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Lung ultrasound for detection of increased extravascular lung water, cardiac and non-cardiac patients who underwent non-cardiac surgical procedures

Maja Karaman Ilic

Specijalna bolnica Radiochirurgia Zagreb, Croatia

Abstract

Aim: Prevention of post-operative cardio-respiratory deterioration in cardiac and non-cardiac patients who have undergone non-cardiac surgical procedure due to perioperative fluid overload.

Introduction: Induction in general anaesthesia (GA) drives patients in hypotension. Vasodilation, particularly veno-dilatation, is the primary cause of relative hypovolemia produced by anaesthetic drugs. Relative hypovolemia is a consequence of increased venous compliance, decreased venous return and reduced response to vasoactive substances. Maintenance of adequate cardiac output (CO) and arterial blood pressure are vital for preserving tissue perfusion and oxygen delivery (DO2). To preserve CO and adequate organ perfusion, anaesthesiologists may choose between liberal perioperative fluid approach and a restrictive one with small dose of vasoactive drugs. Each choice carries its own risks. In general, a liberal perioperative volume replacement strategy is more common choice. As a consequence of selected therapy, fluid overload is often seen. The clinically most significant complication of excessive volume is “Lung -Swelling” respectively pulmonary oedema. Standard monitoring that includes clinical exam, chest X ray, oxygen saturation of peripheral blood (SpO2) and blood lactate level lacks sensitivity and specificity for pulmonary oedema diagnose. Additionally, those are late indicators of tissue and organ hypo- perfusion. Lung ultrasound provides high diagnostic sensitivities and specificities in detecting various lung pathologies: Interstitial syndrome, pneumothorax and alveolar consolidation. Interstitial syndrome represents a variety of clinical situations, including pulmonary oedema, respiratory distress syndrome, pneumonia and interstitial diseases. Due to the development of pulmonary oedema, transition of A-profile (normal lung ultrasound finding) to B-profile (that is specific for interstitial syndrome) occurs. These findings enable us to act therapeutically even before the late indicators of cardio-respiratory deterioration appear.

Conclusion: Lung ultrasonography is a helpful, non-invasive method for early detection and treatment of perioperative fluid overload.

Biography

Maja Karaman Ilic, M.D, PhD is an Assistant Professor. In 2011, he received his Ph.D. from the Zagreb University School of Medicine. In 2018, he was elected as Assistant Professor at Faculty of Medicine, JJ Strossmayer University of Osijek, Croatia. Since 2019 he has been working at Radiochirurgia Sveta Nedjelja, Croatia as an expert in anaesthesiology, resuscitation and intensive care. Some of his papers were published in reputed journals. Since 2017, he is an invited speaker on Cardiologists Conference in Paris 2017, Barcelona in 2018, and Rome in June 2019.

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