

Switching from Goal-Directed Fluid Therapy to Goal “Monitor-Oriented” Fluid Therapy.

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Abstract:

Subjects undergoing major surgery are constantly exposed to a high risk of postoperative complications. Patient related factors depend on disease, age and comorbidities, whereas procedure related factors depend on the interference of surgery and anesthesia with the functional status of the patient. The duration of the procedure under general anesthesia can be associated with the probability of developing anesthesia related complications, [1].

Keywords: goal-directed fluid therapy; monitor-oriented; anesthesia

For such a reason, longer surgeries require more attention in maintaining cardiovascular homeostasis, and often steering by sight with fluid therapy is not sufficient to detect potential discrepancies between a desirable homeostatic set-point and where the system actually is (i.e. hypervolemia vs. hypovolemia). This holds true whether it is fluid therapy, mechanical ventilation or sedation. Regardless of the system involved, the main target of the anesthesiologist is to reduce the impact of anesthesia and to minimize the risk of complications in modern anesthesiology, our community has increased the level of awareness on fluid administration. The ultimate goal is to guarantee adequate cellular respiration [2, 3].

Lately, the growing concern that fluids are not just vehicles for drug dilution but proper drugs has brought further attention to their dosing in the perioperative period.

The everlasting dispute is about choosing restrictive or a liberal regimen, [2]. Recently, it has been demonstrated that the two strategies compared in the setting of major abdominal surgery do not affect mortality [3].

Despite many other studies have addressed this question, we would like to point out the inability of large clinical trials to unravel such mechanisms that bring to altered outcomes when multiple physiological variables need to be considered instead.

Monitoring cardiac output during major abdominal surgery may ameliorate the risk of post-operative morbidity, [4]. However it is not just one variable (i.e. cardiac output) that we ought to consider. Most often, the anesthesiologist does not adequately monitor the hemodynamic status of the patient, as demonstrated with the FENICE study[5]. In this study, Authors found that most anesthetist's anesthesiologists monitor hemodynamics and consequently adjust fluid therapy according to by

static parameters (i.e. central venous pressure) or without any other parameter than non-invasive blood pressure. We must keep in mind that fluid overload leads to an extravascular leak of fluid causing edema and consequent impairment of oxygen delivery to tissues that may already be on the brink of ischemia. On the other hand, under-administration of fluids may cause hypovolemia and tissue hypo perfusion, also responsible for impaired oxygen delivery to tissues that are already hypo perfused because of the general anesthesia.

From here, we may consider that a "zero-balance" approach, as suggested by Licker, of fluid may not be the best choice for fluid therapy management[6, 7], There find numerous pitfalls when we compute the balance of fluids. We have to take into account the amount of fluid loss due to different pathways, and most of them are not measured, but estimated. Estimation should only be left when no other system of measurement is available, as clinical examination performs insufficiently to estimate hemodynamics, [8].

Furthermore, during a major surgery bleeding may represent an important part of fluid loss which cannot be replaced by cristalloids: Given the above, the calculation of a fluid balance may be very difficult and consequently not reliable guidance.

In our experience, who received invasive hemodynamic monitoring and were assessed for fluid responsiveness received a minor amount of fluids. On the contrary, patients not receiving a complete monitoring, received more fluids, which were possibly not necessary. Interestingly, more frequent post-operative complications occurred in patients who did not receive a monitored fluid therapy [9]. Intraoperative fluid therapy cannot be administered in a standard way to every patient. Nowadays “one-fit-all” strategies is an arbitrary and potentially harmful policy.

Consequently, the safest patient's management must include hemodynamic measurements (preferably dynamic indexes) and physicians not sufficiently confident with devices of cardio-circulatory system monitoring need to catch up.

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