Letter to the Editor

Ketamine, Xylazine, and Thiopental: Safety versus Study Design in Animal Anesthesia Models

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Dear Editor

Thiopental sodium, ketamine, and xylazine are three well-known anesthetics belonging to barbiturate, phencyclidine, and alpha agonist families respectively. These drugs are frequently used by veterinarians to achieve analgesia, anesthesia, or both. Recently, a combination of ketamine and xylazine becomes attractive as a result of their safety profile and a reasonable level of anesthesia and analgesia (1-3).

Anesthetic drugs have different effects on many organ systems including the brain, heart, liver kidneys, etc (4-7). We designed an experimental model to evaluate the preconditioning effect of anesthetics on cardiac ischemia-reperfusion. In literature, there is some growing evidence supporting the preconditioning effect of ketamine and xylazine on ischemia-reperfusion injuries in various animal models, although the exact mechanisms are still not clear (8, 9). We used sodium thiopental despite its narrower safety profile; however, almost all of our rats died early (in an hour or two) with standard intraperitoneal doses. Then we decided to use ketamine alone, which was not satisfactory because of inadequate anesthesia for the thoracotomy procedure. Next, we used a combination of ketamine and xylazine, but as expected only a few dysrhythmias were observed after reperfusion, and both heart rate and blood pressure were much lower in these groups of rats, mandating additional doses to maintain anesthesia. Finally, lower than usual doses of sodium thiopental were utilized and titrated to effect to achieve adequate anesthesia while avoiding complications. In conclusion, administering ***titrating doses of sodium thiopental*** may help to avoid fatal complications while eliminating the confounding effect of ketamine and xylazine on our study.

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