MedicalXpress

Scientists create mouse grimace scale to help identify pain in humans and animals

May 9 2010

A new study by researchers from McGill University and the University of British Columbia shows that mice, like humans, express pain through facial expressions.

McGill Psychology Prof. Jeffrey Mogil, UBC Psychology Prof. Kenneth Craig and their respective teams have discovered that when subjected to moderate pain stimuli, mice showed discomfort through facial expressions in the same way humans do. Their study, published online May 9 in the journal Nature Methods, also details the development of a Mouse Grimace Scale that could inform better treatments for humans and improve conditions for lab animals.

Because pain research relies heavily on rodent models, an accurate measurement of pain is paramount in understanding the most pervasive and important symptom of chronic pain, namely spontaneous pain, says Mogil.

"The Mouse Grimace Scale provides a measurement system that will both accelerate the development of new analgesics for humans, but also eliminate unnecessary suffering of laboratory mice in biomedical research," says Mogil. "There are also serious implications for the improvement of veterinary care more generally."

This is the first time researchers have successfully developed a scale to measure spontaneous responses in animals that resemble human responses to those same painful states.

Mogil, graduate student Dale Langford and colleagues in the Pain Genetics Lab at McGill analyzed images of mice before and during moderate pain stimuli - for example, the injection of dilute inflammatory substances, as are commonly used around the world for testing pain sensitivity in rodents. The level of pain studied could be comparable, researchers said, to a headache or the pain associated with an inflamed and swollen finger easily treated by common analgesics like Aspirin or Tylenol.

Mogil then sent the images to Craig's lab at UBC, where facial pain coding experts used them to develop the scale. Craig's team proposed that five facial features be scored: orbital tightening (eye closing), nose and cheek bulges and ear and whisker positions according to the severity of the stimulus. Craig's laboratory had previously established studying facial expression as the standard for assessing pain in human infants and others with verbal communication limitations. This work is an example of successful "bedside-to-bench" translation, where a technique known to be relevant in our species is adapted for use in laboratory experiments.

Continuing experiments in the lab will investigate whether the scale works equally well in other species, whether analgesic drugs given to mice after surgical procedures work well at their commonly prescribed doses, and whether mice can respond to the facial pain cues of other mice.

Provided by University of British Columbia