A buprenorphine depot formulation provides effective sustained post-surgical analgesia for 72ăh in mouse femoral fracture models

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Adequate pain management is essential for ethical and scientific reasons in animal experiments and should completely cover the period of expected pain without the need for frequent re-application. However, current depot formulations of Buprenorphine are only available in the USA and have limited duration of action. Recently, a new microparticulate Buprenorphine formulation (BUP-Depot) for sustained release has been developed as a potential future alternative to standard formulations available in Europe. Pharmacokinetics indicate a possible effectiveness for about 72ăh. Here, we investigated whether the administration of the BUP-Depot ensures continuous and sufficient analgesia in two mouse fracture models (femoralăosteotomy)ăand could, therefore, serve as a potent alternative to the application of Tramadol viaăthe drinking water. Both protocols were examined for analgesic effectiveness, side effects on experimental readout, and effects on fracture healing outcomes in male and female C57BL/6N mice. The BUP-Depot provided effective analgesia for 72ăh, comparable to the effectiveness of Tramadol inăthe drinking water. Fracture healing outcome was not different between analgesic regimes. The availability of a Buprenorphine depot formulation for rodents in Europe would be a beneficial addition for extended pain relief in mice, thereby increasing animal welfare.

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