80%. Sleeping disorders and tiredness were considered as the two most problematic symptom to deal with. We found no correlation between the degree of pain and presence and severity of symptoms reported. Number of symptoms reported diminished when the dose of opioids increased.

Conclusions: The pain patient considered too complex for regular pain-management programs are characterized by reporting many symptoms other than pain. High pain intensity or high opioid-dose does not correlate to presence or severity of other symptoms, and high dose of opioids does not have a connection to low pain intensity. Many of the symptoms commonly reported – lethargy, tiredness, concentration difficulties and headache are real obstacles for successful rehabilitation, and have to be dealt with to achieve successful results.

http://dx.doi.org/10.1016/j.sjpain.2015.04.010

Increased C-fiber response induced by experimental disc herniation is associated with upregulation of fractalkine and its receptor in nucleus pulposus and dorsal root ganglion

D.P. Jacobsen [a,b,*], A. Moen [a,b], F. Haugen [a], J. Gjerstad [a,b]

[a] National Institute of Occupational Health, Oslo, Norway
[b] Department of Biosciences, University of Oslo, Norway
E-mail address: dpja@stami.no (D.P. Jacobsen).

Aims: Lumbar radicular pain following intervertebral disc herniation may be caused by a local inflammatory response induced by nucleus pulposus (NP) cells. Here in an animal model mimicking the clinical situation following disc herniation we investigated the effect of NP on the spinal nociceptive signaling and local gene expression.

Methods: In anaesthetized Lewis rats, extracellular single unit recordings of spinal nociceptive activity and qPCR were used to explore the effect of NP application onto the dorsal nerve roots (L3-L5). All animal experiments were approved by the Norwegian Animal Research Authority and were performed in conformity with the laws and regulations controlling experiments and procedures on live animals in Norway.

Results: A clear increase in C-fiber response was observed following NP conditioning. In the NP tissue, the gene expression of interleuking-1β (IL-1β), colony stimulating factor 1 (Csf1), fractakine (CX3CL1) and the fractalkine receptor CX3CR1 was increased. Minocycline, an inhibitor of microglial activation, inhibited the increase in neuronal activity, and attenuated the increase in gene expression in NP tissue. Interestingly, gene expression analysis demonstrated an increase in the expression of TNF, CX3CL1 and CX3CR1 in the dorsal roots ganglion (DRG). An increase in the expression of IL-1β and TNF in cultured DRG cells was also induced in vitro.

Conclusions: The present study suggests that hyperexcitability in the pain pathways after disc herniation may involve upregulation of CX3CL1 signaling in NP – but also in the DRG.

http://dx.doi.org/10.1016/j.sjpain.2015.04.011

Chronic pain-related patient-provider communication: The significance of health related quality of life and satisfaction

T. Jonsdottir [a,*], S. Gunnarsdottir [b,c], H. Jonsdottir [b]

[a] University of Akureyri, Akureyri, Iceland
[b] University of Iceland, Reykjavik, Iceland
[c] Landspitali, The National University Hospital of Iceland, Iceland
E-mail address: torbj@unak.is (T. Jonsdottir).

Aims: To investigate patients' perception of chronic pain related patient-provider communication in relation to socio-demographic and pain-related variables.

Methods: A postal questionnaire measuring socio-demographic variables, pain characteristics, health-related quality of life (HRQoL), pain-related health care utilization and perceived patient-provider communication, was sent to a sample of 4500 individuals randomly drawn from the national population of Iceland. Relationships between patient perceived patient–provider communication and perceived outcome, satisfaction with care as well as socio-demographic and pain-related variables were tested by using bivariate and multivariate statistical analysis.

Results: The prevalence of chronic pain (≥3months) among respondents was 47.5%. Among participants reporting chronic pain, 53.2% had consulted a health care provider for pain during the previous six months. Patients' perception of providers' behaviour and control in the communication was mostly related to pain impact on daily life and physical components of HRQoL as well as to patients' satisfaction with health care providers. The more pain interfered with daily life and impaired patients' physical health, the more they felt that the provider did not spend time to listen to their concerns and discuss symptoms and treatment options. Patients' perception of own activity and control in the patient-provider communication and participation in care was related to socio-demographic variables but not with pain related variables.

Conclusions: To be understood as an individual and having their concerns legitimized by the health care provider is crucial for patients when consulting health care for chronic pain. The more pain interferes with daily life and impairs HRQoL, the more important this is. Patients' perception of own control in patient-provider communication and participation in care is more related to socio-demographics than pain related variables.

http://dx.doi.org/10.1016/j.sjpain.2015.04.012

Gender differences in chronic pain related health care utilization

T. Jonsdottir [a,*], H. Jonsdottir [b], S. Gunnarsdottir [b,c]

[a] University of Akureyri, Akureyri, Iceland
[b] University of Iceland, Reykjavik, Iceland
[c] Landspitali, The National University Hospital of Iceland, Iceland
E-mail address: torbj@unak.is (T. Jonsdottir).

Aims: To investigate predictors for health-care utilization for chronic pain and whether there are gender differences in variables predicting chronic pain-related health care utilization.

Methods: A postal questionnaire measuring socio-demographic variables, pain characteristics, health related quality of life (HRQoL) and pain related health care utilization, was sent to a sample of 4500 individuals randomly drawn from the national population of Iceland. The relationships between socio-demographic and pain related variables and pain related health care utilization among

participants reporting chronic pain ($\geq$3 months) were tested by using bivariate and multivariate statistical analysis.

Results: The prevalence of chronic pain among respondents was 47.5%. Among participants reporting chronic pain, 53.2% had consulted a health care provider for pain during the previous six months. Predictors for pain related health care utilization were pain interference with daily life and pain pattern (daily pain) as well as physical components of HRQoL. Even though health care utilization was not related to gender, there were gender differences in pain-related predictors for health care utilization. Interference with daily life and pain pattern were the strongest predictors among women, but interference with life and the physical components of HRQoL were the strongest predictors for men. Pain related health care utilization was not related to socio-demographic variables.

Conclusions: Pain related variables are better predictors of chronic pain related health care utilization than socio-demographics. Even though gender does not predict chronic pain-related health care utilization, there are gender differences in the relationships between pain-related variables and health care utilization. These gender differences warrant further exploration.

http://dx.doi.org/10.1016/j.sjpain.2015.04.013

Cerebrospinal fluid levels of substance P (SP) N-terminal fragment SP_{1-7} in patients with neuropathic pain

A. Jonsson[a,*], A.-L. Lind[b], M. Hallberg[a], F. Nyberg[a], T. Gordh[b]

[a] *Uppsala University, Department of Pharmaceutical Biosciences, Uppsala, Sweden*
[b] *Uppsala University Hospital, Department of Surgical Sciences, Anaesthesiology and Intensive Care, Uppsala, Sweden*
E-mail address: Anna.Jonsson@farmbio.uu.se (A. Jonsson).

Aims: Neuropathic pain is a complex and painful condition, which is difficult to treat and causes a lot of suffering. The substance P (SP) system is well known to be involved in nociceptive signaling and it has previously been shown that the cerebrospinal fluid (CSF) level of SP is decreased in neuropathic pain. In this study we analyzed CSF from chronic neuropathic pain patients for the levels of SP_{1-7}, an N-terminal fragment of SP with the ability to alleviate thermal as well as mechanical hypersensitivity in different animal models of chronic neuropathic pain, e.g. [1,2].

Methods: CSF was collected from 11 neuropathic pain patients, treated with SCS, who had refrained from using their spinal cord stimulator for 48 h. Control CSF was collected from 11 patients without any known neurological disorder, who underwent minor surgery under spinal anesthesia. The CSF samples were analyzed for the levels of SP_{1-7} using radioimmunoassay.

Results: The results revealed a decrease in the level of SP_{1-7} compared to controls. We believe that the lower level of SP_{1-7} most likely is a consequence of reduced amount of its precursor SP in the neuropathic pain patients.

Conclusions: Our results indicate that the SP system is changed in patients with neuropathic pain and that SP-related peptides, including SP_{1-7}, might serve as biological markers for the pathophysiology of chronic neuropathic pain.

References

[1] Carlsson A, Ohsawa M, Hallberg M, Nyberg F, Kamei J. Substance P_{1-7} induces antihyperalgesia in diabetic mice through a mechanism involving the naloxone-sensitive sigma receptors. Eur J Pharmacol 2010;626:250–5.

[2] Carlsson-Jonsson A, Gao T, Hao J, Fransson R, Sandström A, Nyberg F, Wiesenfeld-Hallin Z, Xu X-J. N-terminal truncations of substance P_{1-7} amide affect its action on spinal cord injury-induced mechanical allodynia in rats. Eur J Pharmacol 2014;738:319–25.

http://dx.doi.org/10.1016/j.sjpain.2015.04.014

Characterization of small nerve fibers in painful distal symmetric polyneuropathy and healthy controls

P. Karlsson[a,d,*], S. Haroutounian[a,b], M. Polydefkis[c], J.R. Nyengaard[d], T.S. Jensen[a,e]

[a] *Danish Pain Research Center, Aarhus University Hospital, Aarhus, Denmark*
[b] *Department of Anesthesiology, Washington University School of Medicine, St. Louis, MO, USA*
[c] *Department of Neurology, The Johns Hopkins Hospital, Baltimore, MD, USA*
[d] *Stereology and Electron Microscopy Laboratory and Centre for Stochastic Geometry and Advanced Bioimaging, Aarhus University Hospital, Aarhus, Denmark*
[e] *Department of Neurology, Aarhus University Hospital, Aarhus, Denmark*
E-mail address: pall@clin.au.dk (P. Karlsson).

Aims: The introduction of skin biopsies to examine small nerve fiber morphology together with functional measures such as quantitative sensory testing (QST) has led to an improvement in diagnosing patients with small fiber neuropathy (SFN). Quantification of intraepidermal nerve fiber density (IENFD) is an important measure in SFN. However, the relationship between structure and function is not straightforward and the morphological and functional fiber characteristics are still unclear. This study aimed to combine structural and functional measurements to improve the diagnosis of distal symmetric polyneuropathy and small fiber involvement. Additionally, we investigated whether patients and healthy controls have differential patterns of correlations between structural and functional nerve measurements.

Methods: 17 patients with painful distal symmetric polyneuropathy (DSP) and 19 controls underwent comprehensive small fiber assessments that included quantitative sensory testing, response to topical capsaicin and analysis of skin biopsy samples (IENFD, epidermal and dermal nerve fiber length densities (eNFLD, dNFLD) and swellings).

Results: DSP patients had reduced sensitivity to cold and heat, diminished capsaicin response, and lower IENFD, eNFLD and dNFLD (all $p < 0.0003$). The correlation between structural and functional parameters was better in controls than in DSP. A diagnostic approach of combined IENFD and eNFLD utilization, increased DSP diagnostic sensitivity from 82.0% to 100% and specificity from 84.0% to 89.5%.

Conclusions: A correlation is found between functional and structural small fiber parameters for DSP and controls, and an approach to improve diagnostic accuracy in DSP is suggested.

http://dx.doi.org/10.1016/j.sjpain.2015.04.015