Journal of the Neurological Sciences (2015) xxx–xxx

Contents lists available at ScienceDirect

Journal of the Neurological Sciences

journal homepage: www.elsevier.com/locate/jns

Neuromuscular Disorders

1107

WFN15-0305

Neuromuscular Disorders

Coincidence of Guillain-Barré syndrome in a patient with cervical spondylotic myelopathy, case report

T. Al-Harbi, S. Abdulmanaa, R. Bunyan. *Neurology Department, King Fahad Specialist Hospital-Dammam, Dammam, Kingdom of Saudi Arabia*

Background: Guillain-Barré syndrome and acute cervical myelopathy can both present as a subacute progressive paraparesis or quadriparesis which may create a diagnostic challenge in the initial presentation. Cranial nerves involvement is more common in Guillain-Barré and is not a feature of cervical myelopathy. Also, cervical myelopathy in the chronic stage recovers with hyperreflexia and spasticity in the lower limbs which are not typically features of Guillain-Barré syndrome.
Case report: We hereby report a case of a 50 –year- old, Saudi Arabian, lady, known to have cervical spondylotic myelopathy(CSM), presented on March 10th, 2014, with neck pain and hands numbness followed by progressive weakness started from the lower limbs. Her diagnosis of cervical myelopathy was made in March 2013 based on radiological evidence of compressive cervical myelopathy at (C4/C5) with cord signal changes, demonstrated by cervical MRI. However, her cerebrospinal fluid studies and electrophysiological and her response to intravenous immunoglobulin were highly consistent with Guillain-Barré syndrome.
Conclusion: Guillain-Barré and cervical myelopathy may co-exist in the same patient. Clinician should suspect Guillain-Barré that is treatable in a patient with cervical myelopathy who presents with symptoms that are not clinically explained by cervical cord compression alone.

doi:10.1016/j.jns.2015.08.1172

1108

WFN15-0834

Neuromuscular Disorders

Thymectomy in patients with Non Thymomatous Myasthenia Gravis: a systematic review. What is the current evidence?

S. Albisu[a], R. Rosada[a], H. Jochen[b], J. Higgie[c], L. Urban[c], A. Perna[b]. [a]*Neurologia, Instituto de Neurología, Montevideo, Uruguay;* [b]*Neurologia y Neuroepidemiologia, Instituto de Neurología, Montevideo, Uruguay;* [c]*Neurologia, Instituto de Neurología, Montevideo, Uruguay*

Background: Thymectomy is a frequently used treatment for myasthenia gravis (MG) and is virtually always indicated in MG patients who have a thymoma. However, the evidence for thymectomy in non-thymomatous MG remains less certain.
Objectives: Evaluate the published evidence on the effectiveness of thymectomy in patients with non thymomatous MG.
Materials and methods: Systematic review of the literature published between 2003-2014. Keywords: "Myasthenia Gravis" "Thymectomy" and "Thymoma". Search Tools: Lilacs and PubMed. Search method: 2 authors read all retrieved abstracts and reviewed the full texts of relevant articles. Selection criteria: Randomized clinical trials, Nonrandomized clinical trials and Cohort studies (prospective and retrospective) of different modalities of thymectomy against no treatment or any medical treatment, and thymectomy plus medical treatment against medical treatment alone, in patients above 16 years old with non-thymomatous MG. Case reports were excluded. Outcome assessed: improvement of myasthenic muscle weakness after thymectomy.
Results: Primary search keywords selected 309 articles. 234 were excluded for not meeting the inclusion criteria. Of the remaining 74, only 4 studies involved some form of control group (medical treatment only), the rest were cohorts that reflected the practice of surgical care centers or comparisons of different surgical techniques without control group. The 4 control population studies were observational and found benefit in thymectomy for non-thymomatous MG.
Conclusion: The indication and timing of thymectomy in non thymomatous MG is still under debate, and there is insufficient evidence to date to provide evidence based clinical practice parameters.

doi:10.1016/j.jns.2015.08.1173

1109

WFN15-1014

Neuromuscular Disorders

Follow-up and management of asymptomatic carriers of amyloidogenic Transthyretin (TTR) gene mutations

F. Barroso[a], H. Schmidt[b], A. González-Duarte[c], I. Conceição[d], L. Obici[e], D. Keohane[f], L. Amass[f]. [a]*Department of Neurology, Raúl Carrea Institute for Neurological Research FLENI, Buenos Aires, Argentina;* [b]*Transplantation Medicine, Universitatsklinikum Münster, Münster, Germany;* [c]*Department of Neurology, Insitituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán, Mexico City, Mexico;* [d]*Department of Neurosciences, Centro Hospitalar Lisboa Norte – Hospital de Santa Maria, Lisbon, Portugal;* [e]*Amyloidosis Research and Treatment Center, Fondazione IRCCS Policlinico San Matteo, Pavia, Italy;* [f]*Pfizer Inc., NY, USA*

Background: Transthyretin familial amyloid polyneuropathy (TTR-FAP) is a rare, autosomal-dominant, adult-onset hereditary disease caused by mutations in the transthyretin (TTR) gene that increase the potential for TTR to deposit as insoluble amyloid fibrils in nerve

0022-510X/$ – see front matter.

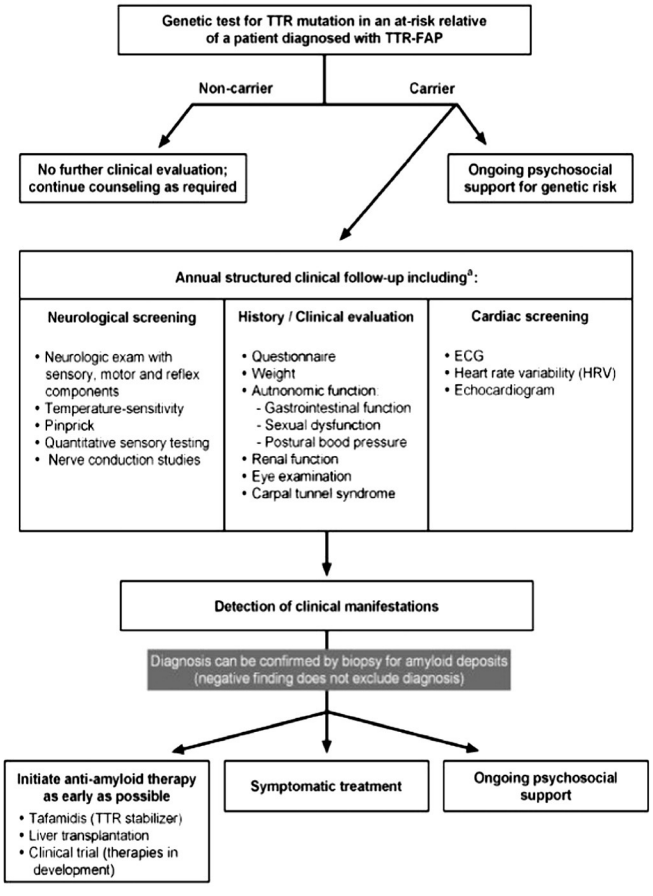
tissue and other organs. Without treatment, this debilitating, multisystem disease, which is characterized by progressive polyneuropathy, leads to death on average within 10 years of symptom onset. With increased availability of tafamidis, a treatment that is particularly effective when initiated in the early stages of disease, early detection of symptomatic disease onset can offer substantial clinical benefits.

Objective: To discuss the follow-up and management of asymptomatic gene carriers of amyloidogenic TTR mutations to enable early detection of symptomatic TTR-FAP and implementation of therapeutic intervention.

Material and methods: These recommendations are based on the authors' expert clinical experience, a search of published literature, and general advice for adult-onset genetic diseases.

Results: Advice will be provided on genetic counseling and predictive genetic testing of first-degree relatives of patients diagnosed with TTR-FAP. Recommendations regarding the follow-up of genetic carriers of TTR-FAP mutations are summarised in Fig. 1.

Conclusion: Genetic testing for amyloidogenic TTR mutations and early detection of symptomatic disease in at-risk individuals may allow therapeutic intervention before accumulation of substantial damage. In the future, presymptomatic treatment of at-risk family members may be indicated.



[a]Consider more frequent monitoring and inclusion of additional tests if there are suspicions the subject may be converting to symptomatic disease, or if the subject approaches the projected age of onset based on TTR mutation and familial history

doi:10.1016/j.jns.2015.08.1174

1112

WFN15-1027

Neuromuscular Disorders

Pediatric Myasthenia Gravis (MG), not very different from adult presentation

M.A. AVARIA, K. Kleinsteuber, C. Heresi, R. Cortes. *Pediatrics Department Campus Norte, Universidad de Chile, SANTIAGO, Chile*

Background: It is usually stated that autoimmune Pediatric MG has distinct clinical features being more likely to manifest with ocular involvement without generalization, and a better prognosis with a higher rate of spontaneous remission.

Objective: To analyze clinical features and long-term outcome in children with MG, in order to determine severity, age related frequency of generalization and remission.

Patients and methods: 52 children with diagnosis of MG followed in our Neuromuscular Clinic (1982-2015).

Results: Age of debut was average 6.7 yrs (8 mo.-17 years) with 88% pre-pubertal children, 23.1% less than 2 years at onset, 50% males. 33 children were AChR-Ab seropositive. 6 seronegative children and 13 in which anti-AChR antibody testing was not available had clinical, electrophysiological and Tensilon test results strongly supportive of diagnosis of autoimmune MG. Special care was taken to rule out other pathologies, especially congenital myasthenic syndromes. 69% presented with ocular symptoms (ptosis/diplopia) with generalization in 77.8%, 89.3% in 3 months following onset, with 19.4% needing ventilator support. Similar rates were found at all ages. Generalized weakness and bulbar involvement at onset predicted worse course, 37.5% myasthenic crisis, 7.7% mortality. Remission rate in 50 patients with > 2 years follow-up was 34%. Thymectomy was performed in 31 patients, followed by complete remission in 8(25.8%). 11 patients with generalized MG not thymectomized, 4(36%) showed complete remission.

Conclusion: MG is a severe disease in children, with high mortality rate and myasthenic crisis irrespective of age at onset, but with more than a third of cases reaching total remission.

Institutional Review Board (IRB) approval was obtained.

doi:10.1016/j.jns.2015.08.1175

1113

WFN15-1509

Neuromuscular Disorders

Study on clinical, MRI and Bbopsy correlation in inherited muscle disease

S. Balakrishnan[a], N. Vasudevan[a], L. Ranganathan[a], S. Govindarajan[a], D. Arjundas[b], K. Bhanu[a]. *[a]Neurology, Madras Medical College, Chennai, India; [b]Neurology, Mercury Hospital, Chennai, India*

Background: Skeletal muscle is the principle organ of locomotion. MRI of diseases muscle shows difference in signal intensity of diseased muscle with a peculiar character of involving particular group of muscle in upper arm and thigh, sparing other groups in the same area, in patients with inherited muscle disease. Which helps in narrowing down the differential diagnosis.

Objective: Study the clinical and radiological correlation in assessment of inherited muscle disease, finally confirmed by muscle biopsy.

Material and methods: This is a prospective study done among patient with inherited muscle disease. All patients were assessed for clinical feature, muscle power grading. Wholebody MRI T1, T2 and

STIR sequence done. Fischer et a. 2008 muscle MRI grading system is used to grade the severity.

Results: In patient with LGMD, pattern of muscle group involved is used to subtype the differentials. The clinical and MRI grading co-relate well with p value <0.001.

MRI was useful in choosing the muscle to be biopsied with sensitivity of 0.96; specificity of 0.94.

All patient with dystrophy on muscle biopsy showed T2 hyperintensity, and STIR sequence showed fatty replacement which correlated with the clinical grading of power examination with p value (<.005).

Conclusion: Muscle MRI is an relatively new line of investigation in identifying the pattern of muscle group affected among subtypes of inherited muscle disease. In future, MRI muscle and clinical finding will categorize the disease, and the diagnosis will likely be obtained with genetic studyies bypassing muscle biopsy in most cases.

1. I have obtained patient and/or Institutional Review Board (IRB) approval, as necessary.

2. An Institutional Review Board (IRB) and/or Animal Use Committee have waived the requirement for their formal approval of the study.

doi:10.1016/j.jns.2015.08.1176

1116

WFN15-1421

Neuromuscular Disorders

Life expectancy of oculopharyngeal muscular dystrophy produced by the (gcn)13/ala 13 expansion mutation in Israels

S.C. Blumen[a], I. Ashkenazi[b], I. Braverman[c]. *[a]Neurology, Hillel Yaffe Medical Center, Hadera, Israel; [b]Surgery, Hillel Yaffe Medical Center, Hadera, Israel; [c]Ear Nose and Tshroat, Hillel Yaffe Medical Center, Hadera, Israel*

Oculopharyngeal muscular dystrophy (OPMD) is a late onset, autosomal dominant, myopathy produced by a stable GCN expansion mutation from the normal (GCN)10/alanine10 to a (GCN)12-18/alanine12-18 in the first exon of the PABPN1 gene on 14q11. Worldwide, OPMD is uncommon. However there are large clusters with high prevalence among French Canadians, Uzbek Jews (UJ) and Hispanic New Mexicans (HNM). In these populations OPMD is produced by the same (GCN)13/alanine13 expansion occurring in different haplotypes and resulting in rather similar phenotypes. The careful assessment of life expectancy (LE) in OPMD is important for conveying accurate prognostic data to patients, carriers and families, planning the proper timing for dysphagia alleviating interventions and evaluating outcomes of therapeutic trials. In Israel we are following OPMD patients belonging to the large UJ cluster as well as Jewish OPMD patients of Bulgarian and other ancestries, all sharing a pathogenic (GCN)13/alanine13 expansion. To assess LE in these cohorts we, retrospectively, obtained data on 89 heterozygotes and 7 homozygotes with OPMD for whom the age and year of death are known and compared their longevity with the general Israeli population using the accepted statistical methods.

In contrast to homozygotes, LE in OPMD heterozygotes was similar to that in the general population for the whole cohort (89 patients) as well as for subgroups of men, women, UJ and other ancestries. Although counterintuitive and intriguing, in the context of severe emaciation and recurrent aspirations in many patients, our results confirm previous results in similar OPMD populations like HNM.

doi:10.1016/j.jns.2015.08.1177

1117

WFN15-0958

Neuromuscular Disorders

Limb girdle muscular dystrophy (lgdm) mutation pattern using next generation sequencing (ngs)

S. Bohlega[a], D. Monies[b], E. Cupler[a], E. Hamoud[a], H. Muhaeza[a], S. Majed[a], B. Meyer[b]. *[a]Neurosciences, King Faisal Specialist Hospital & Research Centre, Riyadh, Kingdom of Saudi Arabia; [b]Genetics, King Faisal Specialist Hospital & Research Centre, Riyadh, Kingdom of Saudi Arabia*

Background: Muscular dystrophies are both phenotypically and genetically heterogeneous providing significant challenges to clinical and laboratory diagnoses. A serial process of sequencing candidate genes has proved to be inefficient and expensive. For instance, the limb girdle muscular dystrophies (LGMD) that can be divided into dominant and recessive forms may result from mutations in over 20 genes. Some are very large and expensive to analyze using the traditional method of Sanger sequencing.

Objective: To study the diagnostic yield of next generation sequencing in a cohort of 60 families with LGMD.

Patients and methods / materials and methods: As part of a panel of 758 genes developed by us for the analysis of inherited neurological disorders using massively parallel next generation sequencing (NGS), we have incorporated all genes associated with the muscular dystrophies.

Results: Sequencing of 60 families clinically diagnosed as LGMD resulted in the underlying gene and mutation being identified in 54 (88%) of these families (28 families – 40%) could be identified with conventional LGMD responsible gene screening. A further six families in which mutations were not identified may point to small regions of relevant genes poorly covered by our assay, mutations in non-coding regions of these genes or to novel genes resulting in the observed phenotype. This approach also identified several cases of aberrant phenotypes expanding the clinical and genetic heterogeneity observed for these disorders.

Conclusion: NGS offers a single and independent means for accurate diagnosis of LGMD and is now the gold standard by which these disorders are diagnosed and characterized.

doi:10.1016/j.jns.2015.08.1178

1118

WFN15-1127

Neuromuscular Disorders

Bone metabolism in patients with myasthenia gravis

N. Braz, E. Vieira, A. Kakehasi, A. Teixeira. *Medicina, Universidade Federal de Minas Gerais, Belo Horizonte, Brazil*

Myasthenia Gravis (MG) is an autoimmune disease characterized by fluctuating muscle weakness. The MG treatment with corticosteroids is initially made; however, its prolonged use is associated with risk of osteoporosis.

Objectives: To define the osteoporosis prevalence in patients with MG and biomarkers measure in peripheral blood from patients with MG and compare to healthy individuals (CG) without use of corticosteroids.

Patients and methods: bone densitometry was performed in the right femoral neck and lumbar spine by DXA technique and the plasma concentrations of TNF, IL-1β, IL-6, OPG, FGF-23, ACTH, DKK1, insulin, leptin, osteocalcin, osteopontin and SOST were analyzed by Luminex®.

Results: 90 MG patients with 42.57 years (mean), presented 13.73 years of time of disease and mean cumulative dose of

corticosteroids 38130.98 mg. The patients had significant reduction in bone mineral density (BMD) of the lumbar, the femoral neck and in the whole body. In MG patients, 14.5% had osteoporosis at the lumbar spine and 3% at the femoral neck. The presence of lumbar spine osteopenia was 10.5% and 21% at the femoral neck. The low bone mass for age in the lumbar spine was 4% and 5% in the femoral neck. Leptin, OPN, insulin and OPG were higher in patients compared with the CG and DDK1 was reduced in the MG patients. There was a negative correlation between femoral neck BMD and the cumulative dose of corticosteroids.

Conclusion: This study demonstrated that MG patients under corticotherapy presented low bone mineral density and impairment in bone metabolism proteins.

doi:10.1016/j.jns.2015.08.1179

1120

WFN15-0608

Neuromuscular Disorders

Clinical features and quality of life in patients with myasthenia gravis

Y. Bykov, A. Smolin. *Neurology, Irkutsk State Medical University, Irkutsk, Russia*

Background: Myasthenia gravis (MG) is an autoimmune disease manifested by muscle weakness and fatigability. Thymectomy has become increasingly accepted as an efficacious procedure for MG. The purpose of this study is to investigate the quality of life in a patients with MG and to determine the prognostic factors predicting MG outcome after operation.

Methods: A total of 103 patients (mean age 36,2 ± 2,4; male – 28,8; female – 71,8%) was divided into two groups, first group with 67 patients after extended trans-sternal thymectomy (TY) and second one is consisting of 36 patients submitted to conservative treatment (CT) according to age and gender. The following data were analyzed: gender, age, and age at the beginning of symptoms, illness duration, follow-up time and type of medical treatment. The patients were evaluated clinically using a quantified MG clinical score (QMGS) and tested by SF-36 self-reported.

Results: Severity of disease in 1 and 2 groups: mild (32,8% and 44,4%), moderate (52,2% and 41,6%), sever (14,9% and 13,8%). Clinical forms of myasthenia: ocular (0 and 33,3%), cranial (0 and 30,5%), bulbar (0 and 19,4), generalized (100 and 16,6%).

Quality of life:

1 group. Physical component - 72 (48; 87). Mental component - 75 (55; 100).

2 group. Physical component - 55 (25; 75). Mental component - 72 (61; 88).

Four clinical types were revealed: 1) remittent; 2) stable; 3) progressive; 4) malignant.

Conclusions: Four groups were revealed in patients with myasthenia (remittent, stable, progressive, malignant). Obtained data demonstrates that thymectomy has advantages over conservative treatment in clinical improvement and quality of life. There were statistical differences between the conservative treatment and thymectomy groups. Best quality of life was registered in patients after thymectomy.

doi:10.1016/j.jns.2015.08.1180

1121

WFN15-1338

Neuromuscular Disorders

Stiff person syndrome: review of 14 patients

V. Cavalcante, A. Souza Bulle Oliveira. *Neurology and Neurosurgery, Federal University of São Paulo, São Paulo, Brazil*

Stiff person syndrome (SPS) is an autoimmune disorder of the central nervous system presenting with muscular rigidity in the axial (trunk) and or limbs muscles; episodic spasms; continuous co-contraction of agonist and antagonist muscles confirmed electrophysiologically and positive serum anti-GAD65 antibodies. Early diagnosis allows treatment and can prevents severe disabilities.

Objectives: To describe patients affected by SPS.

Patients and methods: Retrospective analysis of 14 medical records of patients diagnosed with SPS from January 1989 to April 2015. Results: Gender: 11 women and 3 men. Rating: classic SPS, 9 cases, SL, 5 cases. Index event:1 in the second decade of life, 2 in the third and fifth, 4 in fourth, 5 on sixth. Diagnostic: 1-156 months. Stiffness/rigidity and spasms: thoracolumbar rigidity 14, abdominal 3, cervical 2, 13 in proximal lower limbs, 5 in distal lower limb, 3 in masseter muscle. Spasms precipitated by: emotional upset,10 cases, unexpected noises,11; obstacles,14. Immune diseases: DM, 9 cases; hypothyroidism, 2, hyperthyroidism, 2, vitiligo, 1 , Sjogren S., 1. Psychiatric disorders: depression, 3; bipolar disorder, 1; anxiety specific phobia type (across the street), 4; unspecified anxiety, 4; generalized anxiety,1. Time to diagnosis and work capacity:more than 12 months to diagnosis: 9 inactive patients; less than 12 months for diagnosis: 3 and all active cases. Electromyography: 6 positives. Ac anti GAD65, 14 cases. After beginning treatment with GABAergic drugs: 8 used baclofen (B) and benzodiazepines (D); 3 used only D; 1 only B.

Results: Heterogeneous but there were partial clinical improvement in all. Ten patients used IVIg,1 quit by allergic reaction, 1 for personal reason. he remaining 8 showed clinical improvement more pronounced and permanent that when used GABAergics only.

Conclusion: The results are compatible with literature.

doi:10.1016/j.jns.2015.08.1181

1122

WFN15-0464

Neuromuscular Disorders

Causes of critical illness polyneuropathy in adults after cardiac surgery

N. Davidov, O. Vinogradov, Y. Gorokhovatskiy, A. Kuznetsov. *National Center of Cerebrovascular Disorders, National Pirogov Centre of Therapy and Surgery, Moscow, Russia*

Background: Critical illness polyneuropathy (CIP) is the most common complication of peripheral nervous system after cardiac surgery.

The aim of the research was to determine the cause of critical illness polyneuropathy in the patients who had operations on the heart.

Material and methods: The study included 55 patients (32 men, 23 women) who underwent of surgery on the heart with cardiopulmonary bypass. Patients underwent coronary artery bypass grafting in 52.7% of cases; reconstructive surgery on the heart valves in 47.3% of cases. Patients had characteristics comparable age and sex. All patients used Sevaran as anesthesia. All patients were assessed preoperative, intraoperative and postoperative characteristics.

Stimulation EMG was performed before the operation and on the 7th day after surgery. Estimated amplitude of the M-response to the speed of motor and sensory fibers, F-wave.
Results: 15 patients (7 - men, 8 - women) after heart surgery debuted critical illness polyneuropathy confirmed by EMG. Patients with signs of polyneuropathy in the postoperative period in 100% of cases had multiple organ failure syndrome and systemic inflammatory response, ($p < 0,01$). These patients were longer in the intensive care unit, ($p < 0,05$), longer they were held ventilation, more often required inotropic support, ($p < 0,05$) and more likely to suffer pneumonia, ($p < 0,05$).
Conclusions: Critical illness polyneuropathy can develop in patients that have undergone heart surgery with cardiac bypass as the result of multiple organ injury syndrome and systemic inflammation response syndrome. Comorbidity background, types of heart surgery, the technique of surgical intervention, especially of anesthetic, duration of respiratory care, inotropic support and sedation are not the cause of critical illness polyneuropathy in patients undergoing heart surgery.

doi:10.1016/j.jns.2015.08.1182

1123

WFN15-0579

Neuromuscular Disorders

Calf hypertrophy in charcot-marie-tooth disease: report of nine cases

M. de Freitas, C. Vidal, J.C. Dias, C. Bittar, T. Escada, M.T. Nevares, O.J.M. Nascimento, W. Marques Jr., R.C. Domingues. *Neurology, Federal Fluminense University, Niterói, Brazil*

Background: Charcot-Marie-Tooth (CMT) is the most prevalent hereditary polyneuropathy. Distal calf muscle atrophy usually occurs causing the known “stork leg deformity”. However, there are reports of patients with calf hypertrophy who might have more cramps and a better functional evolution.
Objective: Evaluate patients with calf hypertrophy by the assessment of calf MRI, eletroneuromyography (ENMG), DNA testing, clinical evaluation and CMT Neuropathy Score (CMTNS).
Patients and methods: Nine of the patients with calf hypertrophy and CMT, under public and private practice, were selected to participate in the study and were submitted to a complete evaluation. They all signed an informed consent.
Results: Eight patients were female, age ranged from 25 to 66 years old (median 37yo). Five had DNA analysis with duplication of the 17p11.2 CMT gene. ENMG had demyelinating pattern and denervation of the muscles with no pseudomyotonic activity. The main symptom was pain, in six patients and cramps, in four. All had absent tendon reflexes. Clinical findings included: pes cavus (eight), distal sensory loss in lower limbs (eight), scoliosis (seven) and asymmetric calf hypertrophy (five). The average measure of the calf was 36 cm (range = 32-44 cm). MRI of the legs showed fatty infiltration of the legs muscles in six patients. All patients are independent. According to the CMTNS, most patients have moderate disability (five).
Conclusion: Calf hypertrophy is not due to the muscle enlargement but caused by pseudohypertrophy of the legs. The evaluation with legs MRI might help to guide the physical therapy of the CMT patients in the future.

doi:10.1016/j.jns.2015.08.1183

1124

WFN15-1332

Neuromuscular Disorders

Fosmn Syndrome: a Tdp-43 proteinopathy?

P.S. Dhawan[a], B.P. Goodman[a], C. Toro[b], P.J.B. Dyck[c], C. Giannini[c], E.P. Bosch[a]. *[a]Neurology, Mayo Clinic Arizona, Scottsdale, USA; [b]Neurology, NIH, Bethesda, USA; [c]Neurology, Mayo Clinic Rochester, Rochester, USA*

Background: Facial onset sensory and motor neuronopathy (FOSMN) syndrome is a rare neurologic disorder characterized by facial-onset numbness, bulbar symptoms and progressive sensorimotor deficits following rostro-caudal distribution. The pathophysiologic etiology remains unclear. Immune mechanisms have been proposed however lack of response to immunotherapy, presence of D90A-SOD1 mutation in one patient, and an autopsy revealing glial cytoplasmic TDP-43 inclusions suggests a neurodegenerative etiology.
Objective: To describe the clinical, electrodiagnostic, genetic and pathological features of FOSMN syndrome.
Patients and methods: Patients diagnosed with FOSMN syndrome at Mayo Clinic Arizona and Rochester were retrospectively reviewed. Patients with facial-onset numbness, bulbar and rostro-caudal weakness were included.

Electrodiagnostic testing was performed at Mayo Clinic laboratories. Nerve biopsies and autopsies were processed by Mayo Clinic Peripheral Nerve and Neuropathology laboratories, respectively. Genetic testing was performed at NIH.
Results: 14 patients were included. Presentation began with facial numbness and burning tongue with eventual bulbar and rostro-caudal sensorimotor deficits. 7 underwent aggressive immunotherapy without response. 5 died (respiratory failure), averaging 7 years from onset. Nerve conductions showed abnormal blink and upper extremity sensory responses, with evidence of neurogenic, rostro-caudal denervation on needle examination. Autopsies (2) showed glial cytoplasmic TDP-43 inclusions in brainstem without evidence of inflammation. Genetic testing (6) is pending.
Conclusion: We report the largest case series of FOSMN syndrome. The presence of glial cytoplasmic TDP-43 inclusions implies FOSMN may join ALS and other neurodegenerative diseases as a TDP-43 proteinopathy. Recommendation is against immunotherapy in patients with thoughtful workup and clinical suspicion for FOSMN syndrome.

doi:10.1016/j.jns.2015.08.1184

1125

WFN15-1125

Neuromuscular Disorders

Possible cognitive dysfunction in patients with duchenne muscular dystrophy

I.C. Domingos, T.M.O. Dias, T.C. Sanches, J.Z. Melani, A.J. Godoy. *Neurology, Faculty of Health Sciences of Barretos, Barretos, Brazil*

Background: Duchenne Muscular Dystrophy (DMD) is a genetic condition that affects only boys and is characterized by a progressive muscle weakness and death. Although the clinical features about the muscle weakness is well documented, less is known about cognition performance.
Objective: Verify the association between DMD and neurologic disorders.
Patients and Methods: We selected six DMD patients from an outpatient clinic for neuromuscular diseases between 2015 February and 2015 April. They gave proper approval. The tests used were The Mini Mental State Examination (MMSE) presenting sensitive criteria

to moderate to severe cognitive deterioration and Montreal Cognitive Assessment (MoCA) presenting sensitive criteria to mild cognitive deterioration. The maximum score of both tests is thirty points. The test is positive when the score is lower than 27 points in MMSE and 26 in MoCA.
Results: At the study we analyzed patients in ages between five and twenty eight years old. The results of the applied tests were in mean 27.2 for MMSE and in mean 18.3 for MoCA whereas the score in delayed recall was 1.3 in mean and 2.7 in visuoperception.
Conclusion: The study has shown that the average performance of the DMD patients was lower than the expected, which may indicate a possible cognitive disorder, especially by the MoCA test. It was noticed that the lowest score was at delayed recall and visuoperception.

doi:10.1016/j.jns.2015.08.1185

1129

WFN15-1561

Neuromuscular Disorders

Hirayama´s disease: new case in western countries

K.M.C. Henriques, M.A. Orsini, A.C.A.F. Ferreira, D. Szklarz, A. Kirmse, L. Kosow, C.O. Vilaça, A.M. Calheiros, R.C. Silveira, T.P.R. Benevides, T.N. Magalhães, M.A.A. Leite, J.M. Osvaldo, M.R.G. Nascimento Freitas. *Neurology, Universidade Federal Fluminense, Rio de Janeiro, Brazil*

Background: Hirayama's disease (HD) is frequently found in Asia, and is rarely referred among westerners. It results from the involvement of anterior horn cells in the spinal cord.
Objective: Report the case of a patient with weakness on right hand and severe gripping difficulty.
Patients and Methods: Compare the case described with cases reported in the literature.
Results: A 14-year-old man has been showing difficulty in activities that demand dexterity and gripping since last eight months. The atrophy in intrinsic muscles of the right hand was evident. Throughout three months, he noticed atrophy of his right forearm and hand. His past medical history has no trauma reference. No other family members had neuromuscular complaints.

The electromyography showed reduction of the polyphasic motor action potentials with an increased amplitude and fasciculation of the right forearms and hand muscles. The neuroconduction study was normal. Muscle groups of the contralateral upper limb also presented fasciculation's potentials. The cerebrospinal fluid exam was normal.

The cervical MRI displayed a spinal cord bottleneck at the last cervical segments with a T2 signal change. While flexing the neck, there was a reduction of the dural space.
Conclusion: We must take into consideration that Hirayama's disease is a benign amyotrophy of distal upper limbs that mainly affects young male patients. It evolves slowly and is followed by stabilization in 2-4 years. The use of the neck brace may provide improvement and should be introduced as soon as the diagnosis is confirmed.

doi:10.1016/j.jns.2015.08.1186

1131

WFN15-0198

Neuromuscular Disorders

Whole body muscle mri correlates with muscle function in patients with adult onset pompe disease

J. Díaz-Manera[a], S. Figueroa[a], J. Llauger[b], I. Belmonte[c], S. Segovia[a], G. Suárez-Cuartin[d], M. Mayos[d], E. Gallardo[a], I. Illa[a], S. Spanish Pompe Study Group[a]. [a]*Neurology, Institut de Recerca Biomèdica - Hospital de Sant Pau, Barcelona, Spain;* [b]*Radiology, Institut de Rescerca Biomèdica - Hospital de Sant Pau, Barcelona, Spain;* [c]*Physiotherapy, Institut de Recerca Biomèdica - Hospital de Sant Pau, Barcelona, Spain;* [d]*Respiratory, Institut de Recerca Biomèdica - Hospital de Sant Pau, Barcelona, Spain*

Introduction: Adult onset Pompe disease is disorder produced by mutations in the AAG gene and characterized by progressive limb and respiratory muscle weakness. Treatment with enzyme replacement can improve or stabilize muscle function. Our aim is to investigate whether the degree of muscle atrophy in whole body MRI correlates with muscle function in these patients.
Methods: A clinical evaluation including physical examination, functional studies, respiratory assessment, quality of life scales (QOL) and whole muscle MRI was performed. We analyzed the degree of muscle atrophy on T1 sequences using Mercuri scale. We defined Muscle MRI score as the sum of Mercuri scale for all muscles. We used Pearson test to analyze correlation between two values, considering statistically significance p value lower than 0.05.
Results: We enrolled 30 patients (mean age 46.2 yo). 25/30 patients had weakness and 5/30 patients had only hyperckemia. 22 of the 25 symptomatic patients were under ERT. Muscle MRI score ranged from 0 to 210 points. There was a positive correlation between muscle MRI score and the following parameters: muscle strength, muscle function (MFM-20, 6MWT, Activlim scale) and QOL (sf36 and Inquol). In contrast Muscle MRI did not correlate with respiratory function.
Conclusion: The degree of muscle atrophy in Muscle MRI studies has a good correlation with muscle strength, muscle functional scales and quality of life scales in adult onset Pompe patients. Muscle MRI could be useful to follow up patients under treatment and therefore changes in muscle MRI coul be a good end-point objective in clinical trials.

doi:10.1016/j.jns.2015.08.1187

1132

WFN15-0955

Neuromuscular Disorders

Etiologies of the polyneuropathies in elderly patients

H. Graviotto[a], M. Buezas[a], R. Diaz[a], M. Perez Akly[a], A. Gomez[b], M. Esnaola y Rojas[a], E. Fulgenzi[a,*]. [a]*Neurology, Unidad Asistencial Por Más Salud Dr. César Milstein, CABA, Argentina;* [b]*Neurology, INEBA, CABA, Argentina*

Background: Polyneuropathies are common neurological disorders. Their prevalence is estimated at 2.3%, but increase to 8% over the age of 55 years. Little has been described about the etiologies of the polyneuropathies in elderly patients.
Objective: To describe the etiologies of the polyneuropathies in patients of 60 years or older.
Methods: We analyzed retrospectively the medical histories of patients with diagnosis of polyneuropathy and an age of 60 years or older that were evaluated in our neuromuscular diseases clinic between June 2009 and December 2014. The etiologies of these neuropathies were investigated, and also if they were previously known or had been found during the diagnostic work up.
Results: 144 patients were included. Their median age was 77 (+-7.5 DS) years, and 68.3% were women. The most frequent association of the polyneuropathy was with hypothyroidism (42 patients), followed by diabetes (34 patients). 31 patients had an idiopathic polyneuropathy, and 20 had an immunological etiology, 8 of them with monoclonal gammopathy. In 30% patients a cause associated with the polyneuropathy was found during the diagnostic work up, the most

frequent were immune-mediated neuropathy (11 patients) and diabetes and prediabetes (6 patients in each group).
Conclusion: It is remarkable in our study an unexpected high frequency of hypothyroidism in elderly patients with polyneuropathy, not described in other populations. The other etiologies were found with a similar frequency to that of the literature.

doi:10.1016/j.jns.2015.08.1188

1133
WFN15-0977
Neuromuscular Disorders
Comparison of the evolution between three brothers with duchenne muscular distrophy

F.V. Rezende, A.C.F. Galuban, T.M. Sousa, A.J. Godoy. *Neurology, Faculty of Health Sciences of Barretos, Barretos, Brazil*

Background: Duchenne Muscular Dystrophy (DMD) is an X-linked hereditary progressive disease.
Objective: To describe three patients from a same family.
Patients: The older patient is 15 years-old. Another one is 14 and the youngest is 5. The first two boys were diagnosed at the same time, when they were 7 and 6 y.o. There was a fast progression of the disease, compared to other patients. They took prednisolone late in the course of the disease. After three years they could not walk. The 5 y.o. patient had diagnosis confirmation by the age of 2. Two years later steroid was prescribed.
Conclusion: The presence of three boys in the same family with a fatal, hereditary disease, as DMD is rare. It reflects a lack of knowledge about that condition by many parents as well as an emotional disequilibrium showing an inability to deal with the real chances of the occurrence of the disease.

doi:10.1016/j.jns.2015.08.1189

1134
WFN15-0849
Neuromuscular Disorders
Polyradiculoneuropathy x reaction in hansen

S. Gomes. *Neurology, B.Portuguesa, Sao Paulo, Brazil*

Polyradiculoneuropathy Associated x Reaction In hansen

Hansen is an infectious disease that affects the skin and peripheral nerves, presenting usually as multiple mononeuropathy.
Objective: To describe an unusual case of polyradiculoneuropathy in patient diagnosed with leprosy.
Case report: Female, 42 diagnosed with BB form leprosy at age 30, treated with MDT MB regimen without reaction sought the outpatient clinic with low back pain started five weeks. Patient developed hypoesthesia in the feet and hands associated with proximal and distal paresis in lower limbs, with slight asymmetry, culminating in inability to walk in 3 weeks. The patient was confined to a wheelchair, with quadriceps atrophy, paresis in the lower limbs grade II and grade Proximal IV in upper limbs, generalized areflexia, standard thermoalgesic anesthesia in boots and gloves and erythematous plaques in the lower back and legs. CSF analysis revealed albumin-cytological dissociation and electrophysiological study with no sensory responses and motor nerve demyelinating. Dermatological and histopathological evaluation confirmed that this is reverse reaction without leprosy relapse evidence. It started methylprednisolone with progressive improvement of the dermatological and neurological status.
Conclusion: The therapeutic response suggests the diagnosis of polyradiculoneuropathy associated with reactional state in leprosy.

doi:10.1016/j.jns.2015.08.1190

1135
WFN15-0859
Neuromuscular Disorders
Post polio syndrome

S. Gomes. *Neurology, B.Portuguesa, Sao Paulo, Brazil*

Post Polio Syndrome
Introduction: Post-polio syndrome occurs in 15 years or more after previous frame polio, represented by muscle weakness, fatigue, and muscle pain joints, resulting in a decrease in functional capacity and / or the emergence of new disabilities may occur dysphagia and dyspnea.
Objective: Reporting the case of post-polio syndrome.
Method: A case report of post-polio syndrome.
Results: Male patient, 59, with previous framework of polio in childhood, with paresis and left lower limb atrophy. examination showed signs of first and second motor neuron in direct hemibody with abolition of bilateral patellar reflexes and ankle right, and most obvious fasculações in neck and lower back. He underwent Electrodiagnostic studies and evoked potential, which showed signs compatible with previous polio disease. We conducted a study CSF lumbar, cervical neuroimaging, craneo and lower back.
Conclusions: There is a good response to physical therapy planning and improves the emotional aspect from diagnosis to occur.

doi:10.1016/j.jns.2015.08.1191

1136
WFN15-0861
Neuromuscular Disorders
Neuromyelitis optica x spectrum manifestations

S. Gomes. *Neurology, B.Prtuguesa, Sao Paulo, brazil*

Post Polio Syndrome
Introduction: Post-polio syndrome occurs in 15 years or more after previous frame polio, represented by muscle weakness, fatigue, and muscle pain joints, resulting in a decrease in functional capacity and / or the emergence of new disabilities may occur dysphagia and dyspnea.
Objective: Reporting the case of post-polio syndrome.
Method: A case report of post-polio syndrome.
Results: Male patient, 59, with previous framework of polio in childhood, with paresis and left lower limb atrophy. Examination showed signs of first and second motor neuron in direct hemibody with abolition of bilateral patellar reflexes and ankle right, and most obvious fasculações in neck and lower back. It underwent Electrodiagnostic studies and evoked potential, which showed signs compatible with previous bone marrow tip disease. We conducted a study CSF lumbar, cervical neuroimaging, craneo and lower back.
Conclusions: There is a good response to physical therapy planning and improves the emotional aspect from diagnosis to occur.

doi:10.1016/j.jns.2015.08.1192

1137

WFN15-1360

Neuromuscular Disorders

Myelopathic-tropical spastic paraparesis caused by HTLV-1: I

S. Gomes. *Neurology, B.Portuguesa, Sao Paulo, Brazil*

MYELOPATHIC-TROPICAL SPASTIC PARAPARESIS CAUSED BY HTLV-1:
Introduction: Myelopathic-Tropical spastic paraparesis caused by HTLV-1 is a neurological disease that causes a chronic and progressive inflammatory process of the spinal cord, progressing to demyelination in patients with HTLV-1s The neurological condition is characterized by spastic paraparesis with extensive involvement of the pyramidal tracts, causing motor and sensory impairment, bladder and bowel sphincter disturbances, and erectile dysfunction in men.
Objective: Report a case of tropical spastic paraparesis caused by HTLV-I infection.
Report of case: Female patient of 39 years old, diagnosed with HTLV-I, infected by blood transfusion, having muscular weakness as initial clinical symptom 12 years ago, and worsened progressively in recent years, associated with frequent falls, and 05 years ago stopped walking, requiring a wheelchair. Presents today recurrent urinary infections as a result of urinary incontinence and use of diapers for 3 year. At the neurological exam, showed maximum force in all the segments of upper limbs, while in the lower limbs presented force level 2 in the left and right proximal segments and in the left distal segment; the right distal segment presented level 3. Regarding to reflexes, the bicipital, tricipital and estilorradial presented hyperactives, having positive Hoffmann. Patellar and aquileo, also showed to be hyperactives, with Babinski and positive clonus. The tactile and vibratory sensitivity were normal in the upper and lower limbs. Muscle spasticity using the Ashworth scale was grade 3 for the adductor and quadriceps femoris bilaterally, and grade 04for sural triceps bilaterally. Was made the relative quantification of gene expression of Th1 cytokines (IFN and TNF) that were greatly expressed, Th2 (IL-4) that showed reduced by antagonism with Th1 and a profile of regulatory T cells (IL-10 and TGF), where IL-10 was very low, but the TGF was high due to its function of neural repair.
Discussion: The motor disability of patients with HAM/TSP and low back pain significantly interferes with daily activities and can lead to functional limitations. Muscle strengthening is critical to clinical improvement. The inflammatory response triggered by IFN is probably involved in the progression and clinical outcome of the disease in infected individuals, but not in relation to IL-4. Studies show that IFN is closely related to the development of HAM/TSP.

doi:10.1016/j.jns.2015.08.1193

1138

WFN15-0388

Neuromuscular Disorders

Clinical and genetic aspects of late-onset pompe disease in northeast Brazil (State of Ceará)

F.A.A. Gondim[a], C.L. Rodrigues[b], J.W.L. Tavares Jr.[c], A.A. Morais[c], A.P. Melo Neto[c], C. Schiavon[d], M.A. Holanda[e]. *[a]Internal Medicine-Neurology Division, Universidade Federal do Ceará, Fortaleza, Brazil; [b]Neurology Division, Hospital Geral de Fortaleza, Fortaleza, Brazil; [c]Neurology Division, Universidade Federal do Ceará, Fortaleza, Brazil; [d]Hospital Universitário Walter Cantídio-Neurology Division, Universidade Federal do Ceará, Fortaleza, Brazil; [e]Internal Medicine, Universidade Federal do Ceará, Fortaleza, Brazil*

Background: Late-onset Pompe disease (LOPD) is characterized by a slowly progressive myopathy due to deficiency of α-glucosidase.
Objective: To report the clinical, electrodiagnostic and genetic findings of 4 patients with LOPD from Northeast Brazil.
Material and Methods: We reviewed the medical, genetic and electrodiagnostic findings of 4 patients with LOPD seen at Hospital Universitário Walter Cantídio (2 were diagnosed at another institution and referred for evaluation of pulmonary status).
Results: Mean age of diagnosis was 40.3 ± 11.4 years (SEM), 3 men. All 4 had heterozygous mutations: 1.c.-32-13 T > G(5´UTR) & c.2501_2502delCAp.T834Rfs*49 (exon 18); 2. c.32-13 T > G & c.525delT p.E176RFs*45 (exon 2); 3 and 4. c-32-13 T > G (intron 1) & deletion on exon 18 (brother and sister). No patient was wheelchair-bound. Two patients (brother and sister) had classic limb-girdle phenotype and onset around 19-20 years. Two older patients had very atypical presentations. One had exercise-induced dyspnea since young-adulthood but was only diagnosed after respiratory failure and pneumonia. The other had a limb-girdle weakness pattern since age 40 and developed progressive dyspnea since age 50. Electrodiagnostic testing revealed neuropathy and myopathy in 2 and myopathy with paravertebral myotonic discharges in 2. One patient was initially diagnosed with critical care neuromyopathy with phrenic nerve paralysis. All 4 patients were treated with Myozyme (alglucosidade α) for at least 6 months, with significant clinical improvement.
Conclusion: The spectrum of LOPD is diverse and clinical course significantly improved by enzyme replacement. Recent availability of genetic testing has greatly improved our ability to establish diagnosis of LOPD in the state of Ceará, Brazil.

doi:10.1016/j.jns.2015.08.1194

1139

WFN15-0774

Neuromuscular Disorders

Hypokalemic paralysis and crohn's disease (cd): report of two cases

D. Farias de Araújo[a], R.O. Cavalcante[a], A.P. Melo Neto[a], P.L. Cabral[a], J.G.A. Gomes[a], L.L.B.C. Braga[b], M.H.L.P. Souza[b], F.D.A.A. Gondim[a,*]. *[a]Internal Medicine-Neurology Division, Universidade Federal do Ceará, Fortaleza, Brazil; [b]Internal Medicine-Gastroenterology Division, Universidade Federal do Ceará, Fortaleza, Brazil*

Background: Hypokalemic Paralysis (HP) is a rare condition that can be acquired or due to an inherited channelopathy.
Objective: To describe the clinical, electrodiagnostic and neurological findings of two patients from a cohort of Brazilian Inflammatory Bowel Disease (IBD) patients who presented with hypokalemic paralysis.
Methods: Patients underwent neurological evaluation, including detailed neurological exam and electrodiagnostic testing. The study was approved by the local IRB.
Results:

Patient 1: A 18 year-old man with a 2-year history of CD presented with acute generalized muscle weakness, dysarthria and limb paresthesias. Initial tests revealed hypokalemia (2.8 mEq/L), hypocalcaemia and hypomagnesaemia. Hypokalemic paralysis was diagnosed. Replacement of electrolytes was performed, with full recovery of muscle strength. Exams showed normal urinary electrolytes and preserved renal function. Patient had had major weight loss in the prior months and important generalized muscle atrophy. EMG revealed generalized axonal sensorimotor neuropathy.
Patient 2: A 30 year-old female with 10 years of CD presented with acute generalized paralysis and hyporreflexia. Initial evaluation showed hypokalemia (1.5 mEq/L), hypocalcaemia and hyponatremia. After

electrolytes replacement, the paralysis was reversed. Further investigation showed normal urinary electrolytes and preserved renal function. She subsequently had seizure episodes, several bouts of CD relapse, associated with fistulae as well as additional episodes of weakness also associated with lower limbs paresis and edema. Clinical improvement happened after the stabilization of the CD relapse. EMG revealed right peroneal neuropathy at the fibular head.

Conclusions: HP may be present in patients with CD, secondary to fecal/diarrheal potassium loss and bowel inflammation.

doi:10.1016/j.jns.2015.08.1195

1140

WFN15-1154

Neuromuscular Disorders

Pompe disease in a brazilian city: the prevalence of a rare disease in a symptomatic population sample

T. Grippe[a], E. Dias Tosta[b], M. Wilkley[a], M.F. Ferreira[a], L. Seguti[a]. [a]*Neurology, Hospital de Base do Distrito Federal, Brasília, Brazil;* [b]*Neurology, Academia Brasileira de Neurologia, Brasília, Brazil*

Background: Pompe disease, also known as glycogen type II deposit disease, happens because of a glycogen lysosomal deposit due to the acid-alfa-glucosidase enzyme deficit. It is a rare metabolic myopathy with a broad range of clinical presentations, which includes weakness and hypotonia. The diagnosis is made by the measurement of the enzyme activity in a dry drop of blood (DBS) and confirmed by the measurement in another tissue.
Objective: To evaluate the prevalence of Pompe disease in a population with suggestive symptoms in the city of Brasilia-DF, Brazil.
Patient and Methods: Patients with suggestive symptoms or electromyography pattern of myopathy were elected to perform the DBS test. If the result was positive, it was confirmed with the measurement of the enzyme activity in a fibroblast culture (FCM) to assure the diagnosis.
Results: Between 2011 and 2015, 87 patients were submitted to DBS test, 5 of them had a positive result. However, when submitted to the second test only 3 of them had a confirmed diagnosis, the other two, heterozygotes, did not had enough criteria for treatment. Considering that the FCM was the gold standard, in this symptomatic sample, 60% of the DBS positive test were true positive.
Conclusion: The prevalence of Pompe disease in our population was of 3, 45%. It was in accordance with two other studies realized in neuromuscular centers, with a prevalence of 4 and 5, 3%. This number is much bigger than the general prevalence of 1: 40.000, because it was calculated in a symptomatic population.

doi:10.1016/j.jns.2015.08.1196

1142

WFN15-1426

Neuromuscular Disorders

The potential role of cell surface complement regulators and circulating cd4+ cd25+ t-cells in the development of autoimmune myasthenia gravis

M. Thabit, M. Fattouh, A. Nasreldin. *Microbiology and Immunology, Sohag University Hospital, Sohag, Egypt*

Background: Regulatory T cells (Treg cells) and regulators of complement activity (RCA) involving CD55 and CD59 play an important role in the prevention of autoimmune disease, however their role in the pathogenesis of autoimmune myasthenia gravis (MG) remains unclear.
Objective: Our study aimed to assess the frequency of peripheral blood $CD4^+CD25^+$ T-reg cells and $CD4^+$ T-helper cells and the RBCs level of expression of CD55 and CD59 in MG patients.
Patients and Methods: Fourteen patients with MG and ten age matched healthy controls participated in the study. We assessed the percentage of peripheral $CD4^+CD25^+$ T-reg cells and $CD4^+$ T-helper cells and the level of expression of CD55 and CD59 on RBCs in the peripheral blood of patients and controls.
Results: There was a statistically significant decrease in the percentage of peripheral blood $CD4^+CD25^+$ Treg cells and $CD4^+CD25^+$ T-reg/$CD4^+$ T-helper cell ratio in the MG patients group (P value < 0.05). Moreover, the level of expression of CD55, CD59 and dual expression of CD55/CD59 on RBCs were statistically significantly lower in MG patients than those of healthy controls ($P < 0.001$). However; regression analysis revealed that there was no significant correlation between all the measured parameters and disease duration or staging.
Conclusion: We can conclude that functional defects in the Treg cells and RCA may play a role in the pathogenesis of autoimmune MG and their functional modulation may represent an alternative therapeutic strategy for MG treatment.

doi:10.1016/j.jns.2015.08.1197

1143

WFN15-1215

Neuromuscular Disorders

Electrochemical skin conductance in patients with carpal tunnel syndrome

J. Idiáquez[a], J. Basso[b], L. Garcia[b], J. Gigoux[b]. [a]*Neurologia, Universidad de Valparaiso, Valparaiso, Chile;* [b]*Neurologia, Hospital Naval, Vina del Mar, Chile*

Background: Studies suggest that C-fibers are affected in entrapment neuropathies. In carpal tunnel syndrome (CTS) there is reduction of intraepidermal nerve fiber density.
Objective: To assess small fiber function using electrochemical skin conductance (ESC) in patients with CTS.
Patients and Methods: 10 patients with electrophysiologically confirmed CTS and 20 control subjects. Sweat gland function in the palms was assessed non-invasively with SUDOSCAN (Impeto Medical, Paris France) device. Nerve conductions were performed according to AANEM. Stevens´s scale (three grades) was used for grading of severity of nerve conduction abnormalities. The Boston CTS questionnaire symptoms domain (BCTQ-symptoms) was used to assess subjective symptoms.
Results: CTS patients (4 with hypothyroidism, 1 with diabetes), BCTQ-T was 23.1 ± 10.3. Seven CTS were bilateral. Severity: mild = 4, moderate = 4, severe = 2. In CTS patients mean ESC in hands was $68.2 \pm 9.6\mu S$ and in controls was $68 \pm 15.8\ \mu S$. In bilateral CTS patients, mean ESC in hands was $69.6 \pm 2.1\ \mu S$. In unilateral CTS mean ESC in the affected hand was $62.3 \pm 12\ \mu S$ and the non affected hand was $69 \pm 11.3\ \mu S$. Asymmetry in unilateral CTS was 9 ± 2.8 % and in controls was 3.5 ± 2.9%.
Conclusions: Assessment of electrochemical skin conductance could be useful to detect palm sweat gland dysfunction in a subgroup of CTS patients.

doi:10.1016/j.jns.2015.08.1198

1144

WFN15-1541

Neuromuscular Disorders

Symptoms associated with electrophysiologically graded severity in unilateral and bilateral carpal tunnel syndrome

J. Idiáquez[a], J. Gigoux[a], C. Aguilera[a], R. Guiloff[b]. [a]*Neurologia, Universidad de Valparaiso, Valparaiso, Chile;* [b]*Neuromuscular Unit, Charing Cross Hospital and Imperial College, London, United Kingdom*

Introduction: Objective clinical and electrophysiological assessments of carpal tunnel syndrome (CTS) severity are considered relevant for management.
Objective: To evaluate the clinical relevance of severity graded nerve conduction studies (NCS) in unilateral and bilateral CTS symptoms.
Methods: Cross sectional study. 69 consecutive CTS, (45 unilateral, 24 bilateral). Symptoms assessed with the Boston CTS questionnaire symptoms domain (BCTQ-symptoms) and Hamilton depression rating scale (HAM-D). NCS performed according to AANEM recommendations. Electrophysiological severity grading with Stevens' scale (1 = mild, 2 = moderate, 3 = severe) and Bland´s classification (0-6 grades and adapted 3 grade scale matching Stevens') used for grouping the BCTQ-symptoms and HAM-D scores.
Results: Unilateral CTS. BCTQ-symptoms (total mean score 33.2 ± 7) score increased with increasing grades but was only statistically significant between mild and severe Stevens' grades groups. HAM-D score (total mean score 10.7 ± 12.5) was significantly higher only in the adapted moderate Bland grade group ($p < 0.01$).

Bilateral CTS: BCTQ-symptoms (total mean score 32.8 ± 8.2), did not show differences across both Stevens´ and Bland´s grades. HAM-D (total mean 10.1 ± 12.8) score was significantly higher only in the moderate grade group of the adapted Bland scale.
Conclusion: BCTQ-symptoms and HAM-D mean scores were similar in unilateral and bilateral CTS. Stevens' scale showed BTCQ-symptoms differences between mild and severe electrophysiological grade groups in unilateral CTS. Only Bland's adapted scale showed higher HAM-D scores in its moderate grade groups for unilateral and bilateral CTS. The positive findings were not consistent between the two scales. A larger sample is needed to confirm these findings.

doi:10.1016/j.jns.2015.08.1199

1145

WFN15-0290

Neuromuscular Disorders

Are there any predictive factors for bilateral carpal tunnel syndrome?

I. Joo, Y.I. Eom. *Neurology, Ajou University School of Medicine, Suwon, Korea*

Background: Carpal tunnel syndrome (CTS) is the most common focal entrapment neuropathy at the wrist. Many studies about risk factors for CTS have been explored, but there are only a few studies for predictive factors of bilateral CTS (biCTS).
Objectives: To determine which factors are related with occurrence of biCTS.
Patients and Methods: A total of 82 electrodiagnostically confirmed CTS patients participated: 22 patients with unilateral CTS (uniCTS) and 60 with biCTS. Parameters related with CTS were compared between uni- and biCTS groups. Next, 26 patients with biCTS with a sequential symptom onset were compared with uniCTS patients for various parameters including electodiagnostic and ultrasound test results.
Results: There was no significant difference on age, sex, BMI, handedness and median symptom duration between uni- and biCTS patients. But mean HbA1c level was significantly higher in biCTS group (5.7 ± 0.3% vs. 6.1 ± 0.7%, $p = 0.011$). The prevalence of DM or HbA1C level, however, did not show any difference between patients with uni- and with biCTS with a sequential symptom onset. Only BMI was marginally higher in the latter group (23.3 ± 2.7 kg/m^2 vs. 25.4 ± 3.9 kg/m^2, $p = 0.047$). In addition this group showed more severe findings on the electrophysiological and ultrasonographical tests.
Conclusion: BMI, electrodiagnostic and ultrasound findings might be considered as predictive factors for biCTS, especially after unilateral involvement.

doi:10.1016/j.jns.2015.08.1200

1146

WFN15-0468

Neuromuscular Disorders

Pathology and genetics of congenital myopathies in single neuromuscular center in Korea

D.S. Kim[a], J.H. Shin[a], Y.E. Park[b]. [a]*Department of Neurology, Pusan National University Yangsan Hospital, Yangsan-si Gyeongnam, Korea;* [b]*Department of Neurology, Pusan National University Hospital, Busan, Korea*

Background: Congenital myopathies (CMPs) are a group of rare inherited myopathies caused by heterogenous genetic etiologies.
Objective: In this study, we aimed to identify subtypes and genotypes of CMPs from our muscle biopsy depository.
Patients and Methods: We have reviewed our muscle biopsy record and selected cases of CMPs based on clinical and pathological findings. For the selected cases, either targeted sequencing or whole exome sequencing (WES) was performed in order to identify the genetic cause. This study was approved by institutional review board of PNUYH.
Results: From 1999 to 2015, 33 cases of CMPs were diagnosed among 773 muscle biopsies (~4%). The subtypes and numbers of each type of CMPs are as follows; nemaline myopathy (15), central core disease (5), centronuclear myopathy (5), core-rod myopathy (3), congenital fiber type disproportion syndrome (2), myotubular myopathy (1), cap myopathy (1), and rigid spine syndrome (1). Among them, causative mutations were identified in 17 cases.
Conclusion: Our study suggests current technological limitation of WES in the genetic diagnosis of individual patient with CMP, especially when the causative gene is still illusive, extremely large, or has long repetitive sequences. For example, we were only able to identify *NEB* mutations in both allele of six patients among 13 patients with autosomal recessive nemaline myopathies. In other five, only single *NEB* mutation was identified, and no mutation was identified in the other two. Our study shows careful sequencing strategy combining Sanger sequencing and WES is still essential in genetic diagnosis of CMPs.

doi:10.1016/j.jns.2015.08.1201

1147

WFN15-1187

Neuromuscular Disorders

Diagnostic performance of a multivariate model of normal epidermal nerve fiber (enf) density for skin-biopsy diagnosis of small-fiber polyneuropathy (sfpn)

M.M. Klein[a], H.M. Downs[a], A.L. Oaklander[b]. [a]*Neurology, Massachusetts General Hospital Harvard Medical School, Boston, USA;* [b]*Neurology and*

Pathology, Massachusetts General Hospital Harvard Medical School, Boston, USA

Background: Distal-leg skin biopsies are an endorsed objective test for confirming SFPN. ENF densities ≤5th centile of the population distribution are considered diagnostic of SFPN. Most laboratories use a single threshold (e.g., 3.8 ENF/linear mm) to determine normality of ENF results. The value of factoring demographics into diagnostic thresholds is untested.
Objective: To develop and test a model of normal ENF density that incorporates demographics.
Materials and Methods: With IRB permission, we obtained distal-leg skin biopsies from 373 normal volunteers (8-92 years) including 42 children. PGP9.5-immunolabeled ENF were measured using standard clinical methods.
Results: Young people aged 8-23 had far more ENF than older adults (426 vs. 227/mm^2; $p < 0.001$). Females had more ENF than males (314 vs. 247/mm^2; $p < 0.001$) and Asians had more than age-matched Whites, Blacks, and Hispanics (336 vs. 237/mm^2; $p < 0.001$). 13 subjects ≤23 years with repeat biopsies at different ages lost 46 ENF/mm^2 on average per year, whereas older subjects ($n = 9$) lost 13 ENF/mm^2 per year. We developed and compared a multivariate model of ENF density incorporating age, gender, and race to the single diagnostic threshold. Had we applied the single threshold to all 105 biopsies from patients ≤40 years that our lab interpreted as having SFPN in 2012-2013 using the multivariate model, 75% would have received false negative (normal) diagnoses.
Conclusions: Different models yield contradictory interpretations of the same biopsies. Incorporating demographic covariates improves diagnostic sensitivity, especially for young patients. Repeat biopsies document rapid reduction in epidermal innervation during young adulthood.

doi:10.1016/j.jns.2015.08.1202

1148
WFN15-0824
Neuromuscular Disorders
Clinical spectrum of chronic inflammatory demyelinating polyradiculoneuropathy (cidp) in a chilean pediatric cohort

K. Kleinsteuber[a], M.A. Avaria[b], R. Cortés[a], C.P. Vargas[b], C. Heresi[b], F. Castro[b], X. Varela[a], C. Ferrando[c], S. Tenembaum[d]. [a]*Pediatria y Cirugia Infantil Campus Norte, Universidad de Chile - Clínica Las Condes, Santiago, Chile;* [b]*Pediatria y Cirugia Infantil Campus Nosrte, Universidad de Chile -Hospital Roberto del Río, Santiago, Chile;* [c]*Hospital FUSAT, Neurologia Pediatrica, Rancagua, Chile;* [d]*Clínica de Esclerosis Múltiple Pediátrica, Servicio de Neurología Hospital de Pediatría "Dr. J. P. Garrahan", Buenos Aires, Argentina*

Background: Contrary to adults, CIDP in childhood is an uncommon autoimmune disease (less than200 pediatric cases published).
Objective: To report clinical features, treatment response and long-term outcome in children with CIDP, with emphasis on atypical and refractory cases.
Patients and Methods: Diagnosis of CIDP was established (AAN, ENMC criteria 2002) in 18 children (10 males) with a mean age at diagnosis of 8.8 years (1-18 years), followed since 1999 to 2014.
Results: Clinical presentation: chronic (>8-weeks) symptom-onset in 14(78%), sub-acute(4–8 weeks) in 3(17%) children, with only 1 patient(6%) showing an acute presentation (GBS-like;<4 weeks). Clinical course: relapsing course in 55.6 % (10 children), chronic progressive in 33.3 %(6), and a monophasic profile in only 2 patients. Mean delay in diagnosis was 51 months in chronic progressive group, 19.1 months in relapsing and 3,5 months in monophasic cases. Residual deficits were more frequent in children with chronic progressive disease. Subclinical CNS involvement was observed in two patients. Intravenous corticosteroids and immunoglobulin as monotherapy or combined therapy in relapsing and chronic cases. At last control (mean 6.51 years), 15 (83%) patients were off therapy, showing a favorable outcome: modified Rankin scale score decreased from 3.83 at presentation to 0.61. Children showing relapsing CNS involvement required immunosuppression (rituximab).
Conclusion: An expanding clinical spectrum of CIDP occurs in childhood. Chronic progressive forms may be difficult to distinguish from hereditary neuropathies, accounting for delay in diagnosis and therapy. Children with refractory or atypical forms (CNS involvement) may require aggressive treatment strategies in order to shorten disease duration, improve motor skills, prevent residual deficits, and reduce long-term high-cost therapies.

Patients and Institutional Review Board (IRB) approval were obtained.

doi:10.1016/j.jns.2015.08.1203

1149
WFN15-0178
Neuromuscular Disorders
Serum and muscular kl-6/muc1 are useful biomarker for gne-myopathy

T. Kurashige[a], T. Takahashi[b], Y. Nagano[b], K. Sugie[c], H. Maruyama[b], S. Ueno[c], M. Matsumoto[b]. [a]*Department of Neurology, National Hospital Organization Kure Medical Center, Kure, Japan;* [b]*Department of Clinical Neuroscience and Therapeutics, Hiroshima University, Hiroshima, Japan;* [c]*Department of Neurology, Nara Medical University, Kashihara, Japan*

Introduction: GNE-myopathy is an autosomal recessive myopathy with distal muscle weakness and the formation of rimmed vacuoles (RVs). Mutations in *GNE* result in the decrease of sialic acid that is necessary for glycosylation of MUC1. The extracellular domain of MUC1 has the highly glycosylated tandem repeat domain containing precursor of sialylated carbohydrate antigen KL-6. In this study, we examined KL-6/MUC1 in muscle, serum, and fibroblasts.
Materials and methods: The muscle biopsy specimens and laboratory data of GNE-myopathy ($n = 6$), sporadic inclusion body myositis (sIBM; $n = 12$), polymyositis (PM: $n = 8$), and normal control (NC: $n = 5$) were examined. These specimens were subjected to immunohistochemistry, immunofluorescent technique, and western blot analysis. Fibroblasts from two GNE-myopathy patients cultured with or without ManNAc were also examined by western blot analysis.
Results: In GNE-myopathy, inclusions and RVs were immunopositive for pTDP-43, MUC1 and KL-6, but the sarcolemma was not. On the other hand, the sarcolemma was also immunopositive for MUC1 and KL-6 in sIBM. In PM and NC, the pale immunoreactivity for MUC1 and KL-6 was observed in the sarcolemma and cytoplasm. Western blot demonstrated the decrease of MUC1 and KL-6 in the skeletal muscle of GNE-myopathy. Serum KL-6 levels of GNE myopathy patients were lower than those of other neuromuscular disease patients ($p < 0.05$). Fibroblasts showed the increase of MUC1-C and KL-6 according to ManNAc treatment ($p < 0.03$).
Conclusion: This study suggests that the decrease of KL-6/MUC1 reflects the hypoglycosylation as pathogenesis of GNE-myopathy. Serum and muscular KL-6/MUC1 might be a useful biomarker for GNE-myopathy.

doi:10.1016/j.jns.2015.08.1204

1151

WFN15-0892

Neuromuscular Disorders

Limb-girdle muscular dystrophy due to a novel homozygous ISPD gene mutation disclosed by whole exome sequencing

V. Mastorodemos[a], E. Vogiatzi[b], H. Latsoudis[b], P. Vorgia[c], G. Amoiridis[a], I. Zaganas[a]. [a]*Neurology, University Hospital of Heraklion Crete, Heraklion, Greece;* [b]*Neurology, University of Crete Medical School, Heraklion, Greece;* [c]*Pediatric Neurology, University of Crete Medical School, Heraklion, Greece*

Background: Limb-girdle muscular dystrophies (LGMD) are a group of heterogeneous disorders caused by mutations in several genes, including the *ISPD* gene (Cirak et al, 2013).
Objective: We aimed to describe the successful application of whole exome sequencing (WES) in the diagnostic investigation of a patient with LGMD and her similarly affected sister.
Patients/methods: The proband, a 19 year-old female, started having gradually worsening muscular weakness and walking difficulty at the age of 10 years. On examination, scapular winging, calf hypertrophy, scoliosis, wadding gait, muscular weakness in a limb-girdle distribution, impaired respiratory function and markedly decreased deep tendon reflexes were noted. Electromyographic studies were suggestive of myopathy and serum creatine kinase levels were elevated. The patient's 14 year-old sister presented with similar clinical features, albeit milder, whereas both parents were unaffected. The patient had been subjected to numerous studies which were non-diagnostic. After informed consent, WES was performed with a mean coverage of 61.8X. Variant calling and analysis was performed using the GenomeTrax 2015.1 (Biobase) software, followed by manual annotation of pathogenic variants.
Results: The 712A > G change, leading to the Thr238Ala amino acid substitution, was found in the *ISPD* gene in homozygous state. These results were verified by Sanger sequencing, which also showed the same amino acid change in the affected sister, again in homozygous state.
Conclusions: This report is an example of successful application of a WES approach for the diagnostic investigation of a patient with LGMD. Furthermore, this report expands further the genotypic and phenotypic variability of ISPD-related LGMD.

doi:10.1016/j.jns.2015.08.1205

1152

WFN15-1554

Neuromuscular Disorders

Potential risk of an outbreak of guillain-barre syndrome? Epidemiological analysis of 4,796 hospital discharged cases in Chile

D. Valenzuela[a], P. Zitko[b], J.M. Matamala[c], P. Lillo[a]. [a]*Departamento de Neurología Sur, Universidad de Chile, Santiago, Chile;* [b]*Unidad de Estudios Asistenciales, Hospital Barros Luco, Santiago, Chile;* [c]*Departamento de Ciencias Neurológicas Oriente, Universidad de Chile, Santiago, Chile*

Background: To date, population-based studies investigating potential outbreak of Guillain Barre (GB) Syndrome are scarce and reported contradictory findings. The aims of our study were: (1) to identify the general trend of hospital-discharged cases of GB between 2001-2009, (2) to determine the existence of within-year seasonality, and (3) to identify any outbreak occurred in that period.
Methods: Number of cases of GB was extracted from National Registry of Hospital Discharge. The registry has national public and private coverage, and includes primary diagnosis of discharge coded by ICD-10 criteria. Case analysis was performed using quasipoisson spline-cubic regression model. Several sensitive analyses were made using different criterions of discharge.
Results: 4,796 cases of GB discharge were recorded during the analyzed period. The statistical model showed an general trend of increasing incidence of GB cases, higher in 2001-2002 and 2007-2009. Seasonality analysis evidenced significantly a higher number of cases in summer period (January to March) and lower number of cases in spring period (RTi 0.79 [0.63 – 0.99] September compared with January). Between January and March of 2005 was observed a significant increase of cases over the expected cases ($p < 0.05$). Sensitive analysis not modified general findings.
Conclusions: Trend of hospital discharge of GB have increased the last years. Cases are more frequent in summertime, and outbreak of cases has been detected. Our results demonstrate cyclicality, seasonality and risk of outbreaks of GB, although health impact may be controversial.

doi:10.1016/j.jns.2015.08.1206

1153

WFN15-1289

Neuromuscular Disorders

Safety profile and pharmacological peculiarities between preparations of botulinum toxin for treatment of blepharospasm

R.R. Pacheco Silva[a], T.N. Borges Silva[a], V. Morais[b], H.H.S. Matozinho[a], L.C. Morais[a], M.A. Bannach[a], F.H. Rodrigues da Silva[a], J.E.S. Cavalcante[c], D. José da Silva[b]. [a]*Internal Medicine Department, Clinics Hospital Federal University of Goias, Goiânia, Brazil;* [b]*Neurology Department, Clinics Hospital Federal University of Goias, Goiânia, Brazil;* [c]*Neurosurgery Department, Clinics Hospital Federal University of Goias, Goiânia, Brazil*

Background: Blepharospasm, a focal dystonia expressed by involuntary contractions of the periocular muscles, leads to forced eye closure and limitation of the ordinary eyelid movement. In 1989 botulinum toxin type A (NTBo-A) was approved for treatment of blepharospasm by US FDA, and in 1994 in Europe. Previous therapy was surgical, but it became obsolete, since NTBo-A is effective and free of postoperative complications.
Objective: Correlate doses of NTB with possible adverse effects considering the dose-term relationships and adverse effect profiles.
Materials and methods: A search was performed in PubMed using "safety" AND "botulinum toxin" AND "treatment of blepharospasm", including all kinds of articles made over the last 5 years in humans. 4 of 12 articles were selected for the highest level of evidence, besides the "Manual of Botulinum Toxin Therapy".
Results: The severity and duration of adverse effects of NTB are dose dependent. No adverse effects were reported to the central nervous system. Dysport had more adverse effects than Botox, probably due to the stronger diffusion of Dysport. Considering the conversion factor 1: 1, the profiles of adverse effects of Xeomin and Botox seem identical. Botox and Xeomin in high doses rarely cause systemic adverse effects. Dysport at doses higher than 1500 UC can lead to systemic motor effects. NeuroBloc / Myobloc can cause systemic autonomic adverse effects at doses of 4000 UC.
Conclusion: Despite the good tolerability, NTB initial dose should be moderate until the sensitivity of the patient is known.

doi:10.1016/j.jns.2015.08.1207

1154

WFN15-0457

Neuromuscular Disorders

Renal dysfunction is common in myotonic dystrophy

T. Matsumura, T. Saito, H. Fujimura, S. Sakoda. *Neurology, National Hospital Organization Toneyama National Hospital, Toyonaka, Japan*

Background: Renal dysfunction is often overlooked in patients with Neuromuscular Disorders (NMD) since creatinine keeps low values due to amyotrophy.
Objective: To assess renal function of NMD patients, we made a retrospective study using cystatin C (CysC), which is not influenced by muscle volume.
Patients and methods: Subjects were 563 NMD patients including 31 congenital muscular dystrophy (CMD), 155 Duchenne muscular dystrophy (DMD), 114 other dystophinopathies (Dys), 121 myotonic dystrophy (DM), 82 other muscular dystrophies (MD) and 60 motor neuron diseases (NMD). Patients' profiles, laboratory and ultrasound cardiogram data were collected from medical records and statistical analyses were done. I have obtained institutional review board approval, as necessary.
Results: CysC was elevated (>0.9 mg/L) in 0 CMD, 14 DMD, 12 Dys, 28 DM, 6 MD and 15 MND patients, respectively. Logarithm of CysC (lgCysC) was correlated to age and lower in female patients. After adjustment of age and sex, lgCysC was higher in DM compared to CMD, Dys, MD and MND. After adjustment of age in male patients, lgCysC was also higher in DM compared to DMD. In DM, LgCys was correlated to age, CTG repeats number, logarithm of creatine kinase, logarithm of cardiac troponin T (lgTnT) and triglyceride (TG). After adjustment of CTG repeats, age, lgTnT, TG and hemoglobin A1c were associated to lgCysC.
Conclusion: Chronic kidney disease should be considered as a complication in DM. Although further studies are needed to elucidate the pathomechanism, DM itself, subclinical cardiac damage and metabolic dysfunction might have influences on renal function.

doi:10.1016/j.jns.2015.08.1208

1155

WFN15-0846

Neuromuscular Disorders

Poems syndrome. Differential diagnosis in a refractory polyneuropathy. A case report

D. Vilaça Egídio Souza Lima[a], D. Dayane Cordeiro Martins[a], T. Michel Dos Santos[a], J. Azevedo Santos Pacheco[a], A. Aguiar Souza Costa[a], M. Andrée Morel Téliz[a], M. Couy Fonseca[a], T. Hipólito Santos[a], A.V. Cunha Martins[b], A. Gonçalves De Oliveira[b], R. Santiago Gomez[a]. *[a]Neurology, Madre Teresa Hospital, Belo Horizonte, Brazil; [b]Hematology, Madre Teresa Hospital, Belo Horizonte, Brazil*

POEMS syndrome (polyneuropathy, organomegaly, endocrinopathy, M protein, and skin changes) is a rare condition that affects several organs. Peripheral neuropathy and monoclonal plasmaproliferative disorder are the most important characteristics. The clinical course is slow and the diagnosis, difficult. Multiple Myeloma and Chronic Inflammatory Demyelinating Polyneuropathy are some of the differential diagnosis. There is no pathognomonic diagnostic test. The monoclonal disorder, represented by the presence of the M protein, almost always, the lambda light chain, is evidenced by serum or urine immunofixation. Treatment depends on the clinical manifestations and there is no gold standard. This study reports a case of a female patient, with sensitive polyneuropathy symmetrical in lower and upper limbs, as well as arreflexia and gait alterations. At the electromyographic studies, the results showed a pattern of demyelinating polyneuropathy. The diagnostic hypothesis of CIPD (chronical inflammatory demyelinating polyneuropathy) was suggested and treatment was initiated with corticosteroids and immunosuppressors. After 3 treatment cycles, the patient still presented the symptoms as well as other manifestations, such as hyperpigmentation, hematologic alterations, hepatomegaly and pleural effusion. The specific diagnostic procedure evidenced VEGF 1000 pg/ml (NR: 31-86 pg/ml) and multiple kappa and lambda bands in 24-hour urine immunofixation. It was diagnosed as POEMS and the treatment with chemotherapy was initiated with satisfactory decrease on the progression of the disease, but little decrease on the clinical picture.I have obtained patient and/or Institutional Review Board (IRB) approval, as necessary.

doi:10.1016/j.jns.2015.08.1209

1156

WFN15-1472

Neuromuscular Disorders

Elevated serum levels of heat-shock protein (HSP) 70 and 90 in patients with ALS

D. Miyazaki[a], A. Nakamura[b], C. Kobayashi[a], T. Kinoshita[a], A. Hineno[a], K. Yoshida[c], S. Ikeda[a]. *[a]Department of Medicine (Neurology and Rheumatology), Shinshu University School of Medicine, Matsumoto, Japan; [b]Intractable Disease Care Center, Shinshu University Hospital, Matsumoto, Japan; [c]Department of Brain Disease Research, Shinshu University School of Medicine, Matsumoto, Japan*

Background: Recently, heat-shock protein (HSP) chaperones have been associated with the pathogenesis of motor neuron diseases, including familial ALS resulting from a mutation in the *Cu/Zn superoxide dismutase* (*SOD*) *1* gene. HSPs act as molecular chaperones for protein folding, transport, and the formation of structures essential for cell survival.
Objective: Heat-shock proteins (HSPs) have recently been implicated in ALS pathology. Thus, we examined serum levels of three representative HSPs - HSP27, HSP70, and HSP90 - in ALS patients to determine whether they vary systematically.
Patients and methods: Subjects were 58 patients with ALS and 85 healthy controls. Of the 58 patients with ALS, 39 had limb-onset ALS and 19 had bulbar-onset ALS. Serum HSP27, 70, and 90 levels were determined using enzyme-linked immunosorbent assay (ELISA) methods.
Results: Levels of serum HSP70 (3.47 ± 2.59 ng/mL) and HSP90 (17.79 ± 10.83 ng/mL) in ALS patients were significantly higher than those of controls (1.02 ± 0.64 ng/mL; $P < 0.0001$ and 12.70 ± 9.23 ng/mL; $P = 0.0038$, respectively), whereas serum levels of HSP27 did not differ significantly. Further, serum HSP70 and 90 levels in ALS patients were consistently higher than those of controls, even at the late stage of disease.
Conclusion: The function of HSPs in patients with ALS may prolong throughout the course of disease. HSP70 and HSP90 might be regulatory molecules that modify disease pathology by maintaining protein misfolding in ALS.

doi:10.1016/j.jns.2015.08.1210

1158

WFN15-1599

Neuromuscular Disorders

Assessment of exercise capacity over 6 months in identical twins

with late-onset pompe disease, with and without enzyme replacement therapy

J. Muñoz-Blanco[a], I. Catalina-Álvarez[a], M.R. Jiménez-Bautista[a], I. Bretón-Lesmes[b], A. Traba-López[c]. [a]*ALS-Neuromuscular Unit Neurology, Hospital Gregorio Marañón. IiSGM, Madrid, Spain;* [b]*Nutrition Unit Endocrinology, Hospital Gregorio Marañón. IiSGM, Madrid, Spain;* [c]*Clinical Neurophysiology, Hospital Gregorio Marañón. IiSGM, Madrid, Spain*

Background: Pompe disease is a rare, autosomal recessive disorder caused by deficiency of acid alpha-glucosidase. The effects of ERT on strength, motor function, pulmonary and cardiac status, and quality-of-life measures in late-onset Pompe patients, at varying degrees of disease severity, need to be more fully documented.
Objective: Assess differences in the clinical course, with and without ERT for 6 months follow-up, of identical twins with late-onset Pompe disease.
Patients and Methods: Identical twins, 50 years old males, with heterozygous mutation (IVS1 -13 T > G; p.D645Y) in GAA gen. Onset of symptoms at 33 years with exercise intolerance, myalgias, orthopnea, pelvic girdle and axial weakness, without significant clinical differences between them. One needs NINV two months before ERT (Case A). After informed consent, we initiate a 6 months follow-up, bi-weekly, one case with ERT (algluosidase_alfa), 20 mg/kg/bi-weekly, the other with medical monitoring (Case B) by FVC (sitting_lying), 6MWT, composite MRC, hand grip, both sides, and CPK levels.
Results: No adverse effects in both.
Baseline, 6th month determination: FVCsitting (A: 84%, 85%/B: 88%, 87%); FVClying (A: 49%,65%/B: 49%, 48%); 6MWT-m (A: 556,705/B: 576,598); Grip (kg) right (A: 32, 55/B: 35, 37); Grip (kg) left (A: 29, 49/30, 28); composite-MRC (A:100, 110/B: 100, 100); CPK (U/L) (A: 530, 416/B: 550, 568). The treated case showed a significant improvement in FVClying (+16%) and the difference between FVCsitting-lying (<15%), hand grip with both hands (+71% right, +69% left) and 6MWT (+26,7%). The untreated patient remained stable.
Conclusion: ERT patient showed significant functional improvement over the case untreated, clinically and genetically identical.

doi:10.1016/j.jns.2015.08.1211

1159

WFN15-0760

Neuromuscular Disorders

Early detection of mononeuritis multiplex & diagnosis of systemic diseases thru electrophysiological work out with polyneuropathy as preceeding symptom

B. Mutluay[a], A. Koksal[a], N. Karagoz[a], F. Aysal[b], S. Baybas[a], A. Soysal[a]. [a]*Neurology, Bakirkoy Research and Training Hospital for Psychiatry Neurology and Neurosurgery, Istanbul, Turkey;* [b]*Neurology, Medipol University, Istanbul, Turkey*

Background: Mononeuritis multiplex (MNM) is a nervous system disorder that involves damage to at least two separate peripheral nerves. It is a syndrome not a disease, caused by certain systemic diseases like diabetes, vasculitis, rheumatic, infectious or paraneoplastic diseases.
Objective: To evaluate the role of electrophysiological work out on patients presenting with polyneuropathy as preceding symptom that leads to early diagnosis of MNM and an underlying systemic disease.
Patients: We retrospectively analyzed 12 MNM patients (4 females and 8 males from 19 to 62 years of age) presenting with patchily distributed weakness in all and pain at onset in nine, at our neuromuscular diseases clinic between 1993-2013. We have obtained Institutional Review Board (IRB) approval, as necessary.
Methods: Neurophysiological evaluation, routine blood chemistry, vasculitis markers, serum and protein electrophoresis, HIV, Hepatitis markers were examined in all patients. Nerve and muscle biopsies were performed in 5 patients.
Results: Neurophysiological evaluation revealed an asymmetrically distributed motor and sensory nerve involvement accompanied by neurogenic findings in all. Nerve and muscle biopsies were performed in five. The differential diagnostic work up of this patient group resulted in diagnosis of 2 Churg- Strauss syndrome, 2 rheumatoid arthritis, 2 non-necrotizing vasculitis, 2 PAN and 1 multiple myeloma, 1 CNS vasculitis related to p-ANCA, 1 Hepatitis C and 1 HIV.
Conclusion: Detailed investigation of patients with polyneuropathy as preceding symptom thru electrophysiological work out can be a valuable tool that leads to early detection and treatment of MNM and the underlying systemic disease.

doi:10.1016/j.jns.2015.08.1212

1160

WFN15-1196

Neuromuscular Disorders

First evaluation of efficacy and safety of intravenous immunoglobulin (ivig) treatment of dysimmune small-fiber predominant polyneuropathy (sfpn)

R. Treister[a], X. Liu[a], M. Lang[a], K. O'Neil[a], A.L. Oaklander[b]. [a]*Neurology, Massachusetts General Hospital Harvard Medical School, Boston, USA;* [b]*Neurology Neuropathology, Massachusetts General Hospital Harvard Medical School, Boston, USA*

Background: IVIG effectively treats autoimmune large-fiber neuropathies but it is untested for SFPN, which usually causes chronic widespread pain and/or dysautonomic symptoms. However, some SFPN patients appear to have autoimmune causality and receive IVIG empirically.
Objective: To retrospectively evaluate efficacy and safety of IVIG for treating SFPN.
Patients and Methods: Ethical permission for medical-record review was obtained. Inclusion criteria comprised physician's impression of SFPN plus confirmation by nerve biopsy, PGP9.5-immunolabeled distal-leg skin biopsy, or autonomic function testing (AFT). Autoimmune attribution required other autoimmune diagnoses or abnormal serologies, plus comprehensive exclusion of other causes. Inclusion required pre-treatment pain ≥ 3/10 and ≥ one IVIG dose of 2 grams/kg/4 weeks. Outcomes included changes in pain scores (2-tailed, paired t-test analysis) and AFT interpretation (chi-square), plus patients' Global Impression of Change (PGIC, 1-7 scale).
Results: 31 patients met inclusion criteria, all Caucasian; 81% female, and on average 43.6 ± 17.5 years old (14-71y). Treatment duration averaged 84.2 ± 81.1 weeks (5-285w). Their baseline pain of 6.2 ± 1.7 became 5.1 ± 2.3 during treatment ($p = 0.059$). Their 26 AFT results were 73% abnormal at baseline vs. 52% during

treatment ($p = 0.070$). Their 22 PGIC scores showed that 64% improved; 18% worsened. Among the 8/31 (26%) IVIG-responders (>30% pain reduction), pain dropped from 7.1 ± 1.6 to 3.2 ± 2.3, and half of their universally abnormal baseline AFTs normalized. 40% reported PGIC improvement. Infusion reactions were typical and manageable, including one hemolytic anemia and several vein thromboses.

Conclusion: This preliminary evidence of IVIG efficacy and safety in select SFPN patients provides rationale and effect sizes for larger studies.

doi:10.1016/j.jns.2015.08.1213

1161

WFN15-1316

Neuromuscular Disorders

Muscular dystrophy clinical trial network: establishment and promotion of clinical research for neuromuscular diseases in Japan

K. Ogata[a], R. Shimizu[b], E. Takeshita[c], A. Tamaura[b], E. Kimura[b], H. Komaki[d]. [a]*Institute of Clinical Research / Department of Neurology, National Hospital Organization Higashisaitama Hospital, Hasuda, Japan;* [b]*Translational Medical Center, National Center of Neurology and Psychiatry, Kodaira, Japan;* [c]*Department of Child Neurology, National Center of Neurology and Psychiatry, Kodaira, Japan;* [d]*Department of Child Neurology / Department of Clinical Research Promotion, National Center of Nseurology and Psychiatry, Kodaira, Japan*

Background: Muscular dystrophy is a rare disease, affecting less than 0.01% of the population. It has been pointed out that the establishment of clinical trial network among medical institutes is beneficial to improve trial readiness for rare diseases like muscular dystrophy. Some networks for clinical research of neuromuscular diseases are already established in the world.

Objective: Establishing clinical trial network for neuromuscular diseases to promote and activate clinical research for rare diseases in Japan.

Methods: Muscular Dystrophy Clinical Trial Network (MDCTN) was organized based on the study group for clinical myology funded by the Japanese national research grant, and the network of national hospitals with the wards for progressive Neuromuscular Disorders.

Results: Thirty-three medical institutions joined this network. The annual site registry queries revealed that approximately 6,000 patients with neuromuscular diseases are visiting to the member hospitals. We work on sharing updated health care information and standardized evaluations through workshops. Working patient registry closely is one of the keys of this network. Collaborating with patient registry, we were able to recruit participants with Duchenne muscular dystrophy who has specific mutation and condition for remarkable short duration.

Conclusion: Our goal is to be a model of pharmaceuticals and medical devices development for rare diseases in Japan and perform clinical trial based on ICH-GCP using this network.

doi:10.1016/j.jns.2015.08.1214

1162

WFN15-1307

Neuromuscular Disorders

Bulbar presentation of myasthenia gravis with positive anti acetylcholine receptor antibody

R.S. Gomez[a], J.A.S. Pacheco[a], D.V.E.S. Lima[a], D.D.C. Martins[a], J.C.C. Martins[a], A.A.S. Costa[a], M.A.M. Téliz[a], M.C. Fonseca[a], T.M. Santos[a], T.H.S. Silva[a], T.E.R. Braga[b]. [a]*Neurology Department, Madre Teresa Hospital, Belo Horizonte, Brazil;* [b]*Phonoaudiology Department, Madre Teresa Hospital, Belo Horizonte, Brazil*

Introduction: Myasthenia Gravis is an autoimmune disorder with a fluctuating course. The immunologic hallmark is the presence of antibody against acetylcholine receptors at the postsynaptic membrane of the neuromuscular junction. Approximately 15% present with bulbar symptoms: dysarthria, dysphonia, dysphasia and chewing fatigability.

Objectives: Describe a bulbar presentation of myasthenia gravis with positive anti-acetylcholine receptor antibody (anti-ACh-R).

Methods: A 73-year old female was admitted with dysphonia, nasal speech, nasopharyngeal regurgitation of liquids, progressive dysphagia and dyspnea. Neurological exam showed rhinolalia, chewing fatigability and severe dysphagia. Global strength was normal, except for light facial palsy. Videofluoroscopy detected oropharyngeal dysphagia with silent aspiration. The repetitive stimulation test on trapezius muscle done 20 days before admission it was normal. Thorax scan showed no alterations of the thymus. On laboratory test, binding acetylcholine receptor antibody was positive 16,9 mmol/L (<0,2 mmol/L). Patient showed significant improvement of deficits after treatment with pyridostigmine and prednisone.

We have obtained patient and/or Institutional Review Board (IRB) approval, as necessary.

Conclusion: The present case above is not a common presentation. A solely bulbar myasthenia gravis without appendicular muscle weakness and positive anti-ACh-R. She had a good response to immunosuppressant and progressive improvement was seen one month later.

doi:10.1016/j.jns.2015.08.1215

1165

WFN15-0764

Neuromuscular Disorders

Clinical and genetic characterization of Uruguayan patients suffering from muscular pathology of unknown etiology. Preliminary results

A. Perna[a], H. Hackembruch[a], C. Vazquez[a], R. Guecaimburu[b], R. Rozada[a], M. Legnani[a], J.R. Higgie[a], J.M. Marques[c], L. Repetto[c], L. Guggeri[c]. [a]*Neurología, Instituto de Neurología, Montevideo, Uruguay;* [b]*Genetica, Facultad de Medicina, Montevideo, Uruguay;* [c]*Biología Molecular, Laboratorio GENIA, Montevideo, Uruguay*

Introduction: Limb girdle muscular dystrophies (LGMD) is a heterogeneous group of muscle diseases that may have the same phenotype. The late-onset Pompe disease may have the same clinical manifestations.

Objectives: To clinically and genetically characterize a group of patients with myopathic syndrome of unknown etiology.

Methodology: A cross-sectional study was performed.

Inclusion criteria: Patient with an aged between 14y and 65y, resident of the Republic of Uruguay with a myopathic syndrome of unknown etiology.

Firstly the Dried blood spot test as a screening test for Pompe disease was applied to every patient, if positive dry drop confirmatory genetic testing for Pompe took place.

Patients with negative genetic test had blood taken for DNA extraction, was quantified by real-time PCR and amplified by the pool of primers for dystrophy (LGM2B, LGMD2A, LGMD1C, LGMD2D, LGMD2E, LGMD2F, LGMD2C, LGMD2I, LGMD1G, LGMD2L) This genes

were selected because of the frequency and epidemiology of the region.

Results:

18 patients were included, all with phenotype of LMGD.

2 patients had positive dry drop with genetic confirmation for Pompe disease.

2 patients had the gene mutation for dysferlin (LGM2B).

1 patient presented mutation to HNRPDL (LGMD1G).

1 patient presented to SGCA mutation of unknown significance.

12 patients had negative dry drop and were negative for mutations explored.

Conclusion: This study allowed the first two cases diagnose as a treatable genetic myopathy as Pompe disease. The genetic panel for dystrophies above was used by a Uruguayan laboratory for the first time in the country.

doi:10.1016/j.jns.2015.08.1216

1166

WFN15-1413

Neuromuscular Disorders

Brain sonography insight into the midbrain and basal ganglia in myotonic dystrophy type 2

V. Rakocevic-Stojanovic[a], S. Peric[a], D. Savic-Pavicevic[b], J. Pesovic[b], D. Lavrnic[a], Z. Jovanovic[a], A. Pavlovic[a]. [a]*Department for Neuromuscular Disorders, Neurology Clinic Clinical Centre of Serbia, Belgrade, Serbia;* [b]*Center for Human Molecular Genetics, Faculty of Biology School of Medicine University of Belgrade, Belgrade, Serbia*

Aim: To analyze transcranial sonography (TCS) findings in genetically confirmed myotonic dystrophy type 2 (DM2) patients.
Methods: Study comprised 40 DM2 patients and 38 sex- and age-matched healthy controls (HCs). TCS was performed through the preauricular acoustic bone window.
Results: Hyperechogenic SN was found in 20% of DM2 patients compared to 3% of HCs. Brainstem raphe (BR) hypoechogenicity was more common in DM2 patients compared to HCs (56% vs. 10%, $p < 0.01$) and it was more common in patients with depressiveness, fatigue and excessive daytime sleepiness ($p < 0.05$). Diameter of the third ventricle (DTV) was increased in DM2 patients compared to HCs (5.8 ± 1.7 vs. 5.1 ± 1.0 mm, $p < 0.05$).
Conclusions: Finding of BR hypoechogenicity might have clinical implication because of the potential responsivity to serotonin-reuptake inhibitors. Furthermore, TCS revealed certain alterations in brain structures previously not seen in MRI studies.

doi:10.1016/j.jns.2015.08.1217

1167

WFN15-0755

Neuromuscular Disorders

Secondary and tertiary endpoints in clinical trials for neuromuscular/neurodegenerative diseases: a descriptive analysis

C. Robinson[a], N. Heath[b], A. Aiello[a], Z. Devecseri[a]. [a]*Global Medical Affairs, Genzyme, Cambridge, USA;* [b]*Pharmacy Student, MCPHS University, Boston, USA*

Background: Various endpoints are used to evaluate the efficacy of treatments for neuromuscular/neurodegenerative disorders. No consensus exists in regards to which endpoints most accurately demonstrate a treatment's effect on muscle function.
Objective: To determine what secondary and tertiary endpoints are most commonly evaluated by investigators, therefore most important in neuromuscular/neurodegenerative disease trials. Primary endpoints were evaluated in a previous review.
Methods: We searched Clinicaltrials.gov between 12/1/14 and 1/26/15 to identify studies conducted in: Amyotropic Lateral Sclerosis (ALS), Duchenne Muscular Dystrophy (DMD), Huntington's disease (HD), Neuromuscular Disease (other), Pompe disease (PD), and Spinal Muscular Atrophy (SMA).

- Inclusion criteria: interventional studies; started after year 2000; phases 2-4
- Exclusion criteria: safety/tolerability studies; status was not active

Results: Condition (n, trials) – Most frequent endpoint (n), etc.

- ALS (63) – ALSFRS-R score (20), FVC (19), AEs (11), MMT (10)
- DMD (19) – NSAA (6), Muscle biopsy (5), Muscle strength (5), Safety (5)
- HD (24) – UHDRS-TFC (5), CGI score (4), UHDRS-TMS (3)
- SMA (11) – FVC (4), MUNE (4)
- PD (9) – FVC (3), LVM z-score (2), 6MWT (2)
- Other (62) – Tolerability (8), Short Form 36 (7), 6MWT (6)

Conclusion: There is very little consistency with any endpoints studied in neuromuscular/neurodegenerative clinical trials. Therefore, it is difficult to compare the efficacy of treatments, due to the variety of evaluations conducted. Guidelines should be developed to determine the most relevant endpoints to study in neuromuscular clinical trials.

Since this was a review, sponsor companies were responsible for IRB approval for their individual studies.

doi:10.1016/j.jns.2015.08.1218

1168

WFN15-0427

Neuromuscular Disorders

Pompe disease in Uruguay. The first case in an adult genetically confirmed

R. Rozada Favotto, H. Hackembruch, A. Perna, L. Urban, J.R. Higgie, M. Legnani, R. Guecaimburu, C. Vazquez. *Enfermedades Neuromusculares, Instituto de Neurología, Montevideo, Uruguay*

Background: Pompe disease, also known as type II glycogenosis, is a progressive autosomal recessive glycogen storage disease caused by a deficiency of lysosomal acid-a-glucosidase (GAA), primarily in skeletal and cardiac muscle, and by defects in autophagy, with an age of onset ranging from infancy through adulthood.

In adult onset the typical presentation is with a limb girdle dystrophy pattern (that engaged especially the hip girdle) or dyspnea secondary to diaphragm weakness.

A simple blood-based assay to measure the level of α-glucosidase activity, like dried blood spot test, is the optimal initial test and is needed a second test to confirm the disease (alpha- glucosidase activity in cultured fibroblast or muscle tissue or by genetic testing).
Objective: We describe our first case of adult onset Pompe disease in Uruguay.
Results and conclusion: 54 years female with a limb girdle myopathy syndrome with hip girdle involvement, hypoacusia and diffuse hyporreflexia. CK was 528 and electromyography reveals spontaneous activity and myopathic potentials. Against the

possibility of a Pompe disease we performed a dried blood spot test that demonstrated to low level of α-glucosidase activity. A genetic test confirmed the diagnostic.

An early diagnosis of Pompe disease will improve patient outcomes as care standards including enzyme replacement therapy can be applied and complications can be anticipated.

The introduction of enzyme replacement therapy for GAA deficiency using recombinant human GAA (rhGAA) changed the course of the disease with an improvement especially in infantile forms but also in late onset Pompe disease.

doi:10.1016/j.jns.2015.08.1219

1169

WFN15-0569

Neuromuscular Disorders

The importance of the connections between face recognition and auditory memory cortical areas in young duchenne muscular dystrophy patients

A.F. Secaf, J.N.B. Martins, M.S.O.M. Sawan, A.J. Godoy. *Neurology, Faculty of Health Sciences of Barretos, Barretos, Brazil*

Background: Several reports discuss cognition in Duchenne muscular dystrophy (DMD) patients.
Objective: We focus on visual and auditory memory in different ages.
Patients and Methods: Seven DMD patients were tested. They gave proper approval. We evaluated visual memory showing 5 images of people with no facial expression (NE) with different characteristics; 5 images of people with facial expressions (FE); thirdly they heard common sounds; and then visual plus auditory stimuli. After each test, 3 questions were made, considering a facial characteristic or order of appearance. The maximum value of each test was 3, and of the combined 4 tests 12.
Results: We considered DMD patients 5 to 7 years (Younger Group: YG) and All Patients (AP), 5 to 28 years. The NE test presented average of 1.7 for AP and YG while the FE test 1.3 for AP and 1.0 for YG. Test of auditory memory got 1.3 for AP and 0.75 for YG. Visual test made after visual stimuli followed by auditory stimuli showed an average of 2 for AP and 1.5 for YG.
Conclusion: The YG patients got lower scores when memory for face was tested after activation of the auditory memory as well as when checked their memory of faces expressing emotions. However their NE test presented the same score when compared to AP. Our results suggest young DMD patients may have a relatively poor activation of the limbic system. They also emphasize the importance of auditory memory and face recognition areas connections as years go by.

doi:10.1016/j.jns.2015.08.1220

1170

WFN15-0054

Neuromuscular Disorders

Dysphagia in acute inflammatory neuropathy

Y. Seçil[a], T. Mengi[a], T.K. İncesu[a], Z.O. Akkiraz[a], S. Arıcı[a], N. Gürgör[a], C. Ertekin[b], M. Gedizlioğlu[c]. *[a]Neurology, Izmir Katip Çelebi University Ataturk Education and Research Hospital, Izmir, Turkey; [b]Neurology, Ege University Medical School Hospital Neurophysiology Department, Izmir, Turkey; [c]Neurology, İzmir Education and Research Hospital, Izmir, Turkey*

Background: Acute infammatory neuropathy or Guillain–Barré syndrome (GBS) may cause many complications during course of the disease. Dysphagia in GBS is reported 40%.
Objective: Our aim in this study is to evaluate dysphagia in GBS patients using simple electrophysiological methods and to detect obvious and subclinical dysphagia.
Material and Methods: Eighteen GBS patients and 18 normal controls (NC) were included in the study. All patients were questioned about dysphagia complaint and were neurologically examined and cranial nerve findings were recorded. Dysphagia limit (DL) and sequential water swallowing (SWS) tests were used for evaluation of deglutition. Cardiac rhythm, respiration and sympathetic skin responses (SSR) were synchronously recorded.
Results: Dysphagia was found in 11/18 (61.1 %) of GBS patients. Mean DL was 16.3 ± 9.1 mL in GBS group. In NC group DL was normal ($DL > 20$ ml). In SWS, mean swallowing time was significantly increased compared to NC group ($p < 0.05$). Cardiac rhythm was found to be accelerated during swallowing apnea in all groups. Swallowing related SSR occurred in 94.4% of NC group and in 72.2% of GBS patients.
Conclusion: Although frequently overlooked, GBS may cause dysphagia. In our series, clinical dysphagia was 61.1%, subclinical dysphagia was 38.9 %. Even they have no complaint, their DL test was abnormal. They had better to be examined by electrophysiological methods to evaluate dysphagia. If we become aware of subclinical or clinical dysphagia in GBS patients, we can prevent aspiration pneumonia and complications.

doi:10.1016/j.jns.2015.08.1221

1171

WFN15-1173

Neuromuscular Disorders

Spinal muscular atrophy type 2, a case report

B. Sgavioli Massucato, R.C. Cognette, L.C. Barroti, A.J. Godoy. *Neurology, Faculty of Health Sciences of Barretos, Barretos, Brazil*

Spinal Muscular Atrophy Type 2 is a neurodegenrative disease caused by the deletion of SMN_1 gene (gene 1 of motor neuron survival), located at chromossome 5. From an autosomal recessive genetic inheritance, the changes of this gene leads to a SMN_1 proteins levels reduction. As a consequence, there is an irreversible motor neurons alpha degeneration. Clinically, the lack of this protein leads to hypotonia and paresthesia, symptoms started usually on childhood. The definitive diagnosis can be done through genetic investigation, from the complete absence of exon 7 from SMN_1 gene. This condition does not improve with known pharmacologic treatment, although supportive therapy could postpone and improve the patient's quality of life. On this case report, the family of a three-years old girl searched for IDN ("Institute of Neuromuscular Diseases") in Barretos, Brazil. Their intention is to have their child being assisted for the Spinal Muscular Atrophy Type 2, previously diagnosed two years ago, through genetic investigation. The symptoms were first noticed back when she was six months old, with a difficulty to keep seated. On her first pediatrics appointments, the modifications were characterized as normal; however, the parents inquired after alternative treatment methods for the health condition of their child, who presented many respiratory pathologies and crippling muscular atrophy.

doi:10.1016/j.jns.2015.08.1222

1172

WFN15-0012

Neuromuscular Disorders

Whole-body muscle mri in hyperkalemic periodic paralysis

H. Shin[a], Y. Lee[b], H. Lee[a], H. Lee[a], S. Han[b], Y. Choi[a], S. Kim[a]. [a]*Neurology, Yonsei University College of Medicine, Seoul, Korea;* [b]*Radiology, Yonsei University College of Medicine, Seoul, Korea*

Hyperkalemic periodic paralysis (hyperKPP) is an autosomal dominant muscle sodium ion channelopathy characterized by recurrent paralytic attacks. A proportion of affected individuals develop fixed or chronic progressive weakness, resulting in significant disability. However, little is known about the pathology of hyperKPP-induced fixed weakness, including the pattern of muscle involvement. To address this question, we performed and analyzed whole-body muscle magnetic resonance imaging (MRI) in seven hyperKPP patients and quantified muscle fat infiltration, which is suggestive of chronic progressive myopathy, by the two-point Dixon technique. Our results revealed muscle atrophy and fatty infiltration in hyperKPP patients, especially in older individuals. Muscle involvement followed a selective pattern, primarily affecting the posterior compartment of lower leg and anterior thigh muscles. Muscle fat fraction increased with patient age in the anterior thigh ($r = 0.669$; $p = 0.009$), in the deep posterior compartment of the lower leg ($r = 0.617$; $p = 0.019$), and in the superficial posterior compartment of lower leg ($r = 0.777$; $p = 0.001$). Thus, our whole-body muscle MRI findings reveal evidence for chronic progressive myopathy in hyperKPP patients. Further, our data suggest that a selective pattern of muscle involvement, affecting the posterior compartment of lower leg and the anterior thigh, is characteristic of chronic progressive myopathy in hyperKPP.

doi:10.1016/j.jns.2015.08.1223

1173

WFN15-0041

Neuromuscular Disorders

Targeted next-generation sequencing for the genetic diagnosis of dysferlinopathy

H. Shin[a], H. Jang[b], H. Park[c], J. Lee[a], S. Kim[a], Y. Choi[a], J. Lee[d]. [a]*Neurology, Yonsei University College of Medicine, Seoul, Korea;* [b]*Chemistry, Yonsei University, Seoul, Korea;* [c]*Neurology, Mokdong Hospital Ewha Womans University College of Medicine, Seoul, Korea;* [d]*Oral biology, Yonsei University College of Dentistry, Seoul, Korea*

Background: Dysferlinopathy comprises a group of autosomal recessive muscular dystrophies caused by mutations in *DYSF* gene. Due to the large size of the gene and its lack of mutational hot spots, analysis of *DYSF* gene is time-consuming and laborious using conventional sequencing methods. By next-generation sequencing (NGS), *DYSF* gene analysis has previously been validated through its incorporation in multi-gene panels or exome analyses. However, individual validation of NGS approaches for *DYSF* gene has not been performed.
Objective: We applied and validated a targeted NGS based sequencing method for mutation detection of dysferlinopathy.
Patients and Methods: Forty-one patients with dysferlinopathy were enrolled in this study. Dysferlinopathy was confirmed by immunohistochemistry staining and/or western blot analysis of skeletal muscles, Among the 41 patients, nine had their known *DYSF* mutations confirmed by conventional sequencing methods. Targeted NGS using hybrid capture was initially tested on nine samples with known mutations. The developed screening method was applied to 32 new patients with dysferlinopathy.
Results: Mean depth of coverage was approximately 450 fold and almost all (99.3%) of targeted region had sequence coverage greater than 20 fold. When this approach was tested on samples from patients with known *DYSF* mutations, all known mutations were correctly retrieved. Using this method on 32 consecutive patient samples with dysferlinopathy, at least two pathogenic variants were detected in 28 (87.5%) samples and at least one pathogenic variant was identified in all samples.
Conclusion: Our results suggested that NGS-based screening method could facilitate efficient and accurate genetic diagnosis of dysferlinopathy.

doi:10.1016/j.jns.2015.08.1224

1174

WFN15-1440

Neuromuscular Disorders

Reccurent form of parsonage-turner syndrome: case Report

O. Sinanovic, S. Zukic, E. Jusufovic, M. Muminovic Umihanic, M. Barucija, M. Muftic. *Department of Neurology, University Clinical Center, Tuzla, Bosnia and Herzegovina*

Background: Parsonage-Turner syndrome (PTS) is a rare but distinct peripheral nervous system disorder that may occur in otherwise healthy individuals. It occurs with an overall reported incidence of 1.64/100.000. The classic description of PTS is a condition in which the patient initially and suddenly develops constant, severe unilateral shoulder girdle pain. The pain may extend to the trapezius ridge, upper arm, forearm, and hand. The duration of pain is lasting 1 to 2 weeks, but on rare occasion persisting for longer time. Although not present initially, weakness may develop a few days to weeks after the initial onset of symptoms. Patients affected range from 3 months of age to 75 years. However, the highest incidence of PTS occurs in individuals between the third and seventh decades. The prognosis of PTS for the majority of patients is good, with an estimated three-quarters of all patients making a complete recovery within 2 years. According to knowledge from the published cases, only few patients may experience a relapse of the symptoms, and these tend to be less intense and last a much shorter duration.
Case report: Here we report a 41-year-old right-hand-dominant man with idiopathic PTS who had three episodes of shoulder pain followed by shoulder weakness and atrophy at the age of 13, 26 and 41 years, respectively. These symptoms were self-limited and disappeared within 9-12 months in first two episodes. The patient was examined two months after onset of the third episode, and electromyography revealed neurogenic changes in the shoulder muscles.

doi:10.1016/j.jns.2015.08.1225

1175

WFN15-0642

Neuromuscular Disorders

Cognitive impairment in patients with chronic inflammatory demyelinating polyneuropathy (Cidp) – preliminary report

K. Slotwinski[a], M. Koszewicz[a], E. Dziadkowiak[b], J. Bladowska[c], S. Budrewicz[a], R. Podemski[a]. [a]*Department of Neurology, Wroclaw Medical University, Wroclaw, Poland;* [b]*Department of Neurology, Academic Clinical Hospital im. Jana Mikulicza-Radeckiego, Wroclaw,*

Poland; [c]Department of Radiology, Wroclaw Medical University, Wroclaw, Poland

Background: In patients with chronic inflammatory demyelinating polyneuropathy (CIDP) slight clinical central impairment together with changes in MRI were noted previously. The aim of the study was the evaluation of cognitive functions in patients with clinically and electrophysiologically certain recognition of CIDP.
Materials and methods: 7 patients with clinical and electrophysiological confirmed CIDP (4men, 3 women, mean age – 57.2 years old) were examined. In all patients MRI was done were within normal limits. We performed neurological and neuropsychological examination by use of Auditory Verbal Learning Test (AVLT) , The Rey-Osterrieth Complex Figure Test (TRF),Trail Making Test (TMT A and B), and The Controlled Oral Word Association Test (COWAT). Emotional status was assessed in Beck scale. The results were compared with appropriately matched for age and gender control group without neurological symptoms.
Results: Cognitive dysfunctions were seen in all patients. In CIDP patients the results of executive function, selectiveness and divisibleness of attention were significantly lower in the comparison to the controls.
Conclusions: The profile of the neuropsychological results suggests the dysfunction of prefrontal cortex in CIDP patients. In this preliminary report the authors consider the possibility of immune-mediated cortex damage.

doi:10.1016/j.jns.2015.08.1226

1177

WFN15-0912

Neuromuscular Disorders

Carbamazepine responsive cramp fasciculation syndrome: a case report

A. Cetiz[a], S. Tasdemir[b], H. Akgun[a], S. Alay[a], O. Oz[a], U. Ulas[a], S. Demirkaya[a]. *[a]Department of Neurology, Gulhane Military Medical Academy, ANKARA, Turkey; [b]Department of Neurology, Beytepe Military Hospital, ANKARA, Turkey*

Background: Cramp-fasciculation syndrome is a peripheral nerve hyperexcitability syndrome that presents with muscle pain, cramps, and exercise intolerance. Many drugs are used with varying levels of success.
Objective: In this report, we present a case of cramp fasciculation syndrome responsive to carbamazepine treatment.
Patient and Methods: A 21-year-old male presented to our clinic with complaints of cramps and contraction in the legs and intolerance of movements that require effort. Neurological examination was normal. Mild transaminase elevation and creatine kinase elevation (1341 U/L) were detected in routine biochemistry tests. Nerve conduction studies and F responses were normal.
Results: In needle EMG, rare doublet and triplet complex repetitive discharges were monitored from the bilateral gastrocnemius muscles at rest. These findings were compatible with cramp fasciculation syndrome when evaluated with the patient's clinical findings. Carbamazepine (400 mg/day) treatment was started. One month later, the patient's symptoms significantly decreased.
Conclusion: We present this case report due to the rare occurrence of cramp fasciculation syndrome and the patient's benefit from carbamazepine therapy.

doi:10.1016/j.jns.2015.08.1227

1178

WFN15-0974

Neuromuscular Disorders

Myositis ossificans mimicking inflammatory myopathy: a case report

A. Cetiz[a], M. Korkmaz[a], S. Alay[a], S. Tasdemir[b], H. Akgun[a], S. Hamcan[c], S. Demirkaya[a]. *[a]Department of Neurology, Gulhane Military Medical Academy, ANKARA, Turkey; [b]Department of Neurology, Beytepe Military Hospital, ANKARA, Turkey; [c]Department of Radiology, Gulhane Military Medical Academy, ANKARA, Turkey*

Background: Inflammatory myopathies usually affect proximal muscles and have a progressive clinical course. Polymyositis mainly affects the skeletal muscle in both sides of the body. Arthritis may accompany polymyositis.
Objective: In this case report, we discuss a patient with myositis ossificans clinically suggestive of polymyositis.
Patient and Methods: A 22-year-old male was admitted to our clinic with complaints of weakness, severe pain, and a sense of swelling in both legs after working in cold weather for 1 week. He had complaints of pain and slight weakness in his lower extremities for 7 years. His neurological examination revealed severe pain upon palpation of both of the leg muscles and hardness in the left rectus femoris. Blood biochemistry revealed normal creatine kinase (84 U/L), rheumatoid factor (<16.4 IU/ml), and C-reactive protein (<3.1 mg/L) levels; the sedimentation rate was 17 mm/h. The EMG evaluation was normal. Brain, cervical, thoracic, and lumbar MRI were all normal.
Results: X-ray graphy indicated soft tissue calcification superimposed on the bilateral thighs and the right cruris muscle tissue. These findings were suggestive of myositis ossificans. The patient underwent a muscle biopsy, and the results comfirmed the diagnosis of myositis ossificans. Medical and physical therapy were planned.
Conclusion: Muscle pain, muscle weakness, and a sense of swelling in the muscles imply that this patient case clinically resembles polymyositis. However, the laboratory and imaging findings showed myositis ossificans. If a radiograph were performed instead of an MR imaging, the diagnosis could have been made much more quickly. In clinical practice, physicians should keep in mind that there may be patients with non-traumatic myositis ossificans clinically mimicking polymyositis.

doi:10.1016/j.jns.2015.08.1228

1179

WFN15-1522

Neuromuscular Disorders

Miller fisher syndrome: a case report

H. Akgun[a], Z. Ozkan[a], S. Tasdemir[b], A. Cetiz[a], S. Demirkaya[a]. *[a]Department of Neurology, Gulhane Military Medical Academy, ANKARA, Turkey; [b]Department of Neurology, Beytepe Military Hospital, ANKARA, Turkey*

Background: Miller Fisher syndrome (MFS) is a variant of Guillan Barre syndrome characterized by ophthalmoplegia, ataxia and areflexia. In general, the patient with MFS have experienced a viral infection before the onset of the condition.
Objective: Here, we report the MFS presented with bilaterally ptosis, difficulty swallowing , nasal voice and normal EMG.
Patient - Methods: A 32- year-old woman was admitted to our clinic with the complaints of double vision, vertigo, difficulty swallowing and speech impairment. She had upper respiratory tract

infection 2 weeks before these complaints. On the neurological examination, she had limited ability to move her eyes up and out, had bilaterally ptosis, nasal voice , ataxia and numbness on the edges of legs and hands. The muscle strength was normal. The plantar reflexes were flexor and the deep tendon reflexes were absent. The blood laboratory, brain tomography and brain MRI were normal.

Results: In the first day EMG, the median nerve conduction velocity was slow. The treatment of IVIg (0,4 mg/kg) was started. The restriction of eyes movement increased after two days. In EMG of 3th day, the sensory nerve action potential of the right ulnar and sural nerve could not be obtained. Motor conductions were normal. The IVIg treatment were given for 5 days.

Conclusion: The EMG can be normal in the first days of MFS while the clinical findings support it. In our case, there was a normal EMG except the mild slowing of median nerve sensory conduction. So this disease must be diagnosed with the clinical findings and in the following days the diagnosis can be supported by the laboratory findings.

doi:10.1016/j.jns.2015.08.1229

1180

WFN15-1450

Neuromuscular Disorders

Myasthenic presentation of recessive job syndrome (case report)

W. Trillo Alvarez[a], C.E. Lopez Colque[b]. *[a]Neurology, Hospital Nacional Carlos Alberto Seguin Escobedo EsSalud, Arequipa, Peru; [b]Escuela de Medicina Humana, 4th Year Student Universidad Católica de Santa Maria, Arequipa, Peru*

Background: Job syndrome is a primary immunodeficiency, with manifestations like eosinophilia, pneumonia with pneumatoceles, abscessed dermatitis, characteristic anthropomorphic features and serum IgE levels > 2000 IU / mL. The autosomal recessive form is characterized by a variation in IL-4, chemotaxis and loss of function of the protein dedicator of cytokinesis 8 (DOCK8) (1). To our knowledge only 136 cases up to 2014 have been reported. (2)

Objective: Make First Report of myasthenic like presentation of clinically suspected autosomal recessive hyper IgE syndrome.

Patients and Methods: A 15 year old patient (from whom and her legal guardians we have obtained approval, as necessary) with recurrent respiratory and skin infections. 14 days prior to admission, presented with poly-arthralgia, myalgia, holocranial headache, skin lesions, also diplopia, nystagmus, paraparesis, progressing to quadriplegia and cranial nerves paralysis.

Results: Showed IgE 2421UI/mL and eosinophils 5%. EMG, LP and physical exam were negative for GBS. Bone marrow biopsy revealed mild hyperplasia of eosinophilic myeloid series. Diagnosis was performed using Grimbacher checklist, scoring 50 points (more than 40 points is a likely diagnosis). All abnormalities returned to baseline after IVIG treatment.

Conclusion: This is the first report of myasthenic presentation of recessive Job syndrome, and further genetic testing is being pursued.

Keywords: Recessive Job Syndrome, myasthenic presentation, case report

doi:10.1016/j.jns.2015.08.1230

1181

WFN15-0749

Neuromuscular Disorders

The effectiveness of diagnostic methods of compressive neuropathy of the median nerve

F.R. Villar Flores[a], E. Maleckiy[b], V. Pustozerov[a], S. Lovzin[a], I. Milutka[a]. *[a]Neurology, North-Western State Medical University named after I.I.Mechnikov, Saint Peterburg, Russia; [b]Radiology, North-Western State Medical University named after I.I.Mechnikov, Saint Peterburg, Russia*

Background: The most common type of compressive neuropathy (CN) of the upper limb is the carpal tunnel syndrome (CTS). Diagnosis methods of CN include electrodiagnostic testing (EDT) and ultrasound scanning (US). EDT is the "gold standard" for determining severity characteristic in CN, but this method only shows the functional state of the nerve. However, US can be a more informative diagnostic tool to determinate the morphological changes of the nerve trunk.

Objective: To improve the clinical evidence of CTS by performing EDT and US studies.

Patients and Methods: This study involved 75 patients [30 (40%) males, 45 (60%) females] aged 33 to 90 years. All patients were examined with a complete clinical examination, EDT and US. To assess the extent of damage, the effectiveness of treatment of CN, health and quality of life, questionnaires were used: Boston questionnaire and QuickDASH scale.

Results: 33 (44%) patients with CTS had a positive provocative Phalen test less than one minute ($p < 0{,}001$), most of patients (40-53%) had motor defects on the right hands, the severity of which was correlated with data from EDT ($p < 0{,}001$). In 32 (94%) patients, US found changes in the cross-sectional area of the right carpal canal ($p < 0{,}05$). 3 patients underwent decompression of the median nerve and the remaining patients received conservative therapy as a standard comprehensive treatment.

Conclusion: The combination of a detailed clinical examination, with the results of EDT and US and further research, diagnosis can be more accurately determined and appropriate counseling and treatment methods properly selected.

doi:10.1016/j.jns.2015.08.1231

1182

WFN15-0303

Neuromuscular Disorders

Myotonic dystrophy in Czech Republic: data from the national registry

S. Vohanka[a], O. Parmova[a], R. Mazanec[b], J. Strenkova[c], P. Ridzon[d], E. Ehler[e], A. Vavra[e], M. Forgac[f], J. Junkerova[g], T. Bozovsky[h], P. Kunc[i]. *[a]Department of Neurology, University Hospital Masaryk University, Brno, Czech Republic; [b]Department of Neurology, University Hospital Charles University, Prague- Motol, Czech Republic; [c]Institute of Biostatistics and Analyses, Masaryk University, Brno, Czech Republic; [d]Department of Neurology, Thomayer Hospital, Prague, Czech Republic; [e]Department of Neurology, Regional Hospital, Pardubice, Czech Republic; [f]Department of Neurology, General University Hospital Charles University, Prague, Czech Republic; [g]Department of Neurology, University Hospital, Ostrava, Czech Republic; [h]Department of Neurology, University Hospital, Plzen, Czech Republic; [i]Department of Neurology, University Hospital, Hradec Kralove, Czech Republic*

Background and objectives: Myotonic dystrophy is the most common form of muscular dystrophy that begins predominantly in adulthood. The prevalence of the two types varies among different geographic and

ethnic populations. Patient registries represent key instruments by pooling data for clinical research, epidemiological assessment, and observational studies in rare diseases.

Patients and Methods: The Czech National Registry of Myotonic Disorders was established in 2011 and up to February 2015 348 patients from 8 centres have been included.

Results: 207 (59%) patients are suffering from myotonic dystrophy type 2 (DM2) and 141 (41%) from myotonic dystrophy type 1 (DM1), 219 females (63%) and 129 males (37%). Mean age in the time of the registry entering is 45 years, approximately 10 years after disease manifestation which was in patient with DM1 25 (10- 54) years and in persons with DM2 40 (17-62) years. Nearly all patients with both forms are ambulatory (assisted or unassisted). Only 4 patients are wheelchair bound (three with DM1). We could not found the difference between both types in 6 min. walking test and motor functions expressed as summary of MRC score. The presence of cataracts was also similar in both groups. Patients suffering from MD1 have had more severe myotonia, heart problems (esp. arrhythmias), dysphagia, and fatigue ($p < 0.001$, Fisher exact test for categorical and Mann-Whitney U test for continuous variables).

Conclusion: In Czech population (Middle Europe, 10.5 mil. inhabitants) is more frequent DM2 than DM1. Patients with DM1 are younger and more compromised than patients with DM2.

doi:10.1016/j.jns.2015.08.1232

1183

WFN15-1235

Neuromuscular Disorders

A proposal: Isaacs' syndrome (acquired neuromyotonia) diagnostic criteria

O. Watanabe, S. Nozuma, K. Michizono, E. Matsuura, H. Takashima, A. Kimiyoshi. *Neurology and Geriatrics, Graduate School of Medical and Dental Sciences Kagoshima University, Kagoshima, Japan*

Acquired neuromyotonia, also called Isaacs' syndrome has characteristic features of the clinical manifestations and electrophysiological findings. VGKC complex antibodies are well known as its biomarker, but the positive rate is around 30%. In Japan, the number of patients of the Isaacs' syndrome is estimated to be at least around 100 cases than the number of VGKC complex antibody screening requests to our laboratory. We made provisional diagnostic criteria (the following) and gathered the opinion through the announcement in the Japanese associated societies.

A. Major symptoms/signs:

1. neeuromyotonia (indispensable: grip myotonia without percussion myotonia).
2. continuous muscle cramp or stiffness.

Peripheral Nerves Hyperexcitability (ex. myokymic discharges, meuromyotonic dischartes) on EMG.

3. anti-VGKC complex antibodies positive
4. effectiveness of immunemodulation/immunesuppression therapy (ex. Steroids, Plasma exchanges, others)

B. Minor (supporting) symtoms/signs:

1. hyperhidrosis.
2. numbness or pain of limbs
3. thymoma
4. skin color changes
5. other autoantibodies (anti-AChR antibodies, ANA, TPO, etc)

Definite: all of A.
Probable (1 or 2 of A, more than 2 points of B).
Possible (1 or 2 of A, one point of B).

doi:10.1016/j.jns.2015.08.1233

1184

WFN15-0659

Neuromuscular Disorders

Deep paraspinal muscles in idiopathic scoliosis - expression of calmodulin, melatonin receptor-1a and estrogen receptor-2

J. Zamecnik[a], L. Krskova[a], R.A. Dahmen[a], J. Hacek[a], I. Stetkarova[b], P. Vasko[b], V. Bocek[b], K. Brabec[b], M. Krbec[c]. *[a]Department of Pathology and Molecular Medicine, Charles University 2nd Faculty of Medicine and University Hospital Motol, Prague, Czech Republic; [b]Department of Neurology, Charles University Third Faculty of Medicine and Faculty Hospital Kralovske Vinohrady, Prague, Czech Republic; [c]Department of Orthopedics and Traumatology, Charles University Third Faculty of Medicine and Faculty Hospital Kralovske Vinohrady, Prague, Czech Republic*

Background: The pathogenesis of idiopathic scoliosis (IS) as well as the local changes in deep paraspinal muscles in IS have been poorly understood. The asymmetric expression of several molecules, including melatonin receptor-1A (MTNR1A), calmodulin (CALM1) and the estrogen receptor-2 (ESR2), has been previously suggested to be involved.

Objective: To evaluate the symmetry of mRNA expression of MTNR1A, CALM1 and ESR2 in deep paraspinal muscles in IS patients by quantitative Real-Time PCR (qRT-PCR) and to compare it with non-scoliotic controls.

Patients and Methods: 18 IS patients (14 females, 4 males, 12 - 29 years) and 9 non-scoliotic controls were enrolled into this study. Muscle biopsy samples from deep paraspinal muscles (from convexity and concavity of the scoliotic curve in IS patients, or from left and right side in controls) were obtained during spinal surgery. In each sample, relative mRNA expressions of MTNR1A, CALM1 and ESR2 were evaluated and quantified by qRT-PCR. The study obtained Institutional Review Board approval.

Results: mRNA expressions of none of the investigated molecules were significantly different when compared convex and concave side of the scoliotic curve in IS patients, or when compared IS patients with controls. In case of MTNR1A, the expression in paraspinal muscles was very weak, and in more than half of the cases it could not be detected by qRT-PCR analysis.

Conclusion: Our data do not support the previously suggested role of the asymmetric expression of the investigated molecules in deep paraspinal muscles in the pathogenesis of IS.

Supported by IGA NT/13693-4.

doi:10.1016/j.jns.2015.08.1234

1185

WFN15-0933

Neuromuscular Disorders

Novel mutation of the ntkr1 gene in a patient with hereditary sensory and autonomic neuropathy type iv phenotype

G. Zanga[a], R. Reisin[b], F. Ingallina[c], L. Schottlaender[d], H. Houlden[d], E. Fulgenzi[a]. *[a]Neurologia, Unidad Asistencial Cesar Milstein, Ciudad Autónoma de Buenos Aire, Argentina; [b]Neurologia, Hospital Britanico, Ciudad Autónoma de Buenos Aire, Argentina; [c]Cardiologia, Instituto Lanari, Ciudad Autónoma de Buenos Aire, Argentina; [d]Molecular neuroscience, Institute of Neurology London, London, United Kingdom*

Introduction: Hereditary sensory and autonomic neuropathy (HSAN) type IV is a rare congenital disorder with insensitivity to pain, autonomic dysfunction with anhidrosis and intellectual disability. It is caused by mutations of the NTKR1 gene encoding for the neurotrophic tyrosine kinase receptor type 1.
Objective: To describe a case of HSAN IV with a novel mutation of the *NTKR1* gene.
Case report: 43-years-old woman with consanguineous parents and congenital insensitivity to pain. She had developmental delay, early full dentition with premature loss of teeth and recurrent febrile episodes in childhood without infection. Lumbar spine damage with inability to walk 2 years ago.

Neurological examination: mild mental retardation. Generalized areflexia, distal weakness in the lower limbs. Widespread loss of thermal sensation and hypohidrosis. Ligamentous laxity. Lingual mutilation and multiple joint deformities. Severe orthostatic hypotension.
Studies: MRI of lumbar spine with vertebral compression fracture of L5, multiple disc protrusions from L2 to S1 with involvement of nerve roots and foramina. Electromyography: signs of severe bilateral lower limb polyradicular damage; slight sensitive amplitude decrease as the only abnormal finding on upper limbs.

A genetic study was peformed with a second-generation panel sequencing Trusight Inc® Illumina. A homozygous mutation of the *NTKR1* gene C.C2293T: p.R765C was identified. This mutation has not been previously reported in patients nor in most common databases. We are currently conducting studies of segregation of the mutation in the family.
Conclusions: We present a patient with a clinical phenotype of HSAN IV and a novel homozygous mutation in the *NTKR1* gene

doi:10.1016/j.jns.2015.08.1235