INVITATION – PHD DEFENCE

VINNI FABER RASMUSSEN, MD

"Large fiber, small fiber, and autonomic neuropathy in adolescents with type 1 diabetes"

Friday March 8, 2024, at 14.00

In Auditorium Verdensrummet (A201-170), Entrance A, Steno Diabetes Center Aarhus, Aarhus University Hospital, Palle Juul-Jensens Boulevard 165, 8200 Aarhus N

The defence is public, in English and expected to last 2 hours.
After the defence, The Steno Diabetes Center and The Danish Pain Research Center will host a reception.

Assessment committee

- Associate Professor Birger Johnsen (chairman and moderator of the defence)
  Department of Clinical Neurophysiology, Department of Clinical Medicine, Aarhus University, Denmark
- Professor Vincenza Spallone
  Department of Systems Medicine, Endocrinology, University of Rome Tor Vergata, Rome, Italy
- Professor Jesper Johannesen
  Department of Clinical Medicine, Copenhagen University & Department of Paediatrics, Copenhagen University Hospital, Herlev and Gentofte & Steno Diabetes Center Copenhagen (SDCC) Denmark

Supervisors

- Professor Astrid Juhl Terkelsen (Main Supervisor)
  The Danish Pain Research Center, Department of Clinical Medicine, Aarhus University & Department of Neurology, Aarhus University Hospital.
- Associate Professor Esben Thyssen Vestergaard
  Department of Pediatrics and Adolescents and Steno Diabetes Center Aarhus (SDCA), Aarhus University Hospital, and Department of Clinical Medicine, Aarhus University
- Associate Professor Kurt Kristensen
  Steno Diabetes Center Aarhus (SDCA) and Department of Pediatrics and Adolescents, Aarhus University Hospital, and Department of Clinical Medicine, Aarhus University
- Professor Jens Randel Nyengaard
  Core Centre for Molecular Morphology, Section for Stereology and Microscopy, Department of Clinical Medicine, Aarhus University & Department of Pathology, Aarhus University Hospital

AARHUS UNIVERSITY
HEALTH – DEPARTMENT OF CLINICAL MEDICINE
Danish Pain Research Center

PRESS RELEASE

Vinni Faber Rasmussen, MD, from The Danish Pain Research Center, Department of Clinical Medicine, and Steno Diabetes Center Aarhus, will defend her PhD thesis titled "Large fiber, small fiber, and autonomic neuropathy in adolescents with type 1 diabetes" at 14.00 on March 8, 2024. The defence is in English and will last approximately 2 hours.

Neuropathy is a well-known complication of diabetes, however, the prevalence of neuropathy among adolescents with type 1 diabetes (T1D) is less well investigated, and in Denmark, the screening for neuropathy is limited. In this PhD project, Vinni has investigated large fiber, small fiber, and autonomic neuropathy in adolescents with T1D by systematically reviewing the literature and conducting a clinical study, revealing that Danish adolescents with T1D are not exempt from having neuropathy.

In the cross-sectional study, 60 adolescents with T1D were examined using confirmatory diagnostic methods and various available screening tests. The project has demonstrated that several adolescents with T1D already exhibit functional and/or structural nerve damage. During the performance of nerve conduction studies, it was observed that 40% exhibited measurable functional changes in the large nerve fibers essential for function such as touch and vibration sensation, while 27% had reduced intraepidermal nerve fiber density.

Additionally, the study explored autonomic nerves associated with the cardiovascular system, gastrointestinal tract, and sweat glands. Autonomic dysfunction was observed in 8-20% of adolescents with T1D. Objective signs of gastrointestinal neuropathy were found, and a new 3D quantification method showed reduced nerve density in sweat glands among those with T1D compared to healthy control subjects.

We must do everything to prevent the development of nerve damage in adolescents with T1D, so they do not end up with a life marked by debilitating symptoms with an increased risk of amputation, cardiovascular events, and early death. This PhD project has additionally investigated the quality of newer available screening methods and potential risk factors for neuropathy, aiming to contribute to the optimization of current detection and prevention efforts against diabetic neuropathy in the pediatric population.

The defence is public and takes place on March 8, 2024, at 14.00 in Auditorium "Verdensrummet" (A201-170), Entrance A, Steno Diabetes Center Aarhus, Aarhus University Hospital, Palle Juul-Jensens Boulevard 165, 8200 Aarhus N

The title of the project is "Large fiber, small fiber, and autonomic neuropathy in adolescents with type 1 diabetes". For more information, please contact PhD student Vinni Faber Rasmussen. E-mail: vfr@clin.au.dk

PRESSEMEDDELELSE

Ph.d.-forsvar, Vinni Faber Rasmussen læge, fra Dansk Smerteforskningscenter, Institut for Klinisk Medicin, og Steno Diabetes Center Aarhus, vil forsvare sin ph.d.-afhandling med titlen "Storfiber, småfiber og autonom neuropati hos unge med type 1 diabetes" den 8. marts 2024 kl. 14.00. Forsvaret er på engelsk og vil cirka vare 2 timer.

Nervebetændelse, kaldet neuropati, er en velkendt komplikation til diabetes, men imidlertid er forekomsten af neuropati blandt unge med type 1 diabetes (T1D) dårlig belyst, og i Danmark screenes kun begrænset for det. Vinni har i dette ph.d.-projekt undersøgt forekomsten af storfiber, småfiber og autonom neuropati hos unge med T1D ved systematisk at gennemgå litteraturen og udføre et klinisk tværsnitsstudie. Resultaterne er bekymrende og viser, at unge med T1D kan have neuropati.

I alt er 60 unge med T1D blevet undersøgt med anerkendte diagnostiske metoder samt en vifte af tilgængelige screeningstests. Projektet har vist, at flere af de unge med T1D allerede har målbare funktionelle og/eller strukturelle nerveforandringer. Nerveledningsundersøgelserne viste, at 40% havde målbare skader på de store nervefibre, som er afgørende for at vi fx kan føle berøring og vibration, og 27% havde nedsat nervetæthed af de små nervefibre i overhuden. Derudover har ph.d.-projektet testet de autonome nerver til henholdsvis det kardiovaskulære system, mavetarmkanalen og svedkirtlerne. Autonom dysfunktion blev påvist hos 8-20%, tegn på neuropati i mavetarmkanalen var også fundet til stede, og en nyere 3D kvantificeringsmetode fandt nedsat nervetæthed i svedkirtlerne hos de unge med T1D sammenlignet med raske kontroller.

Det er vigtigt, at vi gør alt for at forhindre udviklingen af nerveskader hos de unge med T1D, så de ikke ender med et liv med invaliderende symptomer og en øget risiko for amputationer, kardiovaskulær sygdom og tidlig død. Ph.d.-projektet har derfor yderligere testet kvaliteten af nyere tilgængelige screeningsmetoder samt mulige risikofaktorer for neuropati. Dette med henblik på at kunne bidrage med ny viden til, hvordan vi kan optimere vores nuværende screening og forebyggelsesindsats mod neuropati blandt børn og unge med T1D.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 8. marts 2024 kl. 14.00 i auditoriet "Verdensrummet" (A201-170), indgang A, Steno Diabetes Center Aarhus, Aarhus Universitets Hospital, Palle Juul-Jensens Boulevard 165, 8200 Aarhus N

Titlen på projektet er "Storfiber, småfiber og autonom neuropati hos unge med type 1 diabetes".

For yderligere oplysninger kan ph.d.-studerende Vinni Faber Rasmussen kontaktes på mail: vfr@clin.au.dk