

Point Of Care (POC) Technology in an Out of Hospital Emergency Setting: Limitation of a promising Technology

Giulio Trillò, Rosa La Verda*, Daniele Massarutti, Elio Carchietti

FVG Helicopter Emergency Medical Service, Udine Hospital, 33100 Udine (Italy)

*Intensive Care 2nd, Udine Hospital, 33100 Udine (Italy)

Introduction

The Friuli-Venezia Giulia Helicopter Emergency Medical Service (FVG-HEMS), based in the Udine Hospital, is the only Region Helicopter based EMS facility, and guarantees the immediate dispatch of an Anaesthesiologists based trauma team for a population of 1.2 million people. Some Authors (1, 2) postulated the use of a Point Of Care (POC) whole blood analyzing device for immediate on scene results in the pre-hospital emergency setting. We've decided to test the feasibility of such a device in our HEMS service.

Methods

During the test phase period (August 1 to September 30, 2002) we've intended to enrol all severe trauma patients ($RTS \leq 11$) rescued from one of the FVG-HEMS rescue teams, namely from the main Author of this abstract.

The POC device that was chosen for this study was the i-STAT PCA (i-Stat Corporation, East Windsor, NJ, USA). The device dimensions are 20 x 6.5 x 5 cm and weights 539 g. It is powered with two 9 volt off-the-shelf batteries. The factory specification states that the device is operating between 18 and 30 °C.

The determination cartridges were the EC4⁺ (Na⁺, K⁺, Glucose, Haematocrit) and the CG4⁺ (pH, PaCO₂, PaO₂ Lactate). Both needed 60 µL to perform an analysis. They must be long-time stored at 4 °C, but may be kept at room temperature immediately before utilization (2).

The patients were blood sampled with a Heparin treated syringe on the scene, immediately after intubation, and the blood analyzed in the cited disposable cartridges as soon as feasible according to the rescue actions priorities.

Results

In the study period 55 patients were rescued by the Author, of those 22 patients presented an $RTS \leq 11$ on scene and may therefore have been enrolled according to the study criteria.

However in 14 cases (63,6%) the iStat device wasn't operating due to high temperature limitation. Therefore, only 8 patients were analyzed, mainly during the month of September. Some of the cited Authors (2) reported to have stored the POC device in a thermal bag. We've tried the same, but inside the Helicopter the temperature reached highs of 52 °C, leading sometime to a differential of more of 25 °C. The time frame between mission start and intubation of the patient was of 22,2 (± 4.2) min. This was enough to raise quite often the thermal bag (and POC device) temperature to over 30 °C.

Conclusions

Although the South of Europe climate is commonly considered quite hot, and we've conducted our trial phase during summer months, we did not expect so much temperature related problems. After this trial, we've reconsidered the acquisition of the device, and contacted the producer hoping for a technical solution to our problems, but none was proposed, and we were obliged to abandon this promising technology.

References

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2. Herr D, Newton NC, Santrach PJ, Hankins DG, Burrit MF. Airborne and rescue point of care testing. *Am J Clin Pathol* 1995; 104 (Suppl 1).S54-S58.