SUCCESSFUL OPEN-CHEST CARDIOPULMONARY RESUSCITATION AFTER ANAPHYLACTIC SHOCK

Mariana Cunha¹, Caroline Dahlem², Diana Paupério²

1. Centro Hospitalar Tâmega e Sousa, Portugal; 2. Centro Hospitalar Vila Nova de Gaia/Espinho, Portugal

BACKGROUND

Anaphylaxis is the most dramatic clinical presentation of allergy.¹ Whereas skin and respiratory tract are most frequently involved, dysfunction of the cardiovascular system usually dictates the outcome.¹ The number and density of cardiac mast cells is larger in patients with heart disease¹, thus posing an extra risk for serious anaphylactic shock in the event of allergen exposure.

CASE REPORT

A 64-year-old male, with dyslipidaemia, hyperuricemia, aortic valve regurgitation, left ventricular ejection fraction of 50%, presented for aortic valve replacement. Figure 1 summarizes the sequence of events that followed after arriving to the operating room:

Figure 1 - Sequence of events and procedures

The patient then received an adrenaline infusion. Patient was monitored with cerebral oximetry (INVOS®) and bispectral index (BIS®) in an attempt to evaluate cerebral activity. An arterial and central venous line were catheterized. Surgery was performed with extracorporeal circulation and temperature was lowered to 32°C. Acid base and electrolyte disorders were corrected. During the procedure, cerebral oximetry was kept symmetrical and over 50, BIS values increased and burst suppression rate diminished. Anaesthesia was maintained with desflurane, remifentanyl and propofol during extracorporeal circulation. Transoesophageal echocardiography evaluation by the end of surgery revealed left ventricular ejection fraction of 40% and global hypokinesia. After the surgery, the patient was transferred to Intensive Care Unit. Mast cell tryptase was measured 2 hours and 24 hours after the event. Values lowered from over 200ng/mL in the first analysis to normal (8.5ng/mL) in the second. On the first postoperative day he was extubated and had no apparent neurologic deficit. At 3-month follow-up evaluation the patient had total amnesia for the event and minor neurologic complaints (bilateral hand paraesthesia and a slight memory impairment).

DISCUSSION

Open-chest CPR has been shown to be hemodynamically superior to closed-chest CPR.³ However, up till now it is only recommended in post-cardiac surgery patients.² Doubts remain about safety, ethical validity and possible outcome. The timing of switching to open-chest CPR is not determined and may be a key point in survival. In our case, we were performing closed-chest CPR for 40 minutes. To the best of our knowledge, there is no published case of successful open-chest CPR after an anaphylactic shock. Maybe open-chest CPR should be integrated in resuscitation protocols as a rescue measure after some unsuccessful attempts to improve survival. Internal paddles increase efficacy of defibrillation. We believe that refractory VF may be a reason to switch to open-chest CPR.

In this case, performing the surgery with extracorporeal circulation was also a key point to guarantee a better outcome. Aortic valve replacement improved cardiac function and facilitated recovery after cardiac arrest. Extracorporeal circulation provided hypothermia, good oxygenation and a quick recovery of acidosis and hypercapnia. Cardiac arrest caused by anaphylactic shock is a rare event but it might be more frequent in patients with history of heart disease. Open-chest CPR could be a rescue treatment after a few minutes of unsuccessful closed-chest CPR.

LEARNING POINTS: To the best of our knowledge, this is the first report of successful open-chest CPR after an anaphylactic shock. Open-chest CPR should be considered as a rescue treatment for cardiac arrest in refractory VF.

REFERENCES

1-ClinExpImmunol.2008;153Suppl1:7-11; 2-Resuscitation.2015;95:100-47; 3-Resuscitation.2005;64(2):149-56.