

Dansk Neurologisk Selskabs  
**ÅRSMØDE**

fredag den 27. marts - lørdag den 28. marts 2009



**Munkebjerg**  
Munkebjergvej 125  
7100 Vejle



## SHARING your expertise



**Dysport, pulver til injektionsvæske, opløsning (clostridiumbotulinum type A toxin 500 enh.)\***  
Nedenstående produktinformation er uddrag af det godkendte produktresumé for Dysport, som kan rekvireres vederlagsfrit fra Institut Produkt Synthese (IPSEN) AB. **Indikationer:** Spasticitet i armen hos voksne patienter som følge af slagtilfælde. Blefarospasme hos voksne. Spasmodisk torticollis hos voksne. Persisterende svær primær aksillær hyperhidrose, der interfererer med daglige gøremål og som ikke responderer på topiske behandlingsmidler. **Dosering:** Alle de angivne enheder af botulinumtoxin gælder kun for Dysport og kanikke overføres på andre botulinumtoxinpræparater. Spasticitet i armen hos voksne patienter som følge af slagtilfælde Den anbefalede dosis er 1000 enheder fordelt på de følgende fem muskler: flexor digitorum profundus (FDP), flexor digitorum superficialis (FDS), flexor carpi ulnaris (FCU), flexor carpi radialis (FCR) og biceps brachii (BB). Blefarospasme: Til voksne og ældre anbefales 120 E pr. øje ved dobbeltsidig blefarospasme. Virkningen forventes at indtræde inden for 2 - 4 dage med maksimal effekt inden for 2 uger. I tilfælde af ensidig blefarospasme begrænses injektionerne til det angrebne øje. Spasmodisk torticollis: Til voksne og ældre normalvægtige uden tegn på lav muskelmasse i halsregionen initialdosis 500 E givet som en delt dosis - injiceret i de 2 eller 3 mest aktive halsmuskler. Injektionerne gentages ca. hver 12. uge eller efter behov for at undgå symptomerne genopstår. Aksillær hyperhidrosis: Initialdosis til voksne og ældre er 100 E per armhule med intradermalinjektion ti steder, 10 Enheder hvert sted. Der kan dog gives op til 200 E per armhule ved efterfølgende injektioner, hvis ønsket effekt ikke er opnået. Der må ikke behandles oftere end hver 12. uge, og der er tegn på kumulativ effekt ved gentagne doser. **Kontraindikationer:** Dysport er kontraindiceret til patienter med kendt overfølsomhed over for det aktive stof eller over for et eller flere af hjælpestofferne. **Særlige advarsler og forsigtighedsregler:** Dysport bør administreres med forsigtighed til patienter med synke- eller vejrtrækningsproblemer, da disse problemer kan forværes, hvis toxinet spredes til omkringliggende muskler. I sjældne tilfælde er aspiration forekommet. Aspiration er en risiko ved behandling af patienter med spasmodisk torticollis, som har en kronisk respiratorisk sygdom. Der er imidlertid sjældne tilfælde rapporteret dødsfald, i forbindelse med dysphagia, pneumopati og/eller hos patienter med signifikant asteni, efter behandling med botulinumtoksin A eller B. Patienter med lidelser, som resulterer i defekt neuromuskulær transmission eller vanskeligheder med at synke eller ånde, har større risiko for at opleve disse bivirkninger. Hos disse patienter må botulinumtoksin kun indgives under speciallægekontrol og kun hvis fordelene ved behandlingen opvejer risikoen. Patienter og deres plejere skal advares om nødvendigheden af øjeblikkelig medicinsk behandling, hvis patienten får problemer med at synke, tale eller trække vejret. Dysport skal anvendes med forsigtighed og under nøje overvågning til patienter med subklinisk og tidligere

## **Dysport®** **Botulinum Toxin Type A**

kraftig forringet neuromuskulær transmission (f.eks. Myasthenia Gravis). Der er noteret sjældne tilfælde af antistofdannelse mod botulinumtoxin hos patienter, der får Dysport. Dette præparat indeholder en lille mængde humant albumin. Risikoen for overførsel af infektion kan ikke med sikkerhed udelukkes, idet der er anvendt humant blod eller blodprodukter. **Interaktioner:** Lægemidler, som påvirker den neuromuskulære transmission f.eks. aminoglykosider bør anvendes med forsigtighed. **Bivirkninger:** Følgende bivirkninger er rapporteret hos patienter behandlet med Dysport. Hyppigheden defineret således: Meget almindelig (>1/10), almindelig (>1/100 og <1/10), ikke almindelig (>1/1000 og <1/100), sjælden (>1/10.000 og <1/1000). Alle bivirkninger er milde og forbigående. Generelle (blefarospasme, hemifaciale spasmer, torticollis): Almindelig: generel svaghed, træthed, influenzalignende symptomer, smerte/blå mærke på injektionsstedet. Ikke almindeligt: kløe. Sjælden: neuralgisk amyotrofi, hududslæt. Patienter behandlet for spasmodisk torticollis har rapporteret følgende bivirkninger: Meget almindelig: dysfagi (dosis-afhængig og forekommer hyppigst efter injektion i sternomastoid-musklen. En mild diæt kan være nødvendig indtil symptomerne er gået over). Almindelig: dysfoni, svaghed af nakkemuskler. Ikke almindelig: hovedpine, dobbeltsyn, sløret syn, mundtørhed. Sjælden: respiratoriske sygdomme. Patienter behandlet for blefarospasme og hemifaciale spasmer: Meget almindelig: ptosis. Almindelig: svaghed af ansigtsmuskler, dobbeltsyn, tørre øjne, tåreflåd, øjenlågsodem. Ikke almindelig: lammelse af ansigtsnerven, ophthalmoplegi. Sjælden: entropion. Bivirkningerne kan skyldes midlertidig lammelse af andre nærvedliggende muskelgrupper på grund af dybe eller forkert placerede Dysport injektioner. Bivirkningsprofilen efter markedsføringen reflekterer produktets farmakologiske profil set i de kliniske studier. Aksillær hyperhidrosis: Almindelig: dyspnø, kompensatorisk hyperhidrosis, smerte i skulder, øvre arm og nakke, myalgi i skulder og læg. Ikke almindelig: svimmelhed, hovedpine og paræstesi, ufrivillig muskelkrampe i øjenlåg, rødmen, næseblod, øget svedafsøndring på andre hudpartier. Sjælden: allergiske reaktioner, såsom hududslæt. Der er i meget sjældne tilfælde rapporteret om bivirkninger, som er et resultat af distribution af toksinets virkning til steder fjernt fra administrationsstedet (usædvanlig stor muskelsvaghed, dysphagia, aspirationspneumoni, som kan være fatal). De fleste bivirkninger er milde og forbigående. **Registreringsindehaver:** Institut Produkt Synthese (IPSEN) AB, Färögatan 33, SE-164 51 Kista, Sverige. MT nr.: 14586. **Udlevering:** Må kun udleveres til sygehuse, eller efter ordination af speciallæger i oftalmologi, neurologi, plastikkirurgi og dermatovenerologi. **Lægemiddelform:** Pulver til injektionsvæske, opløsning i hætteglaså 500 enheder Clostridium botulinum type A toxin. **Priser og pakninger:** 2 x 500 IE 5382, 55 kr. (25. februar 2009). For dagaktuelle priser se venligst [www.medicinpriser.dk](http://www.medicinpriser.dk). **Tilskudsregler:** Ikke tilskudsberettiget, 9. februar 2009

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# Program/tidsplan til DNS' årsmøde den 27.-28. marts 2009 på Hotel Munkebjerg, Vejle

## Fredag den 27. marts

- 10.15-10.45 **Kaffe + udstilling**
- 10.45-10.50 **Velkomst**  
v/ Formand Olaf B. Paulson
- 10.50-11.35 **Session I – Professorforelæsning**  
*Modern acute stroke therapy:  
intravenous thrombolysis and beyond*  
v/ Professor Derk W. Krieger, Neurologisk Afdeling, Bispebjerg  
Hospital og Neurologisk Klinik, Rigshospitalet
- 11.35-11.40 Strække ben-pause
- 11.40-13.10 **Session II – Mogens Fog Foredragskonkurrence**
- 13.10-14.10 Frokost + Udstilling
- 14.10-14.50 **Session III – Årets tre cases fra den neurologiske raritetskasse**  
*Interaktiv session med fremvisning af patienter på DVD*  
Sessionen i 2009 tilrettelægges af Neurologisk Afdeling,  
Aalborg Sygehus
- 14.50-14.55 Strække ben pause
- 14.55-15.30 **Session IV – Hvad sker der med patienter på subspecial-  
afdelingen?**  
*Behandlings- og forskningsmæssige aspekter illustreret ved cases*  
v/ Overlæge, dr.med., ph.d. Lars Bendtsen fortæller om Hoved-  
pineklinikken på Glostrup Hospital
- 15.30-16.30 **Postersession**  
+ kaffe og udstilling
- 16.30-18.00 **Session V – Neurobowl**  
v/ Overlæge, dr. med. Klaus Hansen, Neurologisk Klinik,  
Rigshospitalet
- 18.00-19.00 Pause
- 19.00-02.00 **Festmiddag**  
Underholdningen arrangeres af YN  
Årets udannelsesprismodtager kåres  
Vinderen af Mogens Fog Foredragskonkurrence kåres  
Årets posterpris udnævnes

## Lørdag den 28. marts

### 09.00-09.55 **Session VI a – Frontline topic**

09.00-09.40 *An epidemiologic view of the etiology of multiple sclerosis*  
v/ Professor John F. Kurtzke, Neuroepidemiology Section, Neurology Service, Veterans Affairs Medical Center, Washington, DC; and Department of Neurology, Georgetown University School of Medicine, Washington DC

09.40-09.55 *Changes in MS epidemiology in Denmark*  
v/ Overlæge, dr.med. Nils Koch-Henriksen, Neurologisk Afdeling, Aalborg

09.55-10.05 Strække ben-pause

### 10.05-10.40 **Session VI b – Frontline topic (fortsat)**

10.05-10.20 *Current opinion on MS immunology*  
v/ Overlæge, dr. med. Finn Sellebjerg, Neurologisk Klinik, Rigshospitalet

10.20-10.40 *New and emergent therapy in MS*  
v/ Professor, overlæge, dr.med. Per Soelberg Sørensen, Neurologisk Klinik, Rigshospitalet

10.40-11.10 Kaffepause og udstilling

### 11.10-11.55 **Session VII – Den nye målbeskrivelse for hoveduddannelse i neurologi**

v/ Afdelingslæge, ph.d. Steffen Birk, Neurofysiologisk Klinik, Rigshospitalet, Overlæge, dr.med. Rigshospitalet, Susanne Helweg-Larsen og Reservelæge, Neurologisk Afd. Odense, Henrik Boye Jensen

### 11.55-12.45 **Session VIII – Pro et contra: rutinemæssig genetisk screening ved neurologiske lidelser**

v/ Overlæge, dr.med. Jørgen Nielsen, Neurocentret, Rigshospitalet, og Professor, dr.med. Thomas G. Jensen, Kennedy Centret, og medlem af Det Ethiske Råd.

Jørgen Nielsen taler for genetisk udredning ved neurologiske lidelser; Thomas G. Jensen taler imod

12.45- Afskedssandwich eller let anretning

# Mogens Fog Foredragskonkurrence 2009

Chairman: Professor, overlæge, dr.med. Per Soelberg Sørensen

- 1. Familial hemiplegic migraine**  
Jakob Møller Hansen
- 2. Rehabilitation of gait in hemiplegic stroke survivors: a randomized clinical trial**  
K. Severinsen, J. Jakobsen, K. Overgaard, H. Andersen
- 3. Accelerated muscular atrophy in diabetic polyneuropathy: a long-term follow-up study**  
Christer Swan Andreassen
- 4. Fatigued patients with multiple sclerosis have impaired central muscle activation**  
Anne Katrine Andreasen, Johannes Jakobsen, Thor Petersen, Henning Andersen
- 5. High-dose IVIg infusion induces a substantial suppression of NK cells in CIDP patients**  
Thomas Harbo, Anja Bille Bohn, Line Petersen, Anni Skovbo, Jan Krog, Thomas Vorup-Jensen, Marianne E. Hokland
- 6. Primary progressive multiple sclerosis is associated with less inflammation and more remyelination in the brain**  
Stephan Bramow, Henning Laursen, Hans Lassmann, Nils Koch-Henriksen, Per Soelberg Sørensen
- 7. Mutation hunting in hereditary spastic paraplegia**  
Kirsten Svenstrup, Peter Bross, Pernille Koefoed, Lena E. Hjermand, Hans Eiberg, A. Peter Born, John Vissing, Jesper Gyllenborg, Anne Nørremølle, Lis Hasholt, Jørgen E. Nielsen
- 8. Resistance training improves muscle strength and functional capacity in relapsing-remitting multiple sclerosis – a randomised controlled trial**  
U. Dalgas, E. Stenager, J. Jakobsen, T. Petersen, H.J. Hansen, C. Knudsen, K. Overgaard, T. Ingemann-Hansen
- 9.  $\alpha$ -synuclein gene dosage study in individuals with parkinsonian syndromes and other neurodegenerative disorders**  
S. Bech, A. Nørremølle, K. Svenstrup, K. Winge, J.E. Nielsen, L.E. Hjermand
- 10. PACAP38 induces migraine-like attacks in patients with migraine without aura**  
Henrik Winther Schyzt, Steffen Birk, Troels Wienecke, Christina Kruuse, Jes Olesen, Messoud Ashina

## Familial hemiplegic migraine

*Jakob Møller Hansen*

### **Background and aims**

Familial hemiplegic migraine (FHM) is a dominantly inherited subtype of migraine with aura and transient hemiplegia associated with several mutations in genes coding for neuronal ion channels. These mutations lead to neuronal hyperexcitability and decreased threshold for cortical spreading depression in transgenic animal models.

FHM and the common forms of migraine are thought to belong to a spectrum of migraine phenotypes with similar pathophysiology. The common forms of migraine are characterised interictally by a habituation deficit of cortical and subcortical evoked responses, which has been attributed to neuronal dysexcitability. We therefore tested the hypothesis that a similar abnormal habituation pattern would be found in FHM patients.

### **Methods**

We included 9 FHM patients with known gene mutations and 7 healthy controls.

We recorded: Habituation of visual evoked potentials (VEP), auditory evoked potentials including intensity dependence (IDAP) and the nociception-specific blink reflex (nsBR).

### **Results**

FHM patients had a more pronounced habituation during VEP ( $p=0.025$ ) and nsBR recordings ( $p=0.023$ ) than HV. There was no significant difference for IDAP, but the slope tended to be steeper in FHM.

### **Conclusion**

Contrary to the common forms of migraine, FHM patients are not characterized by a deficient, but rather by an increased habituation in cortical/brain stem evoked activities. These results suggest that there may be some striking pathophysiological differences between FHM and the common forms of migraine, as far as central neuronal processing is concerned.

## Rehabilitation of gait in hemiplegic stroke survivors: a randomized clinical trial

*K. Severinsen<sup>1</sup>, J. Jakobsen<sup>1</sup>, K. Overgaard<sup>2</sup>, H. Andersen<sup>1</sup>*

### Objective

To compare the impact of resistance training vs. endurance training on rehabilitation of gait in chronic stroke survivors.

### Methods

42 patients (30 male) with mean age of 67.4 years (50-80) and mean duration since onset of stroke of 18 months (8-38) completed 3 weekly training sessions for 12 weeks. Patients were randomized to endurance training (n=13) resistance training of the lower extremities (n=14) or control intervention (n=15). Evaluation was performed applying isometric dynamometry, 10-meter-walk-test (10mWT), 6-minute-walk-test (6MWT), peak-oxygen consumption ( $\text{VO}_2$ -peak), and clinical and functional testing.

### Results

Knee muscle strength in the resistance group improved from 68 (47-90)% to 87 (65-109)% of expected and from 95 (77-112)% to 118 (102-134)% of expected on the paretic and non paretic side, respectively.  $\text{VO}_2$ -peak in the endurance group improved from 17 (14-20) to 20 (16-23) ml  $\text{O}_2$ /kg/min in the group performing endurance training.

Patients improved 12 (9-16)% on 6MWT and 21 (15-29)% on fast 10mWT but no differences was observed between groups. On habitual 10mWT, however, the resistance group improved with 7 (2-10)% compared with the other groups.

### Conclusions

Chronic stroke survivors benefit from 12 weeks of physical training. Resistance training is superior to endurance training in improving walking speed in stroke survivors.

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1) Dept. of Neurology, Aarhus University Hospital

2) Faculty of Biomechanical Research, Aarhus University

## Accelerated muscular atrophy in diabetic polyneuropathy: a long-term follow-up study

*Christer Swan Andreassen*

### Objective

The aim of the study was to determine the loss of muscle volume in the lower leg and foot in long-term diabetic patients in relation to presence of neuropathy.

### Research design and methods

26 type 1 diabetic patients participating in MRI-studies on muscle volume in the lower leg and foot 9 to 12 years earlier were re-examined using MRI, isokinetic dynamometry, clinical examination, electrophysiological studies, and quantitative sensory examinations.

### Results

Annual loss of muscle volume of ankle dorsal and plantar flexors was 4.5 (5.5-3.9)% and 5.0 (7.0-4.2)% in neuropathic patients, 1.9 (3.2-1)% and 1.8 (2.6-1.3)% in non-neuropathic patients, and 1.7 (2.8-0.8)% and 1.8 (2.4-0.8)% in controls, respectively ( $P < 0.01$ ). Annual change of volume and strength correlated for ankle dorsal flexors ( $r_s = 0.73$ ,  $P < 0.01$ ), and for ankle plantar flexors ( $r_s = 0.63$ ,  $P < 0.05$ ) in diabetic patients. Also, annual change of muscle volume for dorsal and plantar flexors was related to the combined score of all measures of neuropathy ( $r_s = -0.68$ ,  $P < 0.02$  and  $r_s = -0.73$ ,  $P < 0.01$ , respectively). Foot muscle volume declined annually by 3.0 (3.4-1.0)% in neuropathic patients and by 1.1 (4.0-0.2) in non-neuropathic patients, both values significantly different from controls (0.2 (-2.5-2.4)%). Loss of foot muscle volume was related to severity of neuropathy assessed at clinical evaluation ( $r_s = -0.6$ ,  $P < 0.05$ ).

### Conclusions

Muscular atrophy in long-term diabetic neuropathy occurs early in the feet, progresses steadily in the lower legs, relates to severity of neuropathy, and leads to weakness at the ankle.

## Fatigued patients with multiple sclerosis have impaired central muscle activation

*Anne Katrine Andreasen, MD, Johannes Jakobsen, MD, DMSci,  
Thor Petersen, MD, DMSci and Henning Andersen, MD, PhD, DMSci*

The pathogenesis of fatigue in multiple sclerosis (MS) is poorly understood. To elucidate the role of central motor function we hypothesized that patients with primary fatigue have impaired central motor activation and increased fatigability as compared to secondary fatigued and non-fatigued patients. 60 patients with relapsing remitting MS and an Expanded Disability Status Scale score  $\leq 3.5$  were recruited and grouped as fatigued or non-fatigued according to their Fatigue Severity Scale score. Nineteen patients were primary fatigued, 20 secondary fatigued and 21 non-fatigued. Maximal voluntary contraction, central activation and peripheral activation were determined by percutaneous twitch interpolation of the right quadriceps muscle. Maximal voluntary contraction was similar between groups but related to scores of fatigue. Peripheral activation was similar in all groups. Central activation was impaired in both groups of fatigued patients as compared to non-fatigued patients being 0.96 (0.05) in primary fatigue, 0.96(0.04) in secondary fatigue and 0.99(0.1) in non-fatigue ( $P=0.01$ ), the impairment of central motor activation being related to degree of fatigue. During fatiguing exercise there was a similar loss of strength, without any time differences between the three groups. We conclude that impaired central motor activation underlies fatigue in MS and affects both primary- and secondary fatigued patients.

## High-dose IVIg infusion induces a substantial suppression of NK cells in CIDP patients

*Thomas Harbo<sup>1</sup>, Anja Bille Bohn<sup>2</sup>, Line Petersen<sup>2</sup>, Anni Skovbo<sup>2</sup>, Jan Krog<sup>3</sup>, Thomas Vorup-Jensen<sup>4</sup>, Marianne E. Hokland<sup>2</sup>*

High-dose intravenous immunoglobulin (IVIg) is an established treatment for chronic inflammatory demyelinating polyneuropathy (CIDP). Although Fc receptors have been suggested as a target, the pharmacological mode-of-action of IVIg is not well defined. As part of immune effector functions NK cells exert antibody-dependent cell-mediated cytotoxicity (ADCC) through the Fc receptor CD16. We found that these effector functions in CIDP patients decreased markedly following IVIg treatment. This was caused by a decrease in the number of circulating NK cells. In addition, our in vitro experiments suggested a direct influence of IVIg on the function of CD16 through receptor blockage.

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## Primary progressive multiple sclerosis is associated with less inflammation and more remyelination in the brain

*Stephan Bramow, Henning Laursen, Hans Lassmann, Nils Koch-Henriksen, Per Soelberg Sørensen*

### Background

15% of multiple sclerosis (MS) patients have primary progression (PPMS) without relapses from onset. The pathology underlying this course is poorly described.

### Methods

Unselected hemispheric sections from five primary and eight secondary progressive MS (SPMS) patients were cut 4 microns thick and stained with HE, Luxol fast blue-PAS (LFB), and for proteolipid protein (plp, myelin) and CD68 (macrophages/microglia). 12 age-matched controls were also analysed. We measured total and actively demyelinating plaque areas and calculated percentages of total white/deep grey matter. Remyelination, defined as sharply demarcated plaques with uniformly thin myelin, was expressed as percentage of total plaque area. Microglia nodules and foci of active demyelination were counted in non-plaque white matter (NPWM) and remyelinated areas.

### Results

We found higher percentages of active demyelination in SPMS (median 1.32% vs. 0.0%,  $P=0.002$ ), whereas remyelination was more pronounced in PPMS (76.7% vs. 7.2%,  $P=0.006$ ). The median total plaque load was 21.9% in SPMS vs. 5.0% in PPMS,  $P=0.065$ . The densities of microglia nodules and active foci were significantly higher in remyelinated areas than in NPWM. In both area types, we found higher densities of microglia nodules in SPMS vs. PPMS.

### Conclusion

Less inflammation may allow swift and extensive remyelination in PPMS, possibly protecting these patients from relapses.

## Mutation hunting in hereditary spastic paraplegia

*Kirsten Svenstrup, Peter Bross, Pernille Koefoed, Lena E. Hjermand, Hans Eiberg, A. Peter Born, John Vissing, Jesper Gyllenberg, Anne Nørremølle, Lis Hasholt, Jørgen E. Nielsen*

Hereditary spastic paraplegia (HSP) is a clinically and genetically heterogeneous neurodegenerative disorder characterized by progressive spasticity and weakness in the lower limbs. The most common forms of HSP, SPG4 and SPG3A, are caused by mutations in *SPAST* and *SPG3A*, respectively. The phenotype in SPG4 patients can be modified by a rare variant in *SPAST* (p.Ser44Leu) and recently, a rare variant (p.Gly563Gln) in *HSPD1*, the gene underlying SPG13, was reported as a second genetic modifier in SPG4 patients. Screening for mutations in *SPAST* was performed in a cohort of 103 index patients and subsets of these patients were also screened for mutations in *SPG3A* and *HSPD1*. SPG4 patients were genotyped for the modifying variant in *HSPD1*. Disease-causing mutations were found in 16 index patients in *SPAST*, 3 in *SPG3A*, and 1 in *HSPD1*. 6 of the mutations were novel. For 5 additional mutations further molecular genetic investigations were necessary to interpret the effect. A modifying effect of the *HSPD1* (p.Gly563Gln) variant in our cohort of SPG4 patients was not confirmed. Based on these results HSP patients can be offered an improved genetic counselling. The mutation hunt will continue in the patients still negative for an identified disease-causing mutation.

## Resistance training improves muscle strength and functional capacity in relapsing-remitting multiple sclerosis – a randomised controlled trial

*Dalgas U<sup>1,2,3</sup>, Stenager E<sup>2</sup>, Jakobsen J<sup>3</sup>, Petersen T<sup>3</sup>, Hansen HJ<sup>3</sup>, Knudsen C, Overgaard K<sup>1</sup>, & Ingemann-Hansen T<sup>1</sup>*

### Purpose

To test the hypothesis that lower body progressive resistance training (PRT) can improve muscle strength and functional capacity in MS patients, and to evaluate whether the improvements are maintained 12 weeks after the trial.

### Methods

The present study was a two-arm, 12 week randomised controlled trial (RCT) including a post study follow-up period of 12 weeks. 38 MS patients (EDSS; 3-5.5) were randomised to a progressive resistance training group (Exercise, N = 19) or a control group (Control, N=19). The Exercise group completed a bi-weekly 12 week lower body PRT program and was afterwards encouraged to continue training, on their own. The Control group continued their usual daily activity level during the trial period. After the trial the Control group completed the PRT intervention. Both groups were tested before (Pre) and after 12 weeks of trial (Post) and at 24 weeks (Follow-up) where isometric muscle strength of the knee extensors (KE MVC) and functional capacity (FS; score calculated from four functional tests) were evaluated.

### Results

KE MVC and FS improved significantly after 12 weeks of resistance training in the Exercise group (KE: 15.7±20.5%; FS: 21.5±8.3%, P<0.05) and the improvements were significantly better than seen in the Control group (P<0.05). The improvements of KE and FS in the Exercise group persisted at Follow up after 24 weeks. The exercise effects were reproduced in the Control group during the 12 weeks PRT period after the trial.

### Conclusion

Twelve weeks of intense PRT of the lower extremities leads to improvements of muscle strength and functional capacity in moderately impaired MS patients the effects persisting after 12 weeks of self guided physical activity.

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## **$\alpha$ -synuclein gene dosage study in individuals with parkinsonian syndromes and other neurodegenerative disorders**

*S. Bech, A. Nørremølle, K. Svenstrup, K. Winge, J.E. Nielsen, L.E. Hjermand*

### **Objective**

To identify potential  $\alpha$ -synuclein (SNCA) whole gene duplications or triplications in individuals with various parkinsonian syndromes and other neurodegenerative disorders.

### **Background**

Gene dosage aberrations of *SNCA* has been shown to be disease-causing in familial and sporadic cases of parkinsonism with and without associated atypical features. Increased *SNCA* dosage results in overexpression of wild-type  $\alpha$ -synuclein which appears to be toxic in doses above the normal level in neurons. The severity of the phenotype correlates with the *SNCA* gene dosage, hence a duplication results in clinical features indistinguishable from idiopathic Parkinson's disease, whereas triplications tend to produce associated atypical features and result in earlier disease-onset and more rapid progression of disease.

### **Patients and methods**

Patients (N=200) with different parkinsonian syndromes, dystonias, cerebellar ataxias, and dementias with and without a family history were included. Patients with atypical parkinsonism were previously screened for mutations in *MAPT*, *GRN*, *FMR1*, and *SCA1*, 2, 3, 6, and 17. In the patients with dystonia, cerebellar ataxia, and/or dementia, other known genetic causes for these phenotypes had been excluded. The p.G1920S mutation in *LRRK2* was excluded in all patients. *SNCA* gene dosage was determined by one of two methods: 1) quantitative, real-time PCR dosage assay; or 2) multiplex ligand-dependent probe amplification (MLPA) assay.

### **Results**

No *SNCA* duplications or triplications were identified. Aspects of this will be discussed.

## **PACAP38 induces migraine-like attacks in patients with migraine without aura**

*Henrik Winther Schytz, Steffen Birk, Troels Wienecke, Christina Kruuse, Jes Olesen, Messoud Ashina*

Pituitary adenylate cyclase activating peptide-38 (PACAP38) is a strong vasodilator found in trigeminal sensory and parasympathetic perivascular nerve fibers. We hypothesized that infusion of PACAP38 would cause headache in healthy subjects and migraine-like attacks in migraine patients.

12 healthy subjects and 12 migraine patients were examined in two separate studies. All subjects were allocated to receive 10 pmol/kg/min PACAP38 and placebo in a randomized, double-blind crossover study design. Headache was scored on a verbal rating scale during hospital (0-2h) and post-hospital (2-12h) phases. Blood flow velocity in the middle cerebral artery ( $V_{MCA}$ ) by transcranial Doppler and diameter of the superficial temporal artery (STA) by ultrasound were recorded during hospital phase.

PACAP38 infusion caused headache in all healthy subjects and 11 out of 12 migraine patients. Seven migraine patients experienced migraine-like attacks after PACAP38 and none after placebo ( $P=0.016$ ). PACAP38 caused a peak decrease of 16.1% in  $V_{MCA}$  and a 37.5% increase in STA diameter at 20 min after start of infusion.

In conclusion, PACAP38 infusion caused headache and vasodilatation in both healthy subjects and migraine patients. In migraine sufferers, PACAP38 caused delayed migraine-like attacks. The findings stimulate further investigation of the neuronal and vascular mechanisms of PACAP38.

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## Poster session 2009

1. **Acute carotid assessment using duplex**
  2. **Central post-stroke pain**
  3. **Familial hemiplegic migraine** (se side 7)
  4. **Rehabilitation of gait in hemiplegic stroke survivors: a randomized clinical trial**  
(se side 8)
  5. **Fatigued patients with multiple sclerosis have impaired central muscle activation**  
(se side 10)
  6. **PACAP38 induces migraine-like attacks in patients with migraine without aura**  
(se side 16)
- 

### Acute carotid assessment using duplex

*Natalia Solokha, Sverre Rosenbaum, Klaus Hansen, Jens Kjellberg, Derk Krieger*

56 years old man, who recently had diagnosed diabetes, heavily smoker.

The patient was admitted with sudden onset of paresis and sensory disturbances of the right arm, transient dysarthria and pain retrobulbar on the left.

Next day the symptoms were totally remitted. Initial CTC was normal. Duplex of the carotids showed eccentric plaques in the bifurcation. There was also identified a hypoechoic homogeneous clot in the relevant left carotid artery, which suggested an unstable thrombus. The thrombus only had minor hemodynamic influence with a maximal flow velocity of 100 cm/s. Transcranial Doppler of the larger brain vessels were normal.

CT-angio confirmed the ultrasound findings with carotid plaques and the clot. The patient went on heparin. The patient was examined by the vascular surgeons who found indication of subacute surgery despite of the normal flow profile. Histology confirmed unorganized red thrombus.

We find that this case shows that duplex of the carotids in acute stroke should estimate not only the hemodynamic properties of stenosis, but also the stability and composition of the plaques and clots also when they are without any hemodynamic significance – because of treatments consequences.

## Central post-stroke pain

*H. Klit, N.B. Finnerup, K. Overvad, G. Andersen, T.S. Jensen*

### **Background**

Central post-stroke pain (CPSP) may occur in up to 11% of stroke patients. The objective of the study is to assess the prevalence of central pain in post-stroke patients and in a reference group.

### **Method**

A questionnaire about chronic pain was mailed to 964 (F=457, M=507) stroke patients registered in the NIP stroke database in Aarhus County, Denmark, between March 2004 and February 2005. A randomly selected sex- and age-matched reference group (N=957; F=456, M=501) served as control.

### **Results**

Mean age of stroke subjects and controls was 70.9 and 69.6 years ( $P=0.89$ ), male ratio was 55.3% and 58.3% ( $P=0.3$ ) and response rates were 66.5% and 59.5% ( $P<0.05$ ).

Patients were classified as having possible CPSP if they met the four following criteria.

1. Development of pain after stroke onset
2. Overlap between areas of altered sensation and pain
3. Plausible distribution of area with altered sensation or pain
4. No other obvious cause of pain

All 4 criteria were fulfilled by 9.8% of the stroke patients (N=61) and by 0.4% of control subjects (N=2).

Patients with possible CPSP are invited for a clinical examination in order to confirm the diagnosis. 39 patients have been examined to date.

### **Conclusion**

Using predefined criteria, 9.8% of stroke patients were suspected of having possible CPSP.



## Udstillere på årsmødet

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