Severe anaphylaxis in onset of anesthesia
The possibilities of the use of extracorporeal circulation technology.

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ABSTRACT

Two cases of severe anaphylactoid reactions during anesthesia are presented. The reason to present these cases is not only that this is really very rare and catastrophic complication during anesthesia, but we also demonstrate how the immediate and professional actions by perfusionists and surgeons saved the life of the particular patients. Timely initiation of cardiopulmonary bypass was beneficial and life saving in patients with compromised coronary circulation. In both cases emergency initiation of extracorporeal life support gave necessary time to apply the treatment of an anaphylactic reaction and provide an uneventful postoperative period. These cases are presented as just an example how extra-corporeal circulation could be beside cardiac surgery could be used for treatment of a wider spectrum of diseases and conditions. However, the use of this technology in other areas is strongly depended of how professional we are.

EXTINCTION

"Anaphylaxis is a potentially life-threatening allergic reaction characterized by a syndrome of systemic signs and symptoms, including cardiovascular collapse from distributive shock. Current data suggest that there are approximately 1500 annual deaths from anaphylaxis world wide"(1). We chose these particular examples because, first, these cases are really very rare and catastrophic complications of anesthesia. Second, in both cases the perfusionists played a key role in decision making and in treatment of these patients.

Last four-five years in the internet forum for perfusionists - 'Perflist' one could read that our profession is becoming extinct, that we have to search for new jobs, or we have to start to prepare 'platelet gel concentrate'. What is the reason for this? Is requalification to operator of a cellsaver machine really unavoidable? In some cardiac centers the perfusionist is seen as just an operator of the "pump", who blindly follows the orders of the anesthesiologist or surgeon. This situation could be explained by a tradition from the era of disk and bubble oxygenators, when everybody was happy when the patient just survived cardiopulmonary bypass. However, passiveness, fear of responsibility and, in some cases lack of knowledge, constantly feed and support the existence of this situation. It is very understandable that in such hospitals, were perfusionists are playing a passive role of anesthesiology poppet, even an average surgeon will achieve better results with OPCAB then with CPB.

PROFESSIONALS

In our opinion this situation is absolutely wrong. There is a huge discrepancy between the potentials of cardiopulmonary bypass methods and the place of the perfusionist. During the last decades scientific and technological progress in extracorporeal circulation (ECC) methods and equipment made cardiopulmonary bypass a lot safer and more effective. We are talking now about actual controlling haemodynamic, oxygen transfer, core temperature, acid-base state, electrolytes, colloid-osmotic pressure, circulating and interstitial volumes, renal function, cardiac function, correction of coagulation, controlling of inflammatory response due to surgical trauma, etc.

There is a clear tendency in changing ECC from just substitute of natural circulation during cardiac surgery into a powerful supporting method. One of the most pro-

mising applications of ECC is the extracorporeal life support for a wide spectrum of critical conditions and diseases, including anaphylactic shock.

ANAPHYLAXIS

The incidence of anaphylaxis and anaphylactoid reactions during anesthesia is very difficult to estimate but has been reported in most recent review to range from 1 in 3,500 to 1 in 20,000 cases (2). Beta-lactams are the antibiotics which most frequently provoke adverse reactions mediated by specific immunological mechanisms(3,4). The other, possible causes of anaphylaxis and anaphylactoid reactions during anesthesia are muscle relaxants. According to Laxenaire and Mertes (2001), muscle relaxants account for 69.2% of anaphylactoid reactions during an anesthesia (5).

We present two cases of severe anaphylactic reactions developed just after induction of anesthesia in patients for the elective coronary bypass surgery.

The first one, patient B., 67 years old, underwent elective coronary bypass surgery in 1998. The second case we encounter in November 2003. Patient V., 71 years old, was also scheduled for elective coronary bypass surgery. Both patients had no known previous drug allergies. In both cases severe anaphylactic reactions with circulatory shock developed after infusion of pavulon 8 mg and kefzol 2000 mg. Rapid intravenous infusion of crystalloid and colloidal solution (up to 2000 ml during first ten minutes of shock) was not effective. There was not any significant respond to repeated injections of ephedrine and noradrenalin infusion, as well. Emergency cardiopulmonary bypass was initiated in 20 - 25 minutes after onset of cardiovascular collapse in both presented cases. In both cases the antihistamine (clemastine 2 mg) and glucocorticoids (pednisolon 100 mg) were given intra-venous after the initiation of the extracorporeal circulation. However, it was necessary to keep at least 20 min of high-flow perfusion with high doses of noradrenalin before any rise of the mean arterial pressure could be achieved.
Both patients had an uneventful postoperative period, and were both discharged from hospital after 6 days of observation.

FUTURE

These two cases demonstrate that fast and professional actions of perfusionists, and surgeons, timely initiation of cardiopulmonary bypass can be beneficial and life saving even in patients with compromised coronary circulation. In both our cases emergency initiation of extracorporeal life support gave necessary time to apply the treatment of an anaphylactic reaction and provided an uncomplicated postoperative period. These cases are just one example how the extra-corporeal circulation could beside cardiac surgery used for treatment of a wider spectrum of diseases and conditions. The future of perfusiology is in expanding of extracorporeal methods from the cardiac operating room to the intensive care, and first aid departments. We accumulate a lot of unique and specific knowledge. We are working with one of the most powerful tools which medicine ever had. However, the future of our profession depends of how professional we are.

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