



## Letter to the Editor

### Comments on published Resuscitation article



We are just writing a response to the article published by Feinstein et al [1]. We find it very difficult to agree with the conclusions they have found in this study which looks at survival from out of hospital cardiac arrest (OHCA). The study looks at intravenous (IV) vs Intraosseous (IO) administration of drugs and the likelihood of a return of spontaneous circulation (ROSC) and also survival outcome. We have a number of observations about the methods and statistics that we would like to share.

This was a retrospective study - so there was no randomisation of the patients to the IV or IO group. It appears that there is a large element of convenience sampling. Of the 1800 patients who were included in the study, there were only 275 in the IO group. We would argue that this study has not been powered to look for any statistical difference between the two groups.

There is no mention of a specific protocol about which patients received IO access, but there is reference to the fact that IO access is obtained when initial peripheral IV access attempts are unsuccessful. This can justify why the mean call to vascular access time was longer in the IO group as compared with the IV group. In the results, the authors share some of the patient characteristics of the IO group. They were on average younger, more often women, had a non-cardiac aetiology, an unwitnessed OHCA, initially presented with a non-shockable cardiac rhythm and more often in a private residence. These are some of the known risk factors that decrease survival from OHCA [2]. There was a proportion of patients in the IO group in an "assisted living" facility (16.7%). This may account for a poorer prognosis in these patients.

In comparison, in the IV group, a much higher proportion had a witnessed arrest of cardiac origin with a presenting rhythm of VF/VT.

The authors used the Student *t*-test for their statistical analysis. This may not be the most accurate for this dataset as it assumes that the data has no variance and normal distribution. Type 1 error (i.e.) false positive may occur if the smaller group has the highest variance. The description of the statistical methods is very limited.

It is difficult to see how they achieved a multivariable analysis when the numbers in the IO group were so small.

In conclusion, it seems a very sweeping statement from the data presented in this study to suggest that treatment via a tibial IO access was associated with a lower likelihood of a ROSC in out of hospital cardiac arrest patients.

### Conflicts of interest

Professor Anil Hormis has undertaken educational cadaveric teaching on behalf of Teleflex since 2015.

### References

- [1] Feinstein BA, et al. Intraosseous compared to intravenous drug resuscitation in out-of-hospital cardiac arrest. *Resuscitation* 2017;117:91–6.
- [2] Martinell L, et al. Early predictors of poor outcome after out-of-hospital cardiac arrest. *Crit Care* 2017;21:96.

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