Conditioned pain modulation (CPM): experimental studies in the craniofacial region in healthy humans

By

Yuka Oono

Abstract

Chronic craniofacial musculoskeletal pain conditions such as temporomandibular disorders (TMD) are associated with alternations in pain-modulatory processes reflected in conditioned pain modulation (CPM). Recent research suggests that the evaluation of CPM may identify patients at risk of developing chronic pain. For further application of CPM as a diagnostic tool or for screening of analgesic compounds, the test-retest reliability and inter-individual variation in CPM need to be studied.

The aims of this Ph.D. project were to systematically investigate if the CPM is intensity, assessment site (segmental: craniofacial region / extrasegmental: spinal region) and gender dependent in the craniofacial region (Study I); if an ongoing experimental temporomandibular joint (TMJ) pain influences the CPM evoked by standardized mechanical craniofacial pain (Study II), and to evaluate the inter- and intra-individual variation in CPM evoked by the different stimulus modalities (Study III).

Study I showed for the first time that the CPM effect in the craniofacial region (evoked by mechanical stimulation) is intensity dependent but not assessment site (segmental: craniofacial region / extrasegmental: spinal region) or gender dependent. Study II indicated that acute experimental TMJ pain does not alter the magnitude of the CPM effects in either gender, suggesting that deficiencies in CPM in persistent pain conditions are most likely more related to the duration of clinical pain than the pain per se. In addition, Study III showed that the cold pressor pain (CPP) evokes the largest CPM responses and leads to the smallest inter- and intra-individual variation. The leg as the assessment site results in the largest CPM responses. These results implicate that the CPP is the most efficient conditioning stimulus to induce CPM when assessed by pressure pain thresholds. In conclusion, the present work on CPM has provided new information on the pain modulation system. The results might be helpful to improve the knowledge of assessment, diagnosis and treatment of TMD and other craniofacial pain disorders.
To fulfill the requirements for the Ph.D. degree, Ms Yuka Oono has submitted the thesis: Conditioned pain modulation (CPM): experimental studies in the craniofacial region in healthy humans to the Faculty Council of Medicine at Aalborg University.

The Faculty Council has appointed the following adjudication committee to evaluate the thesis and the associated lecture:

*Associate Professor Hikaru Kohase*
Tokyo Medical and Dental University
Japan

*Associate Professor Dorit Pud*
University of Haifa
Israel

Chairman:
Associate Professor Parisa Gazerani
Center for Sensory-Motor Interaction
Denmark

Moderator:
Associate Professor Mark de Zee
Center for Sensory-Motor Interaction
Denmark

The Ph.D. lecture is public and will take place on:

**Friday 2 December 2011**
Aalborg University – Room D2-106
Fredrik Bajers Vej 7 D-2
9220 Aalborg East

Programme for Ph.D. Lecture on

**Friday 2 December 2011**

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**Chairman:** Associate Professor Parisa Gazerani

**Moderator:** Associate Professor Mark de Zee

13.00 Opening by the Moderator

13.05 PhD lecture by Yuka Oono

13.50 Break

14.00 Questions and comments from the Committee

Questions and comments from the audience at the Moderator’s discretion

16.00 (No later than)

Conclusion of the session by the Moderator

After the session a reception will be arranged