Distributional shock (pediatrics)

Pathogenesis and characteristics

Distributive shock means initially a relative lack/loss of intravascular volume by sudden peripheral vasodilatation. With excessively increased vascular permeability, **capillary leak syndromu** develops, which then leads to absolute hypovolemia due to extravascular fluid loss.

Since organ perfusion is affected by the pressure gradient and vascular resistance, failure of vasomotor tone and/or loss of control of circulating volume distribution can lead to shock syndrome, even when the cardiac index is completely normal or even elevated. The classic clinical picture is the initial stage of sepsis (high flow phase). Selective arteriolar dilation in shock states causes direct cellular damage and massive fluid transudation into the extracellular space. In the case of fluid transudation from the intravascular area into the interstitium, a hypovolemic type disorder is assigned to the distribution disorder. In this connection, let's recall the classic physiological division of microcirculation disorder into the "ebb and flow" phase. In the first phase of the circulatory disorder, we resolve the condition by supplementing the circulating volume, only in persistent hypotension do we indicate titration doses of inoconstrictors, possibly in combination with inodilators.

Etiologie

- sepsis
- anaphylaxis
- intoxication
- capillary leak syndrome
- traumatic shock
- spinal shock
- adrenal crisis

Traumatic shock

Traumatic shock is a combination of distributional shock and hypovolemic shock, most often due to simultaneous blood loss. However, traumatic shock can occur even without the presence of hypovolemia. If there is no blood loss and the clinical picture is affected only by the release of tissue mediators (if we overlook the activation of the sympathoadrenal system), it is classified as a distribution shock. Traumatic shock can also be of cardiogenic or obstructive origin (tension pneumothorax, myocardial contusion). The circulatory situation can be characterized by hypotension with an increase in CO/CI. Systemic vascular resistance is low, oxygen transport is increased, and the arteriovenous oxygen difference is smaller. Oxygen consumption is mostly the same. In the treatment of hemorrhagic shock, colloids (hydroxyethylamyla and plasma) along with erysma are preferred over crystalloids.

Septic shock

Septic shock is usually a combination of pathophysiological conditions. Septic shock is accompanied by hypovolemia, myocardial depression with the predominant influence of a distribution disorder. In the initial stages, in terms of circulatory parameters, it is described as a **hyperdynamic** state with high cardiac output and reduced systemic vascular resistance. The same hemodynamic picture is found in liver failure, hyperthyroidism and traumatic shock without significant hypovolemia. In septic shock, there is an abnormal situation in the area of **peripheral perfusion**. Initially, children are well perfused, have a widened pulse pressure, PulP (difference between sTK and dTK) and increased CI. However, the increase As a rule, CO/CI does not compensate for a significant decrease in SVRI, so systemic hypotension occurs. Over time, the function of the myocardium is also affected (reduced stroke volume and ejection fraction) and there is a decrease in CI. In the textbook case, the further development of the septic condition leads to an increase in peripheral vascular resistance and a picture of low flow. In the final phase, the function of the myocardium is affected, the picture is close to the symptomatology of cardiogenic shock and the development of MODS.

Anaphylactic shock

With extreme vasodilatation, hypotension, tachycardia and a decrease in the filling pressures of the heart chambers occur. Stroke volume is also reduced. From a clinical point of view, the finding of a patient with a warm, pink periphery with a threadlike pulse, tachycardia and systemic hypotension is important.

Therapy

The standard combination of current pharmacological regimens in the treatment of distributive shock is noradrenaline and titration therapy with replacement solutions.

Links

Source

- HAVRÁNEK, Jiří: *Šok*. (edited)

Related articles

- Shock classification (pediatrics)