

Tramadol minimizes potential pain during post-oophorectomy in Wistar rats

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Abstract

The use of analgesic to prevent or treat post-operative pain in rodents is increasingly encouraged as a refinement method. Limited data is regarding the use of opioids in laparotomy-induced abdominal pain of laboratory animals. Thirty-three Wistar rats (219.3±16.6g) underwent bilateral oophorectomy under xylazine-ketamin anesthesia (25mg/kg and 100mg/kg i.m. respectively). The analgesic effect of tramadol (5mg/kg i.m.) was evaluated on post-surgery recovery in one group (n=13) and compared to the non-tramadol group (n=20) during 30 days. Tramadol was injected in sedated animals 1-2 minutes before the surgical incision. Recovery was determined by changes in body weight (BW) assessed every 7 days. At the first week, less BW loss was noticed in the tramadol-treated group (-0.2%) compared to the non-tramadol group (-2.4%) (T test p=0.05). BW gain started at the second week and no significant difference was noticed between the groups. However, lower BW was detected all the time in the non-tramadol group compared to the tramadol-treated, reaching respectively 244±21.9g and 259±16.7g in 30 days. Tramadol administration minimizes BW loss during post-oophorectomy and did not cause any adverse effects under this anesthetic regimen. The preoperative analgesic protocol with the opioid tramadol was effective in order to reduce post-operative pain and improve post-surgery recovery.

Keywords: refinement, tramadol, analgesia, pain, oophorectomy

Introduction

The use of analgesic to prevent or treat post-operative pain in rodents is increasingly encouraged as a refinement method. Administration of exogenous opioids may cause effective analgesia without adverse symptoms from the central nervous system (Garlicki et al, 2006). Tramadol hydrochloride is a centrally acting opioid analgesic, the efficacy and potency of which is only five to ten times lower than that of morphine (Giusti et al, 1997). Limited data is regarding the use of opioids in laparotomy-induced abdominal pain of laboratory animals. The use of tramadol was evaluated in Wistar rats undergoing oophorectomy.

Material and methods

Thirty-three Wistar rats (219.3±16.6g) underwent bilateral oophorectomy under xylazine (ANASEDAN VETBRANDS) and ketamin (CRISTALIA) anesthesia (25mg/kg and 100mg/kg i.m. respectively) (Piovesan et al, 2005). The analgesic effect of 5mg/kg tramadol (TRAMALIV TEUTO) via i.m. was evaluated on post-surgery recovery in one group (n=13) and compared to the non-tramadol group (n=20) during 30 days. Tramadol was injected in sedated animals 1-2 minutes before the surgical incision. Recovery was determined by changes in body weight (BW) assessed every 7 days.

Bilateral oophorectomy followed the norms of vivisection of animals recommended by the Brazilian School of Animal Experimentation (COBEA). The work was approved by the Committee of Ethics in Research of the College of Medicine / Antônio Pedro, University Hospital / Fluminense Federal University.

All rats were created and maintained in the Animal Facility of the Laboratory of Experimental Nutrition (LABNE - UFF). Rats were housed in individual plastic cages, with controlled temperature ($24 \pm 2^\circ\text{C}$) and alternated artificial illumination in cycles of 12/12 hours. Filtered water and commercial food (NUVITAL) was supplied ad libitum.

Results & discussion

At the first week, less BW loss was noticed in the tramadol-treated group (-0.2%) compared to the non-tramadol group (-2.4%) (T test $p=0.05$). BW gain started at the second week and no significant difference was noticed between the groups. The BW gain in 30 days was 14.7% in the tramadol-treated group and 13.5% in the non-tramadol group. However, lower BW was detected all the time in the non-tramadol group compared to the tramadol-treated, reaching respectively $244 \pm 21.9\text{g}$ and $259 \pm 16.7\text{g}$ in 30 days (Fig. 1).

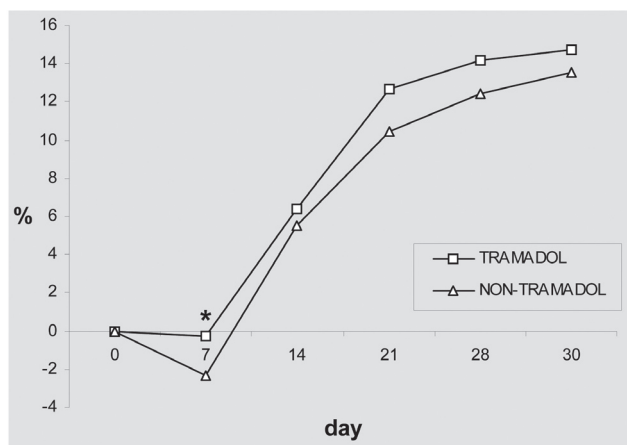


Fig. 1 Body weight variation in ovariectomized rats under tramadol analgesia. * Student T test $p=0.05$.

Refinement represents experimental techniques implemented with the purpose of enhancing animal welfare and minimizing any potential pain, distress or suffering of those animals used during scientific procedures (Flecknell, 1994). Surgical procedures cause significant reduction in food and water consumption, body weight and locomotor activity (Liles & Flecknell, 1993). Post-surgery recovery started early in the tramadol-treated group, noticed by food and water intake. Tramadol administration, as a refinement technique, minimized BW loss during post-oophorectomy and did not cause any adverse effects under this anesthetic regimen.

Conclusion

The preoperative analgesic protocol with the opioid tramadol was effective in order to reduce post-operative potential pain and improve post-surgery recovery.

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