

## Near-infrared spectroscopy reveals transient endothelial dysfunction during acute anaphylaxis: a case report

Anssens S, Moerman A, Wouters P, De Hert S

Institute: Ghent University Hospital, Dept of Anaesthesiology, Gent , Belgium

**Background.** During severe acute anaphylactic shock, circulating blood volume may decrease by as much as 50%. It has been suggested that this increased vascular permeability might be attributed to a transient endothelial dysfunction,<sup>1</sup> but firm evidence for this hypothesis is lacking.

Endothelial function can be assessed by measurement of the postocclusive reactive hyperemia (PORH) response.<sup>2</sup> PORH refers to the reproducible transient increase in blood flow after release of an arterial occlusion. The velocity and degree of flow restoration depend on the capacity of the microvasculature to recruit arterioles and capillaries, thereby reflecting the integrity of the microcirculation.<sup>2</sup>

We report the PORH response assessed by near-infrared spectroscopy in a case of acute anaphylaxis. The responses during this event were suggestive for the presence of transient endothelial dysfunction.

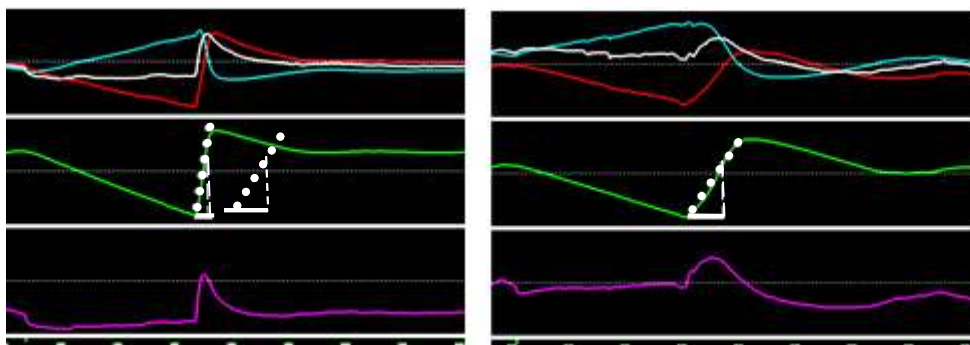
**Case report.** A 53-year-old male patient was scheduled for coronary artery bypass grafting surgery. After induction of anesthesia, a thoracic flush with a dramatic fall in arterial blood pressure and tachycardia were observed. An arterial blood sample showed a pronounced increase in hemoglobin from 14.6 g/dl before induction to 21.7 g/dl after the event. A prominent capillary leak induced by the anaphylactic reaction was suspected.

During the surgical procedure, the extent of capillary leak evolution was monitored by sequential PORH measurements. The figure demonstrates a significant impairment of microvascular reactivity after the event, indicated by a longer recovery time (time from release of cuff to initial value) (solid line) (from 12 to 64 sec), and lower rate of recovery (dotted line) (from 118%/sec to 30%/sec). At the end of the operation, PORH measures were partly restored.

**Discussion.** Our results indicate that increased vascular permeability during acute anaphylaxis might be attributable to transient endothelial dysfunction.

**References.** 1. J allergy Clin Immunol 2005;115:S483-523; 2. Gerovasili V et al. Int J Ind Ergonom 2010;40:218-22

**Learning points.** Sequential PORH measurements offer the opportunity to monitor the extent and progress of capillary leak during acute anaphylaxis.



PORH before and after anaphylaxis