Short Communication

When to Start and Stop the Inotropic Drugs in Cardiac Surgery?

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When to start and stop the inotropic drugs in cardiac surgery remains a matter of controversy, particularly concerning hemodynamic management, is a question of when to start inotropic treatment, nobody focused on the development of Surviving Sepsis Campaign guidelines [6].

Despite being so widely used, several surveys and studies highlighted a large inter- and intra-center variability in use of inotropes in adult and pediatric cardiac surgery, both in frequency of administration and in choice of first-line agents [2-4]. Furthermore, observational studies have suggested that inotropes use may increase mortality, although this finding does not seem to find confirmation in randomized clinical trials (RCTs) [5].

In such a context, implementation of evidence-based recommendations may be of great help for physicians and improve outcome, as occurred after the development of Surviving Sepsis Campaign guidelines [6].

Unfortunately, available evidence on inotropes use after cardiac surgery is weak [7]. Although a consistent number of RCTs have been performed, only few were adequately designed to investigate clinically relevant outcomes, such as mortality [7], even though the call for high-quality evidence dates back to the late ‘80s [7].

Furthermore, post-operative pathophysiology might be very different between patients depending on the pre-operative cardiac disease. For example, variation in heart rate and rhythms, preload, afterload or ventricular compliance may be very differently tolerated if the heart was chronically ischemic, pressure-overloaded or volume-overloaded, and management should vary accordingly, thus making development of guidelines and design of RCTs particularly difficult. An objective quantification of inotropic support may thus be of help both for clinicians and researchers, allowing stratification of disease severity and prognosis. The Vasoactive-Inotropic Score (VIS) currently derived and validated only for pediatric cardiac surgery [8], is a simple tool which could be more extensively applied also to adult patients.

Timing of initiation and suspension of inotropes and vasopressors is also critical, as an unnecessary administration exposes the patient to side effects without providing benefits, while waiting too long before initiating hemodynamic support may lead to end-organ damage. Therefore, accurate and comprehensive monitoring of hemodynamic parameters and perfusion indices has a pivotal role. Is thus not surprising that also in this setting goal-directed perioperative hemodynamic optimization showed promising results [9], although the efficacy of standardized protocols in intensive care unit (ICU), particularly concerning hemodynamic management, is a matter of debate [9]. It is worth noting that, while several studies addressed the question of when to start inotropic treatment, nobody focused on determining when treatment has been successful and is appropriate to interrupt vasoactive administration.

Besides pharmacologic support, perioperative hemodynamic management include also optimization of volume status and pacing, transfusion and, if necessary, institution of mechanical circulatory support (which can range from intra-aortic balloon pump [IABP] to full cardiopulmonary support with extra-corporal membrane oxygenation [ECMO]). Unfortunately, all of these issues are subject to controversies and debate (perioperative fluid administration is a clear example).

However, despite all these limitations, guidelines on post-operative intensive care management of cardiac surgery patients have been developed in Germany and have been helpful in changing clinical practice [10].

We believe that recommendations from world-renowned experts, based on available evidence, should be developed for perioperative hemodynamic management of cardiac surgery patients.

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