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Sedation with propofol for 33 days in a patient with acute aortic valve regurgitation and dissecting aneurysm

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To the editor: Propofol is commonly used for the sedation of critically ill patients undergoing mechanical ventilation. Although a case of long-term infusion of propofol for to 32 days [1] has been reported, it has rarely been infused for more than 7 days. We describe a patient who required propofol sedation for 33 days and was discharged without sequelae after aortic valve replacement (AVR), despite a long recovery period.

A 76-year-old man weighing 65 kg had sudden onset of chest and back pain while sleeping. He was diagnosed with a dissecting aneurysm that was partly occluded by thrombus from the distal arch to the descending aorta (45 mm maximum diameter) accompanying a right aortic arch, and pericardial effusion. On the 5th day, tracheal intubation and mechanical ventilation were required because of dyspnea, expiratory wheezing, and hypoxia. Transesophageal echocardiography revealed vegetation and perforation of the left coronary cusp of the aortic valve. Prior to admission, he had had repeated fevers and was treated with antibiotics. We believe, therefore, that aortic valve regurgitation rapidly worsened due to infective endocarditis, which led to the heart failure. Moreover, enteritis from methicillin-resistant *Staphylococcus aureus* and bacterial pneumonia made treatment difficult. On the 37th day, when the hemodynamics had been improved and the pseudolumen of the aneurysm was occluded by thrombus, AVR was performed. Laboratory studies showed normal results except for anemia. The morning after AVR, sedation was stopped. After an hour, the patient opened his eyes when he was called, but he did not respond to our questions until the 47th day.

The total dose of propofol that was required to maintain a Ramsay sedation score of 4–5 was 116000 mg; propofol was started at 150 $mg \cdot h^{-1}$ and was increased to 220 $mg \cdot h^{-1}$ on the 12th day. In addition, midazolam was administered intermittently, because the patient often opened his eyes and moved violently and his blood pressure increased. From the 27th day to the time of AVR, propofol at 140 $mg \cdot h^{-1}$ and midazolam at 6 $mg \cdot h^{-1}$ were infused to provide a satisfactory sedation level and hemodynamic stability. In a computer simulation (STANPUMP), 150 $mg \cdot h^{-1}$ produces a plasma concentration of 1.0 $\mu g \cdot ml^{-1}$, which corresponds to a sedation score of 4 [2]. Although we used the appropriate dose, his sedation level became gradually inadequate. Buckley differentiates tolerance from increased clearance by analyzing plasma concentration [3]. We did not measure plasma concentration, however, so we could not use it to evaluate the patient.

Barr and colleagues reported that a patient would recover when the plasma propofol concentration decreased to 0.25 $\mu g \cdot ml^{-1}$ [2]. According to this, if our patient had received propofol alone to maintain a sedation score of 5, he would have recovered in about 3 days in STANPUMP. However, it took 10 days before he could express himself. We believe that the recovery time might have been determined by the pharmacokinetics and pharmacodynamics of both propofol and midazolam. The recovery time after sedation with midazolam is longer than that with propofol. Moreover, age affects propofol pharmacokinetics, but it influences both the pharmacodynamics and the pharmacokinetics of midazolam [4,5].

We think that propofol is a safe and effective sedative that can be used for more than 7 days in critically ill patients. After propofol administration, recovery time may be influenced by the duration and the depth of sedation, the properties of other sedatives with which it is combined, and the patient's body habitus.

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