Extracorporeal membrane oxygenation and swine flu

Viroj Wiwanitkit

Received: 22 November 2010 / Accepted: 8 April 2011 / Published online: 3 May 2011
© The Japanese Society for Artificial Organs 2011

Editor, I read the recent publication on the management of swine flu carditis with vein–artery plus vein–vein extracorporeal membrane oxygenation (ECMO) with great interest [1]. Oda et al. [1] reported that a mechanical support device was an effective tool for the management of myocarditis due to swine flu and spinal infarction that appeared as a complication in this case. Indeed, the cardiac manifestation of swine flu is uncommon and very interesting [2]. The utility of ECMO has been confirmed. Recently, Duan et al. [3] reported that “vein–vein mode ECMO bypass through femoral vein–internal jugular vein can offer effective aid to pulmonary function in influenza A H1N1 patients who are critically ill.” I have some thoughts on the publication by Oda et al. Spinal infarction in cases managed with vein–arterial ECMO is still an interesting issue. Grosek et al. [4] noted that cases of “severe cardiorespiratory failure treated with extracorporeal membrane oxygenation are at risk of hypoxic–ischemic injury and infarction of the brain, intracranial hemorrhage, and seizures.” For the possible mechanism, Oda et al. [1] noted that “this might be related to the hypotension during the chest compression when the electrical storm occurred.” If this is the exact mechanism, it should lead to some differences between cases that are using and cases that are not using ECMO. However, it was recently reported that the same hospital mortality rate was observed whether ECMO was used or not [5]. It was also reported that hemorrhagic complications occurred in nearly half of the patients managed with ECMO in either veno–venous or veno–arterial forms [5]. If the mechanism is directly related to an electrical storm, there should be some difference between the veno–venous or veno–arterial forms, which are

associated with different tissues that have different electrical properties. I accept that the work of Oda et al. is only a case report and does not insist that spinal infarctions are often related to electrical storms. In fact, Oda et al. may have been limited in the management of their case in that the patient may have required immediate systemic perfusion, and veno–venous bypass ECMO may not have been the best choice. The most likely mechanism of spinal cord infarction in this case is poor perfusion during the prolonged chest compression for cardiac arrest, not an electrical storm. Or, the infarction may have been due to the thrombus generated in the extracorporeal circuit, although this is not a common cause. These topics should be kept in mind during the management of any cases.

References

1. Oda T, Yasunaga H, Tsutsumi Y, Shojima T, Zaima Y, Nishino H, Ito S, Todo K. A child with influenza A (H1N1)-associated myocarditis rescued by extracorporeal membrane oxygenation. *J Artif Organs*. 2010 (Epub ahead of print).
2. Wiwanitkit V. A concern on cardiac involvement in swine flu. *Anadolu Kardiyol Derg*. 2009;9:360–1.
3. Duan DW, Li T, Qin YZ, Xu L, Zhao CX, Hu XM, Wu P, Zhang Q, Lang YH. The use of extracorporeal membrane oxygenation in sustaining pulmonary function patients with influenza A H1N1. *Zhongguo Wei Zhong Bing Ji Jiu Yi Xue*. 2010;22:161–3.
4. Grosek S, Osredkar D, Derganc M, Neubauer D, Primožic J. Detection of seizures with amplitude-integrated electroencephalography in a neonate treated with extracorporeal membrane oxygenation. *Zhongguo Dang Dai Er Ke Za Zhi*. 2008;10:547–51.
5. Roch A, Lepaul-Ercole R, Grisoli D, Bessereau J, Brissy O, Castanier M, Dizier S, Forel JM, Guervilly C, Gariboldi V, Collart F, Michelet P, Perrin G, Charrel R, Papazian L. Extracorporeal membrane oxygenation for severe influenza A (H1N1) acute respiratory distress syndrome: a prospective observational comparative study. *Intensive Care Med*. 2010;36:1899–905.

V. Wiwanitkit (✉)
Wiwanitkit House, Bangkhuae, Bangkok 10160, Thailand
e-mail: wviroj@yahoo.com