

## **Analgesic treatment of rats subjected to spinal cord injury using conventional laminectomy: Effects on well-being and functional outcome**

**Harikrishnan Vijayakumar Sreelatha<sup>1</sup>, Ansar Fasaludeen<sup>2</sup>, Lissy K. Krishnan<sup>3</sup>, Hamza Palekkodan<sup>4</sup>, Klas S.P. Abelson<sup>2</sup>**

*<sup>1</sup>Sree Chitra Tirunal Institute for Medical Sciences & Technology BMT Wing, India, <sup>2</sup>University of Copenhagen, Denmark, <sup>3</sup>Dr. Moopen's Medical College, Wayanad, India, <sup>4</sup>Kerala Veterinary and Animal Sciences University, India*

The contusion-induced spinal cord injury (SCI) rat model is widely employed in preclinical research. The model involves laminectomy at the lower thoracic (T10-T11) level followed by contusion of the spinal cord tissue with a pre-defined force. Despite the high severity classification, reporting of analgesic treatment in scientific literature is scarce. This study was designed to test whether analgesic treatment would improve the animals' well-being without negatively affecting the validity of the model by interfering with functional outcomes. Forty-two female Wistar rats (CrI:WI) randomly divided into six equal groups underwent conventional laminectomy and contusion SCI of high severity was induced with 200 kdyn force. The six groups received analgesic treatments subcutaneously for five post operative days: 1) Tramadol (5mg/kg) and buprenorphine (0.05mg/kg); 2) carprofen (5mg/kg) and buprenorphine (0.05mg/kg); 3) carprofen (5mg/kg); 4) meloxicam (1mg/kg) and buprenorphine (0.05mg/kg); 5) meloxicam (1mg/kg); and 6) no analgesia (0.5 ml sterile saline)). Body weight changes, Rat Grimace Scale (RGS), and activity in cages during dark phase were used to assess animal well-being, and Basso, Beattie and Bresnahan (BBB) scoring, Novel Object Recognition (NOR) test, von Frey test, and histopathology were employed to assess functionality during the 8-week study period. None of the analgesia-treated groups exhibited any significant low well-being scores, whereas there were no differences in functional scores, indicative of the fact that analgesics shall be employed in SCI studies involving the contusion-induced SCI rat model.