

Merkblatt 03/2015: Analgesie Buprenorphin Maus

Stand: Version von 27. April 2015* [MA non-GLP]

*ersetzt Version von 02. September 2013.

Pain treatment with Buprenorphine in mice

Preliminary remarks

Buprenorphine (Temgesic®) is administered subcutaneously for peri-operative pain relief. Dosage and number of applications depend on the severity of the intervention and on the expected amount of pain after the intervention. Both should be adjusted individually for each operation / surgical intervention.

Based on bibliographical references and clinical experiences (anecdotal evidence) we assume that Buprenorphine has an analgesic effect of about six hours in small rodents after subcutaneous injection of Temgesic. Meanwhile it has also become current practice to add Buprenorphine to the drinking water, although there is no reliable scientific evidence as to its analgesic effect as yet. However, based on clinical experience and first study results, analgesic effects were observed during the dark phase due to the significant increase in drinking frequency of the mice. As no explicit information is available at the moment, some studies are currently in progress to demonstrate the accurate period of the analgesic effect (scientific evidence) regarding both methods of application. The following protocol for pain treatment in mice can be regarded as valid until new results are available or until a revised version of this protocol is released.

Dosage and application interval

Buprenorphine can be given before, during or after the operation. The postoperative application is administered directly after the intervention, when the animal wakes up from anaesthesia and starts lifting the head.

Recommendation of dosage for Buprenorphine is 0.1 mg/kg body weight.

Preparing the solution for injection:

1 ml Temgesic® (Buprenorphine 0.3 mg/ml) is diluted in 5 ml 0.9% NaCl. From this solution 2 µl/g body weight are administered subcutaneously every six hours. After surgeries with expected medium-severe or severe pain, Buprenorphine should be given subcutaneously at least twice every 4 - 6 hours on the same day of the intervention.

Depending on the severity of the intervention continued pain treatment during the night can be necessary. In this case Buprenorphine can be given orally over the drinking water instead of subcutaneous applications.

Standard dosage for medium severe interventions: 5 ml Temgesic® (Buprenorphine 0.3 mg/ml) are diluted in 160 ml drinking water.

After severe interventions it might be necessary to increase the dosage. If the exact amount of the consumed Buprenorphine-enriched drinking water needs to be measured, the mice can be housed individually overnight.

The morning after the intervention the Buprenorphine-enriched drinking water is exchanged for normal drinking water. During the day (light phase) Buprenorphine is administered subcutaneously every 4-6 hours. The first s.c injection must be given no later than 4 hours from the beginning of the light phase. Overnight (dark phase) Buprenorphine can again be administered via the drinking water.

Depending on the severity of the intervention Buprenorphine can be administered up to three days either subcutaneously or orally.

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Adverse effects

After administration of Buprenorphine food intake might be decreased and locomotor activity might be increased in mice. A reduction in body weight following an intervention may be more pronounced after treatment with Buprenorphine.

Remarks concerning subcutaneous injection in mice

Generally a 1ml syringe with a 26G (brown) needle is recommended (according to LTK Module 1).

Equally a so-called 0.5 ml *U-100 INSULIN* syringe with a 29G needle has proven to be useful for the injection of Temgesic® in mice; however, the scale of the insulin units must be converted in µl and the dosage calculated accordingly.

Overview Diagram Mouse

| <i>Mouse</i> | <i>Preparation of the solution</i> | <i>Dosage and application interval</i> |
|---|---|---|
| Buprenorphine Solution for subcutaneous injection | 1 ml Temgesic® (Buprenorphine 0,3 mg/ml) + 5 ml NaCl | 2 µl/g body weight = 0,1 mg/kg BW subcutaneous injection 2-3 times during the day (light phase) every 4-6 hours. The first injection must be given max. 4 hours after the beginning of the light phase in the animal room. On the day of surgery if necessary every 4 hours s.c injections. |
| Buprenorphine Oral application | 1 ml Temgesic® (Buprenorphine 0,3 mg/ml) + 32 ml drinking water or 5ml Temgesic® (Buprenorphine 0,3 mg/ml) + 160 ml drinking water | 1 mg/kg via the drinking water |