The Old School, Brewhouse Hill, Wheathampstead,
Hertfordshire AL4 8AN, UK

Animal Welfare 2011, 20: 225-237
ISSN 0962-7286

Potential behavioural indicators of post-operative pain in male laboratory rabbits following abdominal surgery

MJ Farnworth*†, JK Walker†, KA Schweizer‡, C-L Chuang§, S-J Guild§, CJ Barrett§, MC Leach# and NK Waran†

† Animal Welfare Group, Department of Natural Sciences, Unitec Institute of Technology, Private Bag 92025, Auckland, New Zealand
‡ Royal (Dick) School of Veterinary Studies, University of Edinburgh, Easter Bush Veterinary Centre, Easter Bush, Roslin EH25 9RG, UK
§ Department of Physiology, Private Bag 92019, University of Auckland, Auckland, New Zealand
# Comparative Biology Centre, Medical School, University of Newcastle, Newcastle-upon-Tyne NE2 4HH, UK
* Contact for correspondence and requests for reprints: mfarnworth@unitec.ac.nz

Abstract

This study aimed to identify behaviours that could be used to assess post-operative pain and analgesic efficacy in male rabbits. In consideration of the 'Three Rs', behavioural data were collected on seven male New Zealand White rabbits in an ethically approved experiment requiring abdominal implantation of a telemetric device for purposes other than behavioural assessment. Prior to surgery, rabbits were anaesthetised using an isoflurane/oxygen mix and given Carprofen (2 mg kg^{-1}) as a peri-operative analgesic. Rabbits were housed individually in standard laboratory cages throughout. Data were collected at three time periods: 24–21 h prior to surgery (T1) and, post-surgery, 0–3 h (T2) and 3–6 h (T3). Behavioural changes were identified using ObserverXT, significance of which was assessed using a Friedman's test for several related samples. The frequency or duration of numerous pre-operative behaviours was significantly reduced in T2 and T3, as compared to T1. Conversely, novel or rare behaviours had either first occurrence or significant increase in T2 into T3 as compared to T1, these include 'full-body-flexing', 'tight-huddling', 'hind-leg-shuffling'. We conclude that reduced expression of common pre-operative behaviours and the appearance of certain novel post-operative behaviours may be indicative of pain in rabbits. Behaviours identified as increased in T2 as compared to T1 but not consistently elevated into T3 were considered separately due to the potentially confounding effect of anaesthesia recovery. These included lateral lying, 'drawing-back', 'staggering' and 'closed eyes'. We postulate that for effective application of best-practice post-operative care, informed behavioural observation can provide routes by which carers may identify requirements for additional post-operative analgesia. Additionally, improvement of the peri-operative pain management regimen may be required to ameliorate the immediate effects of abdominal surgery. Comparisons with other studies into post-operative pain expression in rabbits suggest behavioural indicators of pain may differ, depending on housing and surgical procedure.

Keywords: *analgesia, animal welfare, behaviour, pain, peri-operative, rabbit*