AARHUS UNIVERSITY

Press release

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Basic information

Name: Kousik Sarathy Sridharan Email: kssi@clin.au.dk Phone: 8192 0848

Department of: Clinical Medicine

Main supervisor: Prof. Karen Østergaard

Title of dissertation: "Neuromagnetic investigations of mechanisms and effects of STN-DBS and medication in Parkinson's disease"

Date for defence: 28-09-2017 at (time of day): 10.00 A.M. Place: Pathology auditorium, Aarhus University

Press release (Danish)

Både dyb hjernestimulation (DBS) og dopaminerg medicin afhjælper Parkinsons sygdoms-symptomer, men gennem forskellige mekanismer

Dyb hjernestimulation (DBS) og dopaminerg medicin er begge behandlingsformer der afhjælper bevægelsessymptomer ved Parkinsons sygdom (PS), men de udøver deres virkning på PS-patienters hjerner på forskellig vis. Det er konklusionen på et nyt ph.d.-projekt fra Aarhus Universitet, Health. Projektet er gennemført af Kousik Sarathy Sridharan, der forsvarer det d. 28/9.

DBS er en behandlingsform som kan afhjælpe bevægelsessymptomerne i Parkinsons sygdom (PS) når dopaminerg medicin ikke længere kan undertrykke symptomerne tilfredsstillende. Selvom det gennem mange studier er blevet vist at DBS effektivt undertrykker PS-symptomer, er vores forståelse af selve effekt-mekanismen bag DBS stadig mangelfuld, hvilket hindrer fremskridt inden for forbedring af behandlingsresultaterne samt reducering af bivirkninger.
For at fremme vores forståelse af disse aspekter benyttede gruppen omkring ph.d.-projektet magnetoencefalografi (MEG) til at undersøge hjerneaktiviteten ved hvile, bevægelse og påvirkning af følesansen hos PS-patienter og raske kontroller. Disse målinger blev udført hos PS-patienterne i DBS-behandlet tilstand, i ubehandlet tilstand (hverken med DBS eller medicin) og i en tilstand behandlet med dopaminerg medicin.
På baggrund af resultaterne fra de tre studier udleder gruppen bag projektet først og fremmest at DBS og dopaminerg medicin benytter delvist forskellige funktionelt-anatomiske forbindelser og mekanismer i deres bedring af PS-symptomerne. Derudover fremsætter de at de to behandlingsformer påvirker den oscillatoriske (rytmiske) hjerneaktivitet i kortex og de subkortikale strukturer forskelligt, og at dette sker gennem mere sofistikerede mekanismer end blot en undertrykkelse af den uhensigtsmæssige aktivitet i et bestemt frekvensbånd. Endelig opfordrer gruppen på denne baggrund til at der i udforskningen af effekt-mekanismerne bag PS-behandlingsformerne ses ud over blot bevægelsessymptomerne (fx til PS-patienternes problemer med følesansen) for at bane vej for et mere integreret syn på behandlingernes virkninger og dermed også bedre behandling af sygdommen.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 28/9 kl. 10.00 i Patologisk auditorium, Aarhus Universitetshospital, Bygning 18, Nørrebrogade 44, 8000 Aarhus C. Titlen på projektet er "Neuromagnetiske undersøgelser af mekanismer bag og virkning af STN-DBS og medicin i Parkinsons sygdom". Yderligere oplysninger: Ph.d.-studerende Kousik Sarathy Sridharan, e-mail: kssi@clin.au.dk, tlf. +45 8192 0848.

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Press release (English)
PhD defence: Kousik Sarathy Sridharan

Both deep brain stimulation (DBS) and dopamingeric medication alleviate Parkinson's disease symptoms, but through different effect mechanisms

Deep brain stimulation (DBS) and dopaminergic medication are both treatment regimes that alleviate the movement-related symptoms of Parkinson's disease (PD), but they do so by affecting the PD patients' brains differently. This is the conclusion of a new PhD project from Aarhus University, Health. The project has been lead by Kousik Sarathy Sridharan who will defend it on 28th September.

DBS is a therapeutic recourse undertaken to treat motor symptoms in Parkinson's disease (PD) when dopaminergic medication is no longer able to suppress symptoms adequately. Though DBS has been empirically shown to be effective in treating PD symptoms, the effect-mechanisms are still not well understood, which is hindering progress in improving treatment outcomes and reducing side-effects. To further our understanding of these aspects, the group behind the project used magnetoencephalograhy (MEG) to study oscillatory dynamics at rest, during movement and during somatosensory processing in PD patients and healthy controls. These measurements were conducted in DBS-treated, untreated (DBS-washout) and dopaminergic-medicated states in the PD patients. Based on the results of the three studies, the group firstly infers that DBS and dopaminergic medication employ partially different anatomo-functional pathways and functional strategies when improving PD symptoms. Secondly, they suggest that treatments act on pathological oscillatory dynamics differently at cortical and sub-cortical levels and may do so through more sophisticated mechanisms than mere suppression of the pathological spectral power in a particular band. And thirdly, they urge exploring the effect mechanisms of PD treatments beyond the motor system (e.g. for sensory function) to allow for a more integrated view on mechanisms of treatments, which could pave the way for better disease management paradigms.

The defence takes place on 28th September 2017 at 10.00 AM at the Pathology auditorium, Aarhus University Hospital, Building 18, Nørrebrogade 44, Aarhus, Denmark.

For more information, please contact PhD student Kousik Sarathy Sridharan, email: kssi@clin.au.dk, Phone +45 8192 0848.

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