaction between the route of access and study drug on outcomes.

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