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Critically Appraised Topic

Can ovariectomy be justified on grounds of behaviour?

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Clinical scenario

In practice, clinicians are commonly presented with mares reportedly behaving 'badly' either persistently or at regular or irregular intervals. This behaviour is often presumed by the owners or riders to be due to their mares being in oestrous or their reproductive hormone balance. Undesirable behaviour is varied and includes an unwillingness to respond to rider instruction or signals, bucking, rearing, overt reproductive behaviours, aggression and stallion-like behaviour (Hedberg *et al*. 2007a; Kamm and Hendrickson 2007; Crabtree 2011). It is assumed that when considering these behavioural problems, the behaviour in question has been confirmed by the clinician to be temporarily associated with the oestrus cycle or with ovarian pain and not musculoskeletal, soft tissue, gastric or dental pain. The question has been refined to exclude those behavioural issues experienced due to the presence of granulosa cell tumour (GCT; Crabtree 2011). These criteria define the population of mares for the question, 'can ovariectomy on grounds of behaviour be justified?' The question is not an ethical one, rather whether or not behaviour can be improved with surgery.

Search strategy

Pubmed/Medline (http://www.ncbi.nlm.nih.gov/pubmed), the University of Liverpool electronic library search (http://www.liv.ac.uk.ezproxy.liv.ac.uk/library) and IVIS (http://www.ivis.org): ovariectomy AND mare AND behaviour. Hand searching of references in all articles identified and those within the author's knowledge was conducted. In addition a request for references and opinions was made via a private worldwide equine reproduction e-mail network.

Quantity of evidence

Sixteen, 41 and 18 papers were retrieved respectively; relevance screening was conducted based on abstracts identifying 3 papers applicable to the question in the last 30 years. Of the 3 papers there was one randomised controlled trial (Hedberg *et al*. 2007b) and 2 retrospective studies (Hooper *et al*. 1993; Kamm and Hendrickson 2007).

Quality of evidence

The study by Hooper and co-workers (1993) looked retrospectively at 23 cases of bilateral ovariectomy between 1984 and 1990 by client survey. Of the 23 cases, 16 were for the purpose of behaviour modification and 7 were for other reasons not including ovarian pathology. Kamm and Hendrickson (2007) reported the results of a retrospective study of 35 cases between 1996 and 2005 by client survey. The reported data included both bilateral and unilateral ovariectomy with the latter being due to ovarian pathology. Twenty-three mares had bilateral ovariectomy for behavioural problems. These retrospective observational studies, based on client opinion, represent relatively weak evidence; in addition they are inherently biased. The study by Hedberg and co-workers (2007b) primarily looked at the effect of ACTH (tetracosactide) on steroid hormone levels in 5 intact vs. 5 ovariectomised mares. The mares acted as their own controls and the study was conducted in successive years (2003–2004). Of the parameters measured, oestrous behaviour was assessed by daily teasing with a stallion. Teasing behaviour was assessed using a standardised protocol and scored. This prospective case–control design has greater evidentiary value than the retrospective study despite the low numbers. Teasing scores however, were not subject to statistical analysis and remained observational. This paper formed part of a greater work which looked at the adrenal response to ACTH between normal and 'problem' mares (Hedberg *et al*. 2007a).

Clinical implications

Hedberg and co-workers (2007b) demonstrated that ovariectomy resulted in continued displays of sexual receptiveness in all mares with a loss of normal cyclic activity. Ovariectomised mares showed more days of oestrus compared with when they were intact; 44 days of oestrus for all intact mares compared with 152 days for all ovariectomised mares during the study period. One ovariectomised mare showed 78 consecutive days of oestrus. This finding is supported by the author's experience and earlier published observations that ovaries are not essential for oestrus behaviour in the mare (Asa *et al*. 1980; Wesson and Ginther 1981).

Hooper and co-workers (1993) reported that 35% of mares demonstrated continued oestrus behaviour. In 9% of cases this was judged to be 'objectionable' by the owners. Of 12 performance mares, 10 were judged to be competing at greater than preoperative levels. In the report by Kamm and Hendrickson (2007) 22% of owners reported that they were either impartial or dissatisfied mainly due to a failure of behavioural change following surgery. More generalised behavioural problems were more likely to be corrected with an ovariectomy than more specific behavioural issues. Aggressive behaviour and a generalised disagreeable demeanour were most commonly corrected (86 and 81% respectively), followed by excitability (75%), kicking and biting (73%), and problems during training that related to oestrus-like behaviour (72%). Problems with other horses and frequent urination were less likely to be improved after surgery (64%). None of the studies addressed the concept of ovarian pain as a cause of subtle behavioural issues encountered in ridden competition horses.

Clinical message

The current data would suggest that if the undesirable behaviour which prompts presentation is normal sexual

(oestrus) behaviour then the likelihood is that ovariectomy will not correct the problem. In fact ovariectomy may make the situation worse as oestrus behaviour may become irregular and/or persistent post surgery. If the behaviour is aggressive in character then ovariectomy is more likely to be a successful therapy but the evidence for this is weak. If ovarian pain is considered as a cause of abnormal behaviour then inducing ovarian inactivity via the use of a GnRH vaccine may be a viable option that does not require surgery, however, mares vaccinated against GnRH will also demonstrate oestrus behaviour (Dalin *et al*. 2002). Future studies with accurate definition of the cause, or characteristics of, the behaviour with matched controls may enable a more definitive answer to the question.

Author's declaration of interests

No conflicts of interests have been declared.

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