Visceral pain

– a minor or overlooked problem in cattle?

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Visceral pain is pain arising from the internal organs (viscera). A basic search at Web of Science with Topic =”visceral pain” OR ”adominal pain” AND Topic = cattle OR cow* OR bovin* resulted in only 54 hits when refined for veterinary or Agriculture Dairy animal science. . Using the search criteria Topic = ”pain” NOT ”visceral” OR ”abdomen” AND Topic = ”cattle” OR ”cow*” OR ”bovin*” revealed 603 hits which may mirroring that in cattle research most focus has been on somatic pain. In a clinical setting several diseases are known to be painful including, among others, abomasal ulcer (at least in the severe cases), abomasal distension, displacements, peritonitis and metritis and the clinical signs of pain may include depression, colic, teeth grinding, facial expression and increased heart and respiratory rate. So the existence of visceral may not be the question rather how it can be quantified and also how it is best treated. But what about possible visceral pain in bovines related to low grade abomasal ulcers and a chronic inflammation in the intestines like Johne's disease? To my knowledge, no reports on those topics exist. However, in humans, no abdominal pain was identified in half the patients diagnosed with bleeding gastric ulcer. Also in humans, inflammatory bowel disease include morbus Crohn, and are generally associated with visceral pain, although the pain is rarely quantified. In order to asses and quantify possible pain related to abomasal ulcer and Johne’s Disease in cattle more research is needed.

Compared to somatic pain the pain processing mechanism of visceral pain is poorly understood. However some distinctive features can be identified such as the lack of specialized nerve terminals limiting the number of stimulus responses to distension, ischemia and inflammation. Further, the receptive fields are widely overlapping and first order afferents aborize over several spinal segments making the visceral pain diffuse and hard to localize. Also compared to somatic pain, visceral pain more often trigger emotional and autonomic responses (e.g. the increased heart rate).

Drugs that are normally used to treat somatic pain may have lesser effect in treatment of visceral pain because of neurophysiological differences between somatic and visceral pain processing. Further, in treatment of visceral pain, the viscera are not only the target of the pain treatment but also the target of the adverse effects. In cattle practice, the NSAID’s would be the drugs of choice to treat acute visceral pain. Medical treatment of chronic visceral pain, if identified, would only be possible in a short period of time due to legislation and costs. In humans NSAID’s have been shown to deteriorate clinical symptoms of inflammatory bowel disease. Nowadays, the use of opioids in cattle is not possible in a practical setting. However, animal models have shown that opioids targeting the kappa receptor, like butorphanol and buprenorphin, may be superior to those targeting the mu receptor, like morphine, in terms of analgesic effect and fewer adverse effects.