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Empathic veterinarians score cattle pain higher

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A B S T R A C T
The treatment of cattle pain often relies upon veterinarians. The aim of this study was to qualify the influence of veterinarians skills, attitudes, and empathy on cattle pain assessment and consequently disbudding pain management. A web-based questionnaire was sent to Finnish veterinary students in either the preclinical or clinical stage, and also to production-animal practice oriented veterinarians. The questionnaire recorded demographics, statements of opinions, pain scoring of cattle conditions and procedures. Empathy towards humans (Interpersonal Reactivity Index, IRI) and reworded IRI to measure empathy towards animals were also covered.

The overall response rate was approximately 40%. The association between pain and empathy scores were analyzed by Pearson’s correlation, and the factors affecting pain scores and empathy towards animals analyzed using linear models. The need for pain medication of calves during disbudding was well recognized and the intention to treat such pain was very common. Higher mean scores for cattle pain were associated with greater empathy towards humans. On average, respondents’ empathy towards animals was greater than towards humans, and was associated with respondents’ empathy towards humans, family size and attachment to family pet.

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Introduction
Recognition of animal pain is an essential prerequisite for the treatment of pain in animals (Paul and Podberscek, 2000; Huxley and Whay, 2006; Hewson et al., 2007a). The scoring of animal pain depends on veterinary medical education, attitudes to animal pain, sex, age and empathy of the individual (Capner et al., 1999; Raekallio et al., 2003; Huxley and Whay, 2006; Ellingsen et al., 2010; Fajt et al., 2011).

Empathy is considered a measurable trait and one common approach to its assessment is the Interpersonal Reactivity Index (IRI) self-evaluating questionnaire (Davis, 1980) for which empathic concern (EC) and perspective taking (PT) factors are considered to be the most relevant (Davis, 1983; Alterman et al., 2003; Pedersen, 2009). Variation in empathy skills seems to be associated with the haemodynamic brain responses of subjects while observing non-verbal signs of pain (Saarelä et al., 2007). Additionally, physiological changes in the brain seem to be similar whether the subjects are experiencing or witnessing pain (Morrison et al., 2004; Corradi-Dell’Acqua et al., 2011; Lamm et al., 2011).

There is limited information on how empathy towards animals can be measured. Paul (2000) modified the questionnaire created by Mehrabian and Epstein (1972) into a tool for measuring empathy towards animals and this has been used by other researchers (Taylor et al., 2004; Ellingsen et al., 2010). Angantyr et al. (2011) used a narrative technique to measure animal-oriented empathy. In addition, alterations in skin conductance and heart function as a physiological sign of empathetic reactions have been associated with watching movies of animals in trouble (Westbury and Neumann, 2008).

Empathy is modulated by the features of the target and the relationship between the empathizer and the target (Vignemont and Singer, 2006; Avenanti et al., 2010). The question to be answered about empathy towards animals is how alike do we feel or how close a relationship do we feel we have with them? In the absence of published studies we can only assume that veterinarians have a high level of empathy for animals compared to the general population due to their choice of occupation. However, empathy scores usually decline during the course of education in both human doctors (Neumann et al., 2011) and veterinarians (Hazel et al., 2011). In addition, habituation to non-verbal pain signs has been shown to occur among human health care professionals (Cheng et al., 2007). Empathy is also affected by sex, with females having been
shown to be more empathic towards animals and to score their pain higher (Capner et al., 1999; Paul and Podbersek, 2000; Huxley and Whay, 2006; Kielland et al., 2009). Women also outperform men in detection of facial cues of pain (Prkachin et al., 2004).

In human medicine empathy is considered important because it facilitates the acquisition of information for diagnoses and the transmission of therapies (Neumann et al., 2011). For production animal medicine we hypothesized that veterinarians perception and intention treat disbudding pain may be enhanced by their empathetic abilities.

The aim of this study was to examine the attitudes of Finnish veterinary students and production animal veterinarians to pain management in cattle. Sensitivity to animal pain was assessed by questions about pain scoring and empathy towards animals. In addition, the effects of sex, education, work-experience and empathy for humans were evaluated as potential contributing factors towards pain recognition.

Materials and methods

A web-based questionnaire was sent to Finnish veterinarians and veterinary students pursuing degree or opportunities for continuing education. The questionnaire was delivered via e-mail to students in the preclinical stage (1st and 2nd years), to students in the clinical stage (5th and 6th years), and to production animal oriented veterinarians. One reminder e-mail was sent.

The questionnaire began by explaining the aim of the survey and an estimation of the time required. In addition, the voluntary nature of the responding and the anonymous handling of the data were emphasized. The first questions were demographic including questions concerning relations to animals and ownership of a pet. In the next section the respondents indicated which of the following they would choose to treat disbudding pain in calves: (1) sedation; (2) oral or injectable analgesics (all analgesics substances registered for pain treatment of calves in Finland are non-steroidal anti-inflammatory drugs); (3) local anaesthetics. This section was followed by statements about pain in cattle to agree or disagree using a 5-point Likert scale. Respondents were then asked to rate the painfulness of 13 named conditions or procedures of cattle, on a scale ranging from 0 to 10.

The last section of the questionnaire consisted of Interpersonal Reactivity Index (IRI) statements (Davis, 1980) and the perspective taking (PT) and empathic concern (EC) subscales of the IRI were reworded to obtain a measurement of empathy towards animals. Empathy statements were scored on a 5-point scale ranging from 0 to 4. Altogether, the questionnaire included 99 closed questions.

Statistical analysis

The relationship between mean pain scores, human IRI empathy scores and empathy for animals IRI were analyzed using Pearson’s correlation. The differences between empathy towards animals and humans were analyzed by using a paired samples t test.

Factors affecting pain scores and scores of empathy towards animals were analyzed using two separate linear models. Years of education, experience as a veterinarian, or sex had no effect on empathy towards animals. Mean scores of empathy towards animals are shown in Table 3.

On average, scores of empathy towards animals were higher compared to empathy towards humans (Table 4). The mean pain scores, empathy subscales and empathy towards animals were all positively correlated with each other (Table 5).

Discussion

In this study we found that the empathy skills of veterinarians had an effect on their pain scoring. Veterinarians seemed to be more empathetic towards animals than towards humans. Empathy towards humans was positively associated with pain scores and we were able to infer a positive association between self-reported empathy towards animals and pain scoring of cattle. A similar association of empathy towards animals and dog pain rating has been previously shown for dog owners (Ellingsen et al., 2010). Along the same line, empathy has been previously associated with higher pain scores assigned for humans (Green et al., 2009).

Human and animal oriented empathy were associated with each other, but only moderately, which indicated that other factors also affect empathy towards animals. Empathy towards animals was positively associated with a greater empathy overall but also with an attachment to a family pet. Having a pet has been previously associated with animal empathy and higher scores for animal pain recognition (Paul, 2000; Ellingsen et al., 2010). Current and past pet ownership were very common among our study population, so affection for the family pet was measured in order to get information about the closeness of relationship to animals. Frequent kissing of pet dog has been linked with higher oxytocin concentrations of owners (Handlin et al., 2012), perhaps clarifying the mechanisms behind the association between pet ownership and

### Table 1

Demographic background of respondents (mean ± SD).

<table>
<thead>
<tr>
<th></th>
<th>All together</th>
<th>Preclinical students</th>
<th>Clinical students</th>
<th>Graduated veterinarians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of respondents</td>
<td>189</td>
<td>62</td>
<td>57</td>
<td>70</td>
</tr>
<tr>
<td>Age</td>
<td>31 ± 11</td>
<td>23 ± 4</td>
<td>26 ± 2</td>
<td>42 ± 10</td>
</tr>
<tr>
<td>Family size</td>
<td>2.5 ± 1.6</td>
<td>2.4 ± 1.7</td>
<td>1.6 ± 0.8</td>
<td>3.3 ± 1.5</td>
</tr>
<tr>
<td>Years of education</td>
<td>17 ± 3</td>
<td>14 ± 2</td>
<td>18 ± 3</td>
<td>20 ± 3</td>
</tr>
<tr>
<td>Years of experience</td>
<td>5 ± 9</td>
<td>0 ± 0</td>
<td>0 ± 1</td>
<td>14 ± 10</td>
</tr>
</tbody>
</table>
empathy towards animals. This also suggests that there is a general link between emotional attachment to one individual pet and empathy towards all animals instead of sensitivity being driven by merely attitudes towards animals.

We found an association between empathy towards animals and larger family size of respondents. This finding is in agreement with the results of Kielland et al. (2009), who found that having a larger number of siblings was associated with higher pain scores. However, Paul (2000) reported that having a child at home did not have an effect on animal oriented empathy, and Ellingsen et al. (2010) reported an inverse association between a household size and empathy towards animals. These results indicate that more detailed analysis is needed of the interactions between family size, relationships within family units, and empathy towards animals.

Finnish veterinarians and the veterinary students in our study showed higher empathy scores towards animals as measured by modified IRI questionnaire compared to how they scored with the traditional IRI questionnaire. In earlier studies that used different methods, animal directed empathy has also been found to be greater than human-directed empathy (Paul, 2000; Angantyr et al., 2011). Although our scores for IRI were lower than those reported by Daly and Morton (2009) and by Hazel et al. (2011), they were in accordance with another Finnish study by Silfver and Helkama (2007). Lower scores obtained from Finnish studies possibly reflect cultural differences between nationalities in this respect (Silfver-Kuhalampi, 2009).

According to our results, most veterinarians and clinical phase students would treat cattle disbudding pain with sedation, analgesics and local anaesthetics, according to the current best practice.
Correlations of the Interpersonal Reactivity Index (IRI) empathy towards humans and towards animals using the Interpersonal Reactivity Index (IRI).

In this survey, differences within row (* considered 'strongly with the statement 'The calf requires no pain medication for disbudding', which indicated that both groups consider pain alleviation an important issue. Parallel to this, the respondents also considered 'Animal welfare important to them in their work'.

Thomsen et al. (2012) reported highly positive attitudes towards use of analgesics in dairy cows by Danish veterinarians, which suggest a high animal welfare awareness among Nordic veterinarians. This awareness was also reflected in the scores for disbudding pain without medication which were higher in this study than those reported in the UK and the US (Huxley and Whay, 2006; Hewson et al., 2007b; Fajt et al., 2011). Both Finnish production animal veterinarians and clinical phase students disagreed strongly with the statement 'The calf requires no pain medication for disbudding', which indicated that both groups consider pain alleviation an important issue. Parallel to this, the respondents also considered 'Animal welfare important to them in their work'.

Thomsen et al. (2012) reported highly positive attitudes towards use of analgesics in dairy cows by Danish veterinarians, which suggest a high animal welfare awareness among Nordic veterinarians. This awareness was also reflected in the scores for disbudding pain without medication which were higher in this study than those reported in the UK and the US (Huxley and Whay, 2006; Fajt et al., 2011). The relatively high sensitivity to pain revealed in current survey may be partly driven by the large proportion of females within veterinary profession in Finland. Although not significant in our sample, the effect of sex has been reported before, with females showing better pain recognition skills (Capner et al., 1999; Huxley and Whay, 2006; Kielland et al., 2009; Wikman et al., 2013).

Veterinarians with a production animal orientation may rank animal pain lower than veterinarians in general (Kielland et al., 2009). In addition, production animals are often assumed to be less sensitive to pain compared to pets (Raekallio et al., 2003; Huxley and Whay, 2006; Vinuela-Fernandez et al., 2007). However, the majority of respondents in this study contradicted in this regard.

Conclusions

Scoring of cattle pain by veterinary students and production-animal veterinarians was associated with empathy towards both animals and humans. A majority of Finnish veterinarians tested recognized and intended to treat cattle disbudding pain well, and animals were shown to be potent stimuli for empathy with veterinarians who demonstrated higher empathy towards animals than humans.

Conflict of interest statement

None of the authors of this paper has a financial or personal relationship with other people or organizations that could inappropriately influence or bias the content of the paper.

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