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Microcirculatory effects of goal directed fluid therapy in colorectal surgery: A mechanistic cohort study

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Goal directed fluid therapy (GDFT) optimizes oxygen delivery by guiding fluid administration using cardiac output analysis. It has demonstrated to enhance the bowel function and to decrease the incidence of postoperative primary ileus (PPOI) in some clinical trials. Bowel perfusion is critical for bowel motility; thus, an improvement of the splanchnic blood flow might explain the effects of GDFT on bowel function. Nowadays, it is feasible to evaluate tissue microcirculation at the patient's bedside with side stream dark field (SDF) technology. A cohort of 24 patients undergoing colorectal surgery in an enhanced recovery program at the Montreal General Hospital and receiving either intraoperative GDFT (eight patients) or standard fluid therapy (16 patients) was followed and microcirculatory measurements were done using the MicroScan, MicroVision Medical at seven different perioperative time points. Bowel function and incidence of PPOI were assessed. PPOI was found in three patients in GDFT and three patients in the standard fluid therapy exposure ($p=0.643$). The overall perioperative proportion of perfused vessels (PPV) was higher in the GDFT exposure ($p=0.023$); and specifically on postoperative (POP) day three ($p=0.032$). There was no significant difference in other microcirculation outcomes. To conclude, GDFT improves the PPV, a key factor for oxygen extraction in the tissues, effect that was sustained until postoperative day three. GDFT also demonstrated a more stable oxygen delivery throughout the surgery. Nevertheless, these physiological effects did not translate into a better postoperative bowel function in GDFT compared to standard fluid therapy.

Biography

Juan C Gomez-Izquierdo is currently pursuing PhD in Experimental Surgery at McGill University. He has completed a Research Fellowship in Department of Anesthesia at the same university and obtaining Medical Residency training at Jewish General Hospital in Montreal. He has completed his Medical degree at Pontificia Universidad Javeriana. He has co-authored different papers in perioperative care and goal directed fluid therapy, including meta-analyses, randomized controlled trials, cohort studies and three book chapters. His area of interest includes epidemiology, evidence-based medicine and hospital care.

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