

CLAIMS

1. A method for assessing pain caused by administration of a drug solution, the method comprising:

preparing a mammalian experimental animal having a predetermined part of a body and a skeletal muscle bent by a spinal reflex when a stimulus is applied to the predetermined part; the predetermined part being a plantar subcutaneous and the skeletal muscle being a semitendinosus muscle;

anesthetizing the experimental animal by inhalation anesthesia;

inserting a measurement electrode (24) into the semitendinosus muscle of the anesthetized experimental animal;

puncturing an injection needle (18) into the plantar subcutaneous of the anesthetized experimental animal while measuring a myoelectric potential of the semitendinosus muscle by the measurement electrode (24);

starting administering a drug solution to the plantar subcutaneous of the anesthetized experimental animal through the injection needle (18) after a lapse of one second or more since a myoelectric response caused by the punctuation of the injection needle (18) has disappeared; and

separate the myoelectric response caused by the

punctuation, by performing at least one of measurement of a duration time of the myoelectric response caused by the administration of the drug solution and measurement of an EMG intensity obtained by integrating absolute values of myoelectric potentials during a period from occurrence of the myoelectric response by the administration of the drug solution to disappearance of the myoelectric response;

and measure the myoelectric response caused by the administration of the drug solution.

2. The method for assessing pain caused by administration of a drug solution according to claim 1,

wherein, to a plurality of administration sites of the predetermined part of the experimental animal, a plurality of the drug solutions having different compositions is

administered under an identical administration condition or the drug solution having an identical composition is administered under different administration conditions.

3. The method for assessing pain caused by administration of a drug solution according to claim 2,

wherein the experimental animal is a rat (12).

4. The method for assessing pain caused by administration of a drug solution according to claim 3,

wherein a dose per site at the plurality of administration sites is a range of 10 to 100 μ L.

5. The method for assessing pain caused by administration

of a drug solution according to claim 4, wherein

an interval between the administration sites, adjacent to each other, is set to be 2 mm or more.

6. The method for assessing pain caused by administration
5 of a drug solution according to any one of claims 3 to 5, wherein

a total dose at the plurality of administration sites is 200 μ L or less.

7. The method for assessing pain caused by administration
10 of a drug solution according to any one of claims 3 to 6, wherein

an administration rate of the drug solution is a range of 5 to 100 μ L/sec.

8. The method for assessing pain caused by administration
15 of a drug solution according to any one of claims 1 to 7, wherein

a bipolar electrode is used as the measurement electrode (24), and

a reference electrode (26) is pasted to a thoracic skin
20 surface (12c) of the experimental animal.

9. A method for selecting drug solution administration, the method comprising:

a preparation step of preparing a mammalian experimental animal having a predetermined part of a body
25 and a skeletal muscle bent by a spinal reflex when a

stimulus is applied to the predetermined part; the predetermined part being a subcutaneous and the skeletal muscle being a semitendinosus muscle;

an anesthesia step of anesthetizing the experimental
5 animal by inhalation anesthesia;

a measurement electrode placement step of placing a measurement electrode (24) in the semitendinosus muscle of the anesthetized experimental animal;

a punctuation step of puncturing an injection needle
10 (18) into the plantar subcutaneous of the anesthetized experimental animal while measuring a myoelectric potential of the semitendinosus muscle by the measurement electrode (24);

an administration step of starting administering a drug
15 solution to the plantar subcutaneous of the anesthetized experimental animal through the injection needle (18) after a lapse of one second or more has elapsed from when a myoelectric response caused by the punctuation of the injection needle (18) disappears; and

20 a separate measurement step of the myoelectric response caused by the punctuation, by performing at least one of measurement of an EMG intensity obtained by integrating absolute values of the myoelectric potential from occurrence to disappearance of the myoelectric response
25 caused by the administration of the drug solution and

measurement of a duration time of the myoelectric response caused by the administration of the drug solution,

wherein the punctuation step, the administration step, and the measurement step are performed for each of a

5 plurality of drug solutions having different compositions or for each of a plurality of administration conditions,

the method further comprising a identifying step of identifying a drug solution composition with which the duration time is shortest or the EMG intensity is smallest,

10 among the plurality of drug solutions having different compositions, or identifying an administration condition with which the duration time is shortest or the EMG intensity is smallest, among the plurality of administration conditions.

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