Perioperative cooling to prevent adhesion formation may be counterproductive for the clinical outcome

Sir,

In their experimental study on mice, Binda and Koninckx found that lowering the body temperature decreased adhesion formation after laparoscopic surgery (Binda and Koninckx, 2009). Accordingly, they identified perioperative cooling as a possible method to be used in combination with other measures to prevent the formation of adhesions. Although this idea seems experimentally interesting, we would like to argue against the clinical use of cooling, since it may be counterproductive for patients’ outcome after surgery.

An earlier randomized clinical trial has clearly shown that a decreased perioperative core temperature of only 1.9°C increases the incidence of surgical wound infection 3-fold (Kurz et al., 1996). This is explained by the fact that cooling decreases tissue perfusion and oxygenation (Sheffield et al., 1996; Hopf et al., 1997). Thus, the suggested lowering of body temperature from 37°C to 32°C, which Binda and Koninckx refer to as a ‘slight cooling’, will in fact constitute a major counterproductive intervention. At the end of their article, Binda and Koninckx speculated that possible side effects of general hypothermia could perhaps be circumvented by restricting local cooling of the abdominal cavity to superficial mesothelium. However, during anesthesia, heat is more easily redistributed between superficial layers and the body core, whereby the latter would be affected as well (Sessler, 2001). Furthermore, since the superficial tissue forms the site where contaminating bacteria may appear and establish a wound infection, even local superficial normothermia has to be maintained for immunity (Hopf et al., 1997). Besides, if the local cooling was to be achieved by insufflation of cold humidified gas, the relative humidity of the gas would fall below 100% as it is heated up. Consequently, desiccation would occur, which Binda and Koninckx have already found to be ‘clearly adhesiogenic’. In contrast, keeping the surgical wound warm by insufflation of heated humidified carbon dioxide should be more appropriate as it would help to prevent a number of post-operative complications including shivering, prolonged intubation and hospitalization, cardiovascular morbidity, surgical site infection and even adhesion formation (Kurz et al., 1996; Sheffield et al., 1996; Hopf et al., 1997; Sessler, 2001; Persson and van der Linden, 2008; Peng et al., 2009).

In the light of the above and the fact that Binda and Koninckx have identified many other effective approaches, we cannot find any valid reason for a clinical use of intraoperative cooling for prevention of post-operative adhesions.

Funding

Financial support was provided by the Karolinska Institute, Cardia Innovation AB and through regional agreement on medical training and clinical research (ALF) between Stockholm county council and the Karolinska Institute, Stockholm, Sweden. The authors have patented a CO2 insufflation device, which is referred to in one of the references, and are shareholders of the company, Cardia Innovation AB, which produces the device and owns the patents.

References


