

Establishment of an Animal Model of Epidural Anesthesia and Sedative Tail-Flick Test for Evaluating Local Anesthetic Effects in Rats

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Abstract :

The tail-flick (TF) test is the most frequently used method to measure pain levels and assess the effects of anesthesia. In this study, we performed the TF test in rats sedated via an indwelling epidural catheter and then examined the effectiveness of this method in evaluating the local anesthetic effects. First, an epidural catheter was inserted into the epidural space, and anesthetic [lidocaine (L) or lidocaine including adrenaline (AL)] or normal saline (NS) was administered. Under sedation, we measured the dose for disappearance of the TF response, time to TF response recovery, onset and regression of local anesthesia, as well as the effect of an added agent on its continuation. The time course of TF latency (% maximum possible effect) in the NS group did not change during the experiment. In the AL group, TF latency increased significantly more than baseline during the 30-min period after injection. This was also significantly higher than the latency in the NS group and the L group. In the L group, the TF latency increased significantly above baseline for 20 min after injection and was significantly higher than that in the NS group. Due to the fact that we were able to detect the effect of local anesthesia onset and regression, as well as the local anesthesia continuation action of an additive agent, in rats sedated via an indwelled epidural catheter, we consider our method to be an improvement over conventional methods.

Key Word :

epidural rat model, evaluating local anesthetic effect, indwelling epidural catheter, isoflurane, tail-flick test

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