

## LETTER

# Is automated peritoneal lavage a better way than an endovascular device to induce mild therapeutic hypothermia after resuscitated cardiac arrest?

Pierre Esnault\*, Guillaume Lacroix, Jean Cotte, Pierre-Julien Cungi, Erwan D'Aranda and Bertrand Prunet

See related research by de Waard *et al.*, <http://ccforum.com/content/17/1/R31>

We read with great interest the study by de Waard and colleagues highlighting interest in continuous peritoneal lavage (PL) to induce mild therapeutic hypothermia (MTH) in unconscious patients after resuscitated cardiac arrest [1]. It is now quite well established that MTH improves outcome [2]. Compared with cooled intravenous infusion and cooled blankets, the authors showed that the target temperature was reached faster (30 minutes vs. 150 minutes) and had a lower coefficient of variation during the maintenance phase (0.5% vs. 1.5%) in the PL group [1].

However, using this PL method in daily practice seems difficult to us and this device must be used by experienced operators (usually surgeons) to limit the complications. In our unit, we have used an intravascular device consisting of a central venous catheter (Icy™ catheter;

ALSIUS Corporation, Irvine, CA, USA) associated with an external heat exchange system (CoolGard 3000™; ALSIUS Corporation). This device acts as a thermostat for core body temperature control. This system replaces the triple-lumen central venous catheter, whose efficacy is proven [3,4]. The CoolGard 3000™ allows fast cooling, stability of the temperature and controlled progressive reheating. Few complications have been reported and have been essentially related to the central venous access (placement errors, catheter-related thrombosis, infection) [5]. The system's main limitation is its accessibility and its cost.

To conclude, although PL is interesting to obtain MTH in post-resuscitation patients, we believe that the use of an endovascular device seems to have a better benefit/risk ratio.

---

### Author's response

Monique C de Waard and Albertus Beishuizen

We thank Esnault and colleagues for their response to our study [1] and would like to address the issues they raised. They stated the potential difficulty of using PL in daily practice to induce MTH. Their main concern is the need for experimented operators to insert the PL catheter and thereby limit complications. Indeed, PL is not (yet) used as part of standard care such as venous catheter insertion, as is used for intravascular cooling. However, the Velomedix PL system (Velomedix Inc., San Francisco, California, USA) is a modification of existing technologies and standard techniques that are used on a daily basis in peritoneal dialysis and laparoscopic surgery. We

wish to emphasize that catheter insertion was performed by experienced and well-trained intensivists without any need for surgeons. The insertion technique is easy to learn, as we used cadaver training and experienced instructors. One intensivist and one nurse operating the controller system are needed, leading to catheter insertion times <2 minutes. Complications related to insertion of the PL catheter were not seen in our patients.

The results demonstrate an extremely rapid (<30 minutes after induction), safe and feasible way of applying MTH in a controlled ICU setting. Currently, a randomized pilot trial is initiated to evaluate the PL system in patients with ST-segment elevation myocardial infarction (ClinicalTrials.gov:NCT01655433). We believe that, with respect to the benefit/risk ratio, the use of an endovascular device [5] is not superior to the use of the PL system. However, randomized trials are warranted to confirm this hypothesis.

---

\*Correspondence: [pierre.esnault@gmail.com](mailto:pierre.esnault@gmail.com)  
Teaching Military Sainte Anne Hospital, Department of Intensive Care and Anesthesiology, BP20545, 83041 Toulon Cedex 9, France

#### Abbreviations

MTH, mild therapeutic hypothermia; PL, peritoneal lavage.

#### Competing interests

The authors declare that they have no competing interests.

Published: 3 May 2013

#### References

1. de Waard MC, Biermann H, Brinckman SL, Appelman YE, Driessen RH, Polderman KH, Girbes AR, Beishuizen A: **Automated peritoneal lavage: an extremely rapid and safe way to induce hypothermia in post-resuscitation patients.** *Crit Care* 2013, **17**:R31.
2. Bernard SA, Gray TW, Buist MD, Jones BM, Silvester W, Gutteridge G, Smith K: **Treatment of comatose survivors of out-of-hospital cardiac arrest with induced hypothermia.** *N Engl J Med* 2002, **346**:557-563.
3. Wolff B, Machill K, Schumacher D, Schulzki I, Werner D: **Early achievement of mild therapeutic hypothermia and the neurologic outcome after cardiac arrest.** *Int J Cardiol* 2009, **133**:223-228.

4. Prunet B, Asencio Y, Lacroix G, Bordes J, Montcriol A, D'Aranda E, Pradier JP, Dantzer E, Meaudre E, Goutorbe P, Kaiser E: **Maintenance of normothermia during burn surgery with an intravascular temperature control system: a non-randomised controlled trial.** *Injury* 2012, **43**:648-652.
5. Al-Senani FM, Graffagnino C, Grotta JC, Saiki R, Wood D, Chung W, Palmer G, Collins KA: **A prospective, multicenter pilot study to evaluate the feasibility and safety of using the CoolGard System and Icy catheter following cardiac arrest.** *Resuscitation* 2004, **62**:143-150.

doi:10.1186/cc12603

**Cite this article as:** Esnault P, *et al.*: Is automated peritoneal lavage a better way than an endovascular device to induce mild therapeutic hypothermia after resuscitated cardiac arrest? *Critical Care* 2013, **17**:431.