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Poster Session P400

P400 A Comparison of Three Buprenorphine Formulations for Management of Acute Post Operative Pain in Mice

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Buprenorphine is a widely used opioid analgesic for managing post-operative pain in mice. However, there are different formulations available, and their comparative efficacy remains unclear. This study aimed to compare 3 buprenorphine formulations, buprenorphine – HCL subcutaneous (SC), buprenorphine extended-release (XR) injectable solution SC, and buprenorphine transdermal solution (TD) for the management of post-operative pain in mice. Singly housed female C57BL/6 mice (N=9) were implanted with a carotid artery blood pressure monitor with SC telemetry placement under an IACUC approved protocol, and randomly assigned to receive one of the 3 formulations (N=3 per group). Pain behavior was assessed using the Mouse Grimace Scale, nesting behaviors and body weight trends. The mice were assessed by the same individual for consistency and assigned a numerical score based on the 5 grimace scale criteria, nesting behaviors and percent body weight loss. A score of 0 represented no pain behavior observed and a score of 1 or 2 represented varying degree of pain behavior observed. The lowest score a mouse could receive was 0 and the maximum was 14. In addition to the assigned buprenorphine formulation, all mice received meloxicam 5 mg/kg SC on the day of surgery and for 3 days post-operatively for 96 hours of coverage. The results showed that all three formulations attenuated post-operative pain behaviors assessed by the 3 above methods. The TD formulation was found to be the most effective, resulting in the lowest scores and therefore provided sustained analgesic effect over 96 hours. The buprenorphine-HCL group was used as the control group to compare the two other formulations. The buprenorphine-HCL formulation required multiple doses to maintain adequate pain control, the buprenorphine XR and TD formulations provided more consistent coverage with fewer additional doses needed. In summary, all formulations of buprenorphine were effective at controlling post operative pain in mice, but the transdermal formulation provided the most effective pain control with the least amount of intervention. These results provide valuable insights for in vivo researchers and veterinarians when choosing an appropriate buprenorphine regimen for post-operative pain management in mice.