Early goal-directed therapy

This therapy was introduced by Emanuel P. Rivers, MD, MPH in the New England Journal of Medicine in 2001 and is a technique used in critical care medicine involving intensive monitoring and aggressive management of perioperative hemodynamics in patients with a high risk of morbidity and mortality.

In cardiac surgery, GDT has proved effective when commenced after surgery. The combination of goal-directed therapy and Point-of-Care Testing has demonstrated a marked decrease in mortality for patients undergoing congenital heart surgery.

Furthermore, a reduction in morbidity and mortality has been associated with GDT techniques when used in conjunction with an electronic medical record.

Early goal-directed therapy is a more specific form of therapy used for the treatment of severe sepsis and septic shock. This approach involves adjustments of cardiac preload, afterload, and contractility to balance oxygen delivery with an increased oxygen demand before surgery.

Elements

In the event of hypotension and/or lactate greater than 4 mmol/L, initial management includes a minimum fluid challenge of 30 ml/kg of crystalloid solution.

Crystalloid solutions are recommended over colloid solutions given the cost and lack in difference of mortality benefit.

Albumin may be considered if large amounts of crystalloid solution is needed.

Indications of a positive response to fluid resuscitation may include:

a low central venous pressure

a decrease in heart rate

In hypotension persists despite fluid resuscitation (septic shock) and/or lactate > 4 mmol/L (36 mg/dl), goals in the first 6 hours of resuscitation include:

Achieve CVP of 8-12 mmHg. Mechanical ventilation, increased abdominal pressure, and preexisting impaired ventricular compliance may require higher CVP targets of 12-15 mmHg

Achieve superior vena oxygen saturation (ScvO2) of > 70% OR mixed venous oxygen saturation (SvO2) of > 65%. If initial fluid resuscitation fails to achieve adequate oxygen saturation additional options include dobutamine infusion (maximum 20 μg/kg/min) or transfusion of packed red blood cells to a hematocrit ≥ 30%. If a ScvO2 is unavailable, lactate normalization may be used as a surrogate marker. A reduction in lactate by ≥ 10% is noninferior to achieving a ScvO2 of ≥ 70% Achieve MAP ≥ 65mmHg[5] The presence of atherosclerosis or pre-existing uncontrolled hypertension may necessitate a higher MAP target. Achieve Urine output ≥ 0.5 mL/kg/h Successful targeting the above goals in the first 6-hour period results in a 15.9% absolute reduction in 28-day mortality rate.

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