Pain Assessment and Pain Alleviation in Laboratory Animals (3-Dec-2002)

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Our main interest is in the assessment and alleviation of pain in laboratory animals, although we also undertake research in the area of anaesthesia. Our major aim has been to develop methods of pain assessment, since we believe that the current low level of use of analgesics in animals is a direct result of our poor ability to recognise pain. If we cannot recognise how much pain an animal is experiencing we cannot know how much analgesic should be given, what type of drug should be used, and when additional analgesic should be administered. Although there are many approaches to assessing animal pain, we have directed our work primarily towards behaviour-based systems. The main reason for this is that we wish to develop pain-scoring techniques that could be applied by non-specialists, and used to modify analgesic regimens in individual animals.

Initially, our work was undertaken in rats, since this species is frequently used in biomedical research. Our earlier studies used changes in food and water consumption and body weight as indicators of the effects of surgery, and we also used some simple behavioural measures [1,2,3]. These simple measures were useful, but were essentially retrospective assessments, which would not allow immediate changes to an analgesic regimen.

We therefore progressed to detailed examination of post-operative behaviour in rats and identified a range of quantifiable behaviours (pain indicators). These have strong predictive value in distinguishing between groups of animals given different analgesic treatments. We included a number of control groups in these studies, in order to assess the influence of anaesthesia and analgesic administration in normal animals. The studies using carprofen and ketoprofen [4] were successful, but we identified some major difficulties when administering the opioid buprenorphine. This analgesic, in common with other opioids, produces marked behavioural effects in normal rodents. These effects confound the interpretation of its actions following surgery [5].

These studies were undertaken under carefully controlled conditions, with prolonged periods of observation using red-light illumination. Our next step was to determine whether the changes could be identified in a different age and strain of rat, undergoing a different surgical procedure. Furthermore, we wished to undertake the assessments rapidly, and in a way that could be applied routinely in a research animal facility. We have demonstrated that other surgical procedures do produce similar behavioural changes, and that these changes can be identified over a short period of observation (10 mins) (paper submitted). We have also determined that the behaviours can be identified by relatively inexperienced staff after a very short training period (2h).

We are currently extending our investigations to incorporate a wider range of surgical procedures in rats, and to determine if similar behavioural changes occur in other laboratory species (rodents and rabbits).

References


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