

## Press release

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### Basic information

Name: Malin Erika Overlade Carmland      Email: [malin.carmland@clin.au.dk](mailto:malin.carmland@clin.au.dk) Phone: 784 63380

Department of: Clinical Medicine

Main supervisor: Nanna Brix Finnerup

Title of dissertation: Precision medicine in peripheral neuropathic pain

Date for defence: July 5 at (time of day): 13.00 Place: Auditorium J116-113, Entrance J, Aarhus University Hospital, Palle Juul-Jensens Boulevard 165, 8200 Aarhus N

Press release (Danish)

Præcisions medicin ved perifer nervesmerte

Nervesmerter er hyppigt og vanskeligt at behandle. Nervesmerte skyldes sygdom eller skade i det somatosensoriske nervesystem, enten centralt eller perifert. Nuværende behandlings rekommandationer er generelle og skelner ikke mellem type af nervesmerter eller drivende smertemekanisme. Et nyt ph.d-projekt fra Dansk Smerteforskningscenter, Institut for Klinisk Medicin, Aarhus Universitet og Neurologisk Afdeling, Aarhus Universitetshospital, har undersøgt konceptet præcisionsmedicin i forbindelse med behandling af perifere nervesmerter. I to randomiserede placebo-kontrollerede studier undersøgte vi hvad der prædikterer effekten af to præparater som virker på to forskellige veje i smerte signalering. Hypoteserne var, at sensorisk fænotype prædikterer effekten af en natrium kanal blokkere, imens evnen til at engagere inhibitoriske smerteveje prædikterer effekten af en noradrenalin dopamin reuptake hæmmer. Sensorisk fænotype, prædikterede ikke effekten af en natriumkanal blokker som vist i et tidligere studie. Evnen til at engagere inhibitoriske smerteveje prædikterede heller ikke effekten af en noradrenalin- og dopamin reuptake hæmmer. Resultaterne var dog begrænsede af manglende styrke og de metoder som blev brugt som surrogat for smertemekanisme. Nogle patienter havde dog en god effekt af disse præparater, og det vil derfor være interessant at undersøge andre prædiktorer, for eksempel genetik. Derudover analyseredes sensoriske tegn på hyperpati, og vi fandt at dette syndrom formentlig er sjældent i kronisk perifer nervesmerte.

Projektet er gennemført af læge Malin Erika Overlade Carmland der forsvare det d. 5/7 2024.

Forsvaret er offentligt og finder sted den 5/7 kl. 13.00 i auditorium J116-113, entrance J, Aarhus Universitets Hospital, Palle Juul-Jensen Boulevard 165, 8200 Aarhus N Vejnavn, By. Titlen på projektet er "Precision medicine in peripheral neuropathic pain". For yderligere oplysninger kontakt venligst Ph.d.-studerende Malin Erika Overlade Carmland, e-mail: [malin.carmland@gm](mailto:malin.carmland@gm).

Bedømmelsesudvalg:

Therese Juul, Associate professor, MD. Department of Clinical Medicine, Department of Surgical Gastroenterology, Aarhus University Denmark

Philipp Hüllemann, Professor. Division of Pain Research and Therapy, Department of Neurology, University Hospital Kiel, Schleswig-Holstein, Kiel, Germany

Niels Eiskjær, Professor. Steno Diabetes Center North Denmark, Departments of Endocrinology & Clinical Medicine, Aalborg University Hospital, Denmark

Press release (English)

## "Precision medicine in peripheral neuropathic pain"

Neuropathic pain (NP) is common and difficult to treat. NP is due to a lesion or disease of the somatosensory system, either centrally or peripherally. Current treatment guidelines are general and do not distinguish between types of NP or specific pain mechanisms.

A new PhD project from the Danish Pain Research Center, Department of Clinical Medicine, Aarhus University and Department of Neurology, Aarhus University Hospital, has explored the concept of precision medicine in the treatment of peripheral NP. In two randomized placebo controlled trials, we examined predictors of response to two drugs acting on different pathways involved in pain. The hypotheses were that sensory phenotype would predict response to the sodium channel blocker lacosamide and that ability to engage inhibitory pain pathways would predict response to the noradrenalin dopamine reuptake inhibitor bupropion. We used quantitative sensory phenotyping and conditioned pain modulation as surrogates for driving pain mechanism, respectively. Sensory phenotype, as defined by quantitative sensory testing did not predict response to lacosamide. Neither did the efficiency of conditioned pain modulation predict response to bupropion. These results may be impacted by lack of power and limitations of the surrogates used. There were, however, subgroups of patients who responded well to these drugs. It would be of interest to examine other predictors, such as genetics.

Further, we analysed sensory signs of hyperpathia, a poorly defined syndrome, and found that it is probably a rare phenomenon in chronic peripheral NP.

The project was carried out by Malin Erika Overlade Carmland, who is defending her dissertation on July 5, 2024.

The defence is public and takes place on July 5 at 1:00 pm in auditorium J116-113, Palle Juul-Jensens Boulevard 165, Aarhus University Hospital. The title of the project is "precision medicine in peripheral neuropathic pain". For more information, please contact PhD student Malin Carmland, email: malin.carmland@clin.au.dk

Assessment committee:

Therese Juul, Associate Professor. Department of Clinical Medicine, Department of Surgical Gastroenterology, Aarhus University Denmark

Philipp Hüllemann, Professor. Division of Pain Research and Therapy, Department of Neurology, University Hospital Kiel, Schleswig-Holstein, Kiel, Germany

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