



The Belgian Pain Society presents
the 1st Young Researchers Day

THE NEXT GENERATION IN PAIN RESEARCH

5th of March 2020

PROGRAM BOOK





WELCOME

Early 2019, the board of the Belgian Pain Society (BPS) took the decision to organize a multidisciplinary “BPS Young Researchers Day” that would bring together the many researchers and clinicians having an interest in basic or clinical research in the field of pain in Belgium.

The first objective of the meeting was to provide early-stage researchers and clinicians a unique opportunity to get to know each other, to learn about their research, and to exchange ideas and to interact. The second objective was to promote “bench-to-bedside” collaborations between basic researchers and clinicians. For this reason, although all scientific communications will be made by junior fellows (PhD students, postdoctorate researchers, clinicians in training), more senior researchers and clinicians were invited to attend this multidisciplinary event.

Another decision of the board was to hand over the scientific organization of the event to a group of junior fellows, and to let them decide the meeting format and program that they felt would be optimal to promote interdisciplinary interactions. This scientific committee was constituted in May, and composed of seven highly motivated young researchers from UCLouvain, UAntwerpen, KULeuven, UGent, UHasselt, ULiège and VUB.

Following a call for abstracts, more than 60 proposals were submitted. For this reason, decision was taken to organize two parallel sessions, to favor to-the-point “blitz” communications, and to dedicate sufficient time for poster viewing including poster walks.

The organizing committee also decided to organize a debate session on the topic of central sensitization, because it constitutes a “hot topic” both for researchers and for clinicians. We hope and expect that the contrasting views on this topic will lead to lively discussions.

In the name of the board of the Belgian Pain Society, I would like to sincerely thank the scientific organizing committee for their commitment, and wish all attendees a rich and stimulating day.

André Mouraux
President of the Belgian Pain Society





THE BELGIAN PAIN SOCIETY

Mission

The Belgian Pain Society, Belgian chapter of the International Association for the Study of Pain (IASP, <http://www.iasp-pain.org>), is a multidisciplinary scientific association which assembles the medical profession and non-medical professionals involved in chronic and acute pain. The goals of our association is to support the education for the treatment of pain, stimulate the pain research, encourage the treatment of a patient by creating a network that is adapted for the correct treatment and participate in the application of the public health care.

Membership

The BPS is a scientific association made up of health professionals such as doctors, nurses, psychologists, occupational therapists, physiotherapists, dentists, social assistants, etc. As a scientific association, the missions of the BPS are: to support training in pain treatment, to stimulate research on pain, to promote the treatment of the patient and to participate in health care policies. Your membership contributes to the realisation of its objectives.

Membership benefits:

- Reduced registration rate for the annual scientific congress of the BPS on 6 June 2020.
- Free access to the online European Journal of Pain.
- Possibility to be part of the European Pain Federation EFIC, of which the BPS is a Belgian chapter, and to obtain our support when enrolling at a Pain School.
- Possibility to set up Special Interest Group (SIG) or Professional Interest Group (PIG) and become a member of it, in accordance with the statutes (see <http://www.belgianpainsociety.org/about-bps-belgian-pain-society/statutes>).
- Access to the member area of our website
- Regular distribution of information we obtain concerning pain by email. Interesting ideas, articles, etc. can be sent to info@belgianpainsociety.org.

Membership fees:

- You pay EUR 45 membership fee per year as psychologist, nurse, physiotherapist, doctor in training.
- You pay EUR 70 membership fee per year as a doctor, doctor-specialist.
- You pay EUR 35 membership fee per year as a retired doctor.





How to become a member: In order to apply for or renew your 2020 membership, all you have to do is pay the right amount according to your income to account number IBAN BE89 3101 6231 0085 of the Belgian Pain Society, mentioning your name, address, email address and "Membership fee 2020".

BPS Congress 2020

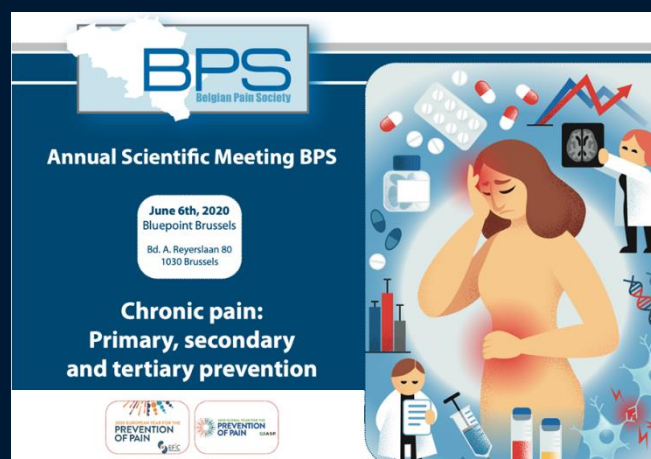
Bluepoint Brussels, 06-06-2020, 09:00-16:00

Plenary presentations:

- PECS block new hype or new standard, B. Versyck (Turnhout)
- Efficacy of screening tools for neuropathic pain in daily clinical practice, H. Timmerman (the Netherlands)
- Secondary prevention: the key role of the first-line professionals, A. Berquin (Brussels)
- Prevention in back pain: importance of risk stratification and assessment of rehabilitation potential, P. Van Wambeke (Leuven)
- Clinical, psychological and genetic risk factors for the development of chronic (neuropathic) pain, Didier Bouhassira (France)

Workshops:

- Patient education: complementary perspectives from physiotherapy and psychology, Sarah Maes (Gent) and Els Aerts (Dutch)
- Patient education: complementary perspectives from physiotherapy and psychology, Annabel Wunsch (Mont-Godinne) and Jacques d'Haeyere (Ottignies) (French)
- Increasing absenteeism and work disability, Guy Hans (Antwerp), Els Mermans (Working Link) (Dutch), Katrien Mortelmans (Neutraal Ziekenfonds/Union neutre)





ORGANISING COMMITTEE

André Mouraux (representative from the Belgian Pain Society)

Conny Goethals (representative from the Belgian Pain Society)

Jessica Van Oosterwijck (representative from Ghent University)

Post-doctoral Research Fellow from the Research Foundation - Flanders (FWO), visiting Professor University of Antwerp - Department of Rehabilitation Sciences and Physiotherapy, associate Professor Ghent University - Department of Rehabilitation Sciences.

Research interests: central nervous system mechanisms of pain and fatigue, exercise pathophysiology, pain-motor interactions and rehabilitation in chronic pain populations.



An De Groef (representative from KULeuven)

Post-doctoral Research Fellow from the Research Foundation - Flanders (FWO) at KULeuven - Department of Rehabilitation Sciences and University of Antwerp - Department of Rehabilitation Sciences and Physiotherapy.

Research Interest: Assessment, prevention and treatment of pain and other comorbidities during and after cancer treatment.



Audrey Vanhauzenhuysse (representative from University of Liège)

Neuropsychologist and postdoctoral researcher at University Hospital of Liège - Algology Department. Post-doctoral Research Fellow the Belgian National Fund for Scientific Research (FNRS).

Research interests: consciousness, altered (e.g. coma, unresponsive wakefulness syndrome, minimally conscious state) and modified (e.g. hypnosis, trance) states of consciousness processes.



Arthur Courtin (representative from Université Catholique de Louvain)

Research Fellow (FRIA doctoral grant) from the Fund for Scientific Research - FNRS working at the Institute of Neuroscience of UCLouvain.

Research interest: thermociception, TRP channels, psychophysics, EEG.





ORGANISING COMMITTEE

Andrea Polli (representative from Vrije Universiteit Brussel)

PhD Research fellow from the Research Foundation - Flanders (FWO) at Vrije Universiteit Brussel - Department of Physiotherapy, Human Physiology and Anatomy and KULeuven - Department of Public Health and Primary Care.

Research interests: persistent pain, chronic fatigue syndrome, exercise, central nervous system, immune system, neuro-immune interactions, epigenetics.



Lotte Meert (representative from Antwerp University)

PhD Research Fellow from the Research Foundation - Flanders (FWO) at Antwerp University - Department of Rehabilitation Sciences and Physiotherapy.

Research interest: central nervous system mechanisms of pain - pain in knee osteoarthritis patients - chronic pain after total knee replacement surgery.



Cigdem Yilmazer (representative from Hasselt University)

PhD researcher at Hasselt University - Faculty of Rehabilitation Sciences.

Research interest: pain in multiple sclerosis, upper limb somatosensory deficits post-stroke.





PROGRAMME

- 11.30 - 13.25 Registration and Poster Viewing with Welcome Lunch and Coffee
Hall 71 Simonart
- 13.25 - 13.40 Welcome by the Belgian Pain Society and the Scientific Organizing Committee
Prof. Dr André Mouraux and Prof. Dr Jessica Van Oosterwijck
Auditorium 51 Maisin
- 13.40 - 15.10 Oral presentations
Parallel Oral Session I - Auditorium 51 Maisin
Parallel Oral Session II - Auditorium 51 B
- 15.10 - 15.30 Coffee break and poster viewing
Hall 71 Simonart
- 15.30 - 16.30 Poster Presentations
Hall 71 Simonart
- 16.30 - 18.15 Plenary session: Central sensitization, what are we actually talking about? A multidisciplinary hot topic debate
Moderator: Drs Andrea Polli
Auditorium 51 Maisin
- Introduction
 - Keynote presentation 1: What is central sensitization?
Emanuel Van den Broeke, basic scientist, PhD (UCLouvain)
 - Keynote presentation 2: Dealing with uncertainty: a clinical perspective on the concept of central sensitization
Sanneke Don, Physiotherapist, PhD (Vrije Universiteit Brussel)
 - Debate with the keynote speakers
- 18.15 - 18.30 Closing and awards ceremony
Prof. Dr André Mouraux and Drs Arthur Courtin
Auditorium 51 Maisin
- 18.30 - ... Networking event
Moderators: Drs Lotte Meert and Drs Cigdem Yilmazer
Hall 71 Simonart



#BPSYRD2





PROGRAMME

	Parallel Oral Session I - Auditorium 51 Maisin Moderator: Prof. Dr Jessica Van Oosterwijck	Parallel Oral Session II - Auditorium 51 B Moderator: Dr Audrey Vanhauzenhuysse
13.40	Risk factors for insomnia in chronic spinal pain patients: A systematic review and meta-analysis - Bilterys Thomas	Relationship between cognitive and emotional factors and healthcare utilization in patients experiencing pain: a systematic review - Huysmans Eva
13.53	Assessing Thermal Sensitivity Using Transient Heat And Cold Stimuli Combined With A Bayesian Adaptive Method In A Clinical Setting: A Feasibility Study – Courtin Arthur	Does fatigue have an influence on the nociceptive flexion reflex? A randomized cross-over study in healthy people - Dhondt Evy
14.06	Comparing the efficacy of five different conditioned pain modulation paradigms and the influencing effects of modifiable factors - Mertens Michel	Prevalence Of Signs Of Nociception During Physiotherapy In Patient With Disorders Of Consciousness - Bonin Estelle
14.19	The influence of High Dose Spinal Cord Stimulation on the descending pain modulatory system in patients with failed back surgery syndrome - De Grootte Sander	The association between pain intensity and disability in patients with failed back surgery syndrome, treated with spinal cord stimulation - De Jaeger Mats
14.32	Study of dropout in chronic pain : What factors play a role? - Bicego Aminata	The exploration-exploitation dilemma in pain - Krypros Angelos
14.45	Developing the network pain rehabilitation Limburg: results of a feasibility study - Lamper Cynthia	Using intracerebral EEG to characterize the modulations of insular ongoing oscillations exerted by sustained thermonociceptive and cool stimulation - Liberati Giulia
14.58	Functional expression and pharmacological modulation of nociceptor TRPM3 in human sensory neurons - Vangeel Laura	The impact of parental responses upon child pain behavior in the context of cancer-related painful procedures: the moderating role of parental self-oriented distress - Rheel Emma





PROGRAMME

	Poster Walk A	Poster Walk B	Poster Walk C	Poster Walk D	Poster Walk E
	Moderator: Drs Arthur Courtin	Moderator: Drs Andrea Polli	Moderator: Drs Cigdem Yilmazer	Moderator: Drs Lotte Meert	Moderator: Prof. Dr Jessica Van Oosterwijk
15.30	P1 Measuring Upper Limb Disability for Patients with Neck Pain: Evaluation of the Feasibility of the Single Arm Military Press (SAMP) Test - Aboalmaty Heba	P10 Measures Of Upper Limb Function For People With Neck Pain: A Systematic Review Of Measurement And Practical Properties - Alreni Ahmad	P19 Unravelling The Prognostic Role Of Socio-Cultural Factors In Patients With Non-Specific Musculoskeletal Pain In Primary Care Physiotherapy; The Cultural Pain Diversity (Cupid) Prospective Cohort Study - Annevelink Renske	P28 Peripheral Nerve Stimulation In The Treatment Of Sural Neuroma Pain: A Successful Case - Antunes Da Silva Patricia	P37 Association Between Work-Related Factors And Musculoskeletal Pain In Healthcare Workers: Moderating Role Of Pain Catastrophizing And Kinesiophobia - Keyaerts Stijn
15.36	P2 Investigating Brain Dynamics Underlying Reduced Habituation To Painful Stimuli In Migraine Using Dynamical Causal Modelling - Bassez Iege	P11 Investigating The Multisensory Influence Of Vision On Nociception-Induced Cortico-Spinal Excitability - Filbrich Lieve	P20 Pain-Related Fear Is Related To Glenohumeral Movement Variability During Unpredictable Reaching Tasks - De Baets Liesbet	P29 Associations Between Cognitive, Emotional And Behavioral Factors And Symptoms Of Central Sensitization In People With Non-Specific Low Back Pain In Primary Care: A Cross-Sectional Study - Den Brandt Hester	P38 Unravelling Shoulder- And Knee Pain And Related Disability: A Cross-Sectional Study Examining The Contribution Of Pathological, Pain Physiological And Psychological Factors - Van Loo Mark
15.42	P3 The Predictive Value Of Psychosocial Factors And Nociceptive Stimuli Processing On Pain And Disability In Chronic (Sub)-Acute Low Back Pain: A 3-Month Follow-Up Study - Foubert Anthe	P12 Mechanisms And Effectiveness Of Chiropractic Spinal Manipulation For Spine Pain - Gevers-Montoro Carlos	P21 The Effect Of Pain Education And Exercise Therapy On Motor Control, Lumbar Muscle Strength And Psychological Factors In Patients With Recurrent Low Back Pain - Goubert Dorien	P30 The Influence Of Physiological Factors On The Nociceptive Flexion Reflex In Healthy Adults: A Systematic Review And Meta-Analysis - Dhondt Evy	P39 Transcutaneous Electrical Nerve Stimulation Reduces Movement-Evoked Pain In People With Chronic Low Back Pain: A Randomised Crossover Study - Leemans Lynn
15.48	P4 Burst-Like Conditioning Electrical Stimulation Of Cutaneous Nociceptors Is More Efficacious Than Continuous Stimulation In Inducing Heterosynaptic Facilitation Of Mechanical Nociceptive Input In Humans - Gousset Solenn	P13 The Influence Of Nociceptive And Neuropathic Pain States On The Processing Of Acute Electrical Nociceptive Stimulation: A Dynamic Causal Modeling Study - Goudman Lisa	P22 The Effect Of Pain Neuroscience Education And Behavioural Graded Activity Compared To Usual Care On Chronic Pain In Breast Cancer Survivors: Protocol For A Randomised Controlled Trial - Lahousse Astrid	P31 The Effectiveness Of Pain Neuroscience Education On Postoperative Functioning In Breast Cancer Patients: A Randomized Controlled Trial - Van Der Gucht Elien	P40 Modulating Mechanisms In Patients With Chronic Subjective Tinnitus: A Study Protocol - De Meulemeester Kayleigh
15.54	P5 The Mediating Effect Of Perceived Injustice And Pain Catastrophizing In The Relationship Of Pain On Fatigue In Breast Cancer Survivors - Ivakhnov Sergei	P14 Transcranial Direct Current Stimulation In Primary Motor Cortex And Effects On Pressure Pain Threshold In Healthy Individuals: A Quasi-Experimental Single-Blind Sham-Controlled Trial - Guerin Mathias	P23 The Effectiveness Of Hands-Off Therapy In The Management Of Patients With Headache: A Systematic Review - Mukhtar Naziru Bashir	P32 The (Cost-) Effectiveness Of Primary Care For Patients With Chronic Musculoskeletal Pain Following Network Pain Rehabilitation Limburg: Protocol Of A Pragmatic Trial - Lamper Cynthia	P41 Pharmacological Characterization Of The Spinal A2-Adrenoceptors Subtypes Which Modulates The Nociception - Lopez Corodoba Gustavo
16.00	P6 Virtual Reality Distraction Induces Analgesia In Patients With Chronic Low Back Pain: A Randomized Controlled Trial - Matheve Thomas	P15 Effect Of Brain Training Through Visual Mirror Feedback, Action Observation, And Motor Imagery On Orofacial Sensorimotor Variables: A Single-Blind Randomized Controlled Trial - Herranz-Gomez Aida	P24 Protocol For A Randomized Controlled Trial: How Does Exercise Therapy For Knee Osteoarthritis Pain Work? - Puts Sofie	P33 Does Peak Alpha Frequency Predict Secondary Hyperalgesia? - Lebrun Louisien	P42 Chronic Pain In Ehlers-Danlos Syndrome: A Case Control Study Protocol To Reveal New Insights In Pain Symptomatology And Pathophysiology - Colman Marlies
16.06	P7 Using Hypnosis And Virtual Reality During Pre And Postoperative Cardiovascular Surgery - Rousseaux Floriane	P16 Exploring Pain, Body Composition And Physical Activity In Children With Cancer: A Case-Control Study - Rheel Emma	P25 Feasibility Of An Ultrasound-Guided Approach To Radiofrequency Ablation Of The Superolateral, Superomedial And Inferomedial Genicular Nerves: A Cadaveric Study - Vanneste Bert	P34 The Predictive Value Of Fear Avoidance Beliefs For Surgical Outcome Following Lumbar Degenerative Disease: Protocol Of A Systematic Review And Meta-Analysis - Van Bogaert Wouter	P43 A European Survey About Needs And Beliefs Of Healthcare And Family Caregivers Regarding Pain Assessment And Management In DOC Patients - Bonin Estelle
16.12	P8 The Association Between Central Sensitization And Sleep In Patients With Chronic Spinal Pain And Comorbid Sleep Problems: Secondary Analysis Of A Randomized Controlled Multicenter Trial - Siffain Carolien	P17 Transcutaneous-VNS and Nociception: electrophysiologic insight from the insula - Dumoulin Manon	P26 The Development And Measurement Properties Of The Dutch Version Of The Fear-Avoidance Component Scale - De Baets Liesbet	P35 Comparison Of Cooled Versus Conventional Radiofrequency Treatment Of The Genicular Nerves For Chronic Knee Pain: A Multicentre Randomised Controlled Non-Inferiority Pilot Trial (COCOGEN Trial) - Vanneste Thibault	P44 Localized Neuropathic Pain: Patch Or Pill? A Multicentre, Randomized, Open-Label, Comparative Study - Spaas Catheline
16.18	P9 Posterior Spinal Fusion Surgery For Adolescent Idiopathic Scoliosis: Implementation Of A Multidisciplinary Biopsychosocial Perioperative Care Model - Wildemeersch Davina	P18 The Cognitive Modulation Of Mechanical Hypersensitivity: Does Autonomic Arousal Play A Role? - Meyers Elke	P27 The Presence Of Central Sensitization In Chronic Idiopathic Neck Pain: A Study Protocol - Lenoir Dorine	P36 Effectiveness Of A Radiofrequency Treatment Of The Genicular Nerves In Chronic Knee Pain - Vanneste Thibault	P45 Posterior Spinal Fusion Surgery For Adolescent Idiopathic Scoliosis: Implementation of a Multidisciplinary Biopsychosocial Perioperative Care Model





ORAL PRESENTATION

STUDY OF DROPOUT IN CHRONIC PAIN: WHAT FACTORS PLAY A ROLE

Bicego Aminata^{1,2*}, Monseur Justine⁴, Rousseaux Floriane^{1,2}, Maron Louise³, Salamun Irène³, Malaise Nicole³, Collinet Alain⁵, Faymonville Marie-Elisabeth^{1,3}, Nyssen Anne-Sophie^{1,2}, Vanhauzenhuyse Audrey^{1,3}

1. University of Liège, Sensation and Perception Research Group
2. University of Liège, Cognitive Ergonomy and Work Intervention Department
3. Hospital University of Liège, Algology Department,
4. University of Liège, Public Health Department, Biostatistics
5. Musicothérapie & Counselling Liège

Background and Aims: Chronic pain concerns one in four adults in Belgium. Because of the psychological and social repercussions, a biopsychosocial approach is necessary in order to improve patients' quality of life. Patients and healthcare providers turn increasingly to non-pharmacological treatments such as hypnosis, music therapy, self-care, and psycho-education. However, a major problem in clinical research is patient dropout. The aim of this study is to identify profiles of patients more susceptible to dropout.

Method: 583 chronic pain patients (age \bar{X} =49,54, SD=13,31, 107 men) were included in this study. Exclusion criteria were : psychiatric and/or neurological disorders, drug addiction and/or alcoholism. 211 patients were randomized in 4 treatment groups: (i) hypnosis/self-care, (ii) music therapy/self-care, (iii) self-care, (iv) psycho-education. 372 patients were not randomized as they had the specific demand to learn self-hypnosis, they were part of a self-hypnosis/self-care motivation group. Socio-demographics, levels of anxiety, depression, fatigue intensity, mean pain, attitudes towards pain, locus of control and quality of life were assessed by means of standardized scales. In order to yield dropouts profiles, univariate analyses on baseline scores comparing dropouts and continuers were conducted in order to select variables to include in a binary logistic regression.

Results: The multivariate analyses retained two significant factors: degree level (i.e. high school; $p < 0.01$) and perceived control ($p = 0.01$).

Conclusion: Our study has some clinical relevance as our results suggest that by increasing perceived control over pain before starting the treatment, therapist might reduce dropout prevalence.

Funding bodies which supported the submitted research: the Benoit Foundation (Belgium), the Belgian Cancer Foundation (2017-064).





ORAL PRESENTATION

RISK FACTORS FOR INSOMNIA IN CHRONIC SPINAL PAIN PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

Bilteyrs Thomas¹⁻³, Siffain Carolie², De Maeyer Ina², Van Looveren Eveline¹⁻³, Mairesse Olivier^{4,5}, Nijs Jo^{1,2,6}, Meeus Mira^{1,3,7}, Danneels Lieven³, Ickmans Kelly^{1,2}, Cagnie Barbara³, Moens Maarten^{8,9}, Goubert Dorien³, Malfliet Anneleen^{1-3,6,10}

1. Pain in Motion International Research Group, <http://www.paininmotion.be>
2. Vrije Universiteit Brussel, Department of Physiotherapy, Human Physiology and Anatomy, Pain in Motion research group
3. Ghent University, Department of Rehabilitation Sciences and Physiotherapy
4. Vrije Universiteit Brussel, Experimental and applied Psychology
5. Brugmann University Hospital, Sleep Laboratory and Unit for Chronobiology
6. University Hospital Brussels, Department of Physical Medicine and Physiotherapy
7. University of Antwerp, Department of Rehabilitation Sciences and Physiotherapy (MOVANT)
8. University Hospital Brussels, Department of Neurosurgery and Radiology
9. Vrije Universiteit Brussel, Center for Neurosciences (C4N)
10. Research Foundation Flanders (FWO)

Background and Aims: Chronic pain concerns one in four adults in Belgium. Because of the psychological and social repercussions, a biopsychosocial approach is necessary in order to improve patients' quality of life. Patients and healthcare providers turn increasingly to non-pharmacological treatments such as hypnosis, music therapy, self-care, and psycho-education. However, a major problem in clinical research is patient dropout. The aim of this study is to identify profiles of patients more susceptible to dropout.

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Conclusion: Our study has some clinical relevance as our results suggest that by increasing perceived control over pain before starting the treatment, therapist might reduce dropout prevalence.

Funding bodies which supported the submitted research: Anneleen Malfliet is funded by the Research Foundation Flanders . Eveline Van Looveren and Thomas Bilteyrs are both funded by the Applied Biomedical Research Program (TBM) of the Agency for Innovation by Science and Technology (IWT) and the Research Foundation Flanders (FWO).





ORAL PRESENTATION

PREVALENCE OF SIGNS OF NOCICEPTION DURING PHYSIOTHERAPY IN PATIENT WITH DISORDERS OF CONSCIOUSNESS

Bonin Estelle A. C. ^{1,2}, Fossati Mariachiara L. B. ^{1,3}, Filippini Maria Maddalena ¹, Bornheim Stephen ⁴, Lejeune Nicolas ^{1,2,5,6}, Bodart Olivier ¹, Laureys Steven ^{1,2}, Thibaut Aurore ^{1,2+}, Chatelle Camille ^{1,2+}

+These authors share the last position

1. University of Liège, Coma Science Group, GIGA-Consciousness
2. Universitaire Liège, Centre du Cerveau (C2)
3. University of Pavia, Behavioral and Nervous System Sciences Department
4. University of Liège, Departement of Sport and Rehabilitation Sciences
5. Groupe Hospitalier Saint-Luc, CHN William Lennox
6. UCLouvain, Institute of Neurosciences

Background and Aims: Patients with disorders of consciousness (DOC) may suffer from neuro-orthopaedics disorders that can lead to potential pain during physiotherapy (PT). It is a real challenge for clinicians to assess pain and adapt treatment as these patients are unable to communicate. This randomized double-blind placebo-controlled study aimed to investigate the prevalence of signs of nociception during PT and their changes in relation to a pain-killer.

Methods: During baseline, pain responsiveness was assessed using the NCS-R (Nociception Coma Scale-Revised): at rest; during a tactile stimulation (TS); during a nociceptive stimulation (NS); and during PT. Then, patients with signs of potential pain during PT were assessed during a placebo and pain-killer conditions on two different days in a randomized order.

Results: 19 patients were enrolled, and 14 took part in the placebo-controlled trial. We found that most DOC patients present signs of potential pain during PT (14/19; 73.4%), and only a minority of them received analgesic treatment before the study (5/14, 35.7%). During baseline, we found significant higher NCS-R scores during PT than the three others conditions, suggesting that passive mobilizations are potentially painful for DOC patients. We did not found an effect of pain-killer on the NCS-R score during each condition. This could be explained by the fact that the NCS-R failed to detect the effect of pain-killer or that it was not effective to reduce pain.

Conclusions: This study pointed-out that PT may be painful for DOC patients and appropriate assessment and treatment before and during mobilizations should become a priority in clinical setting.

Funding bodies which supported the submitted research: the Benoit Foundation (Belgium), the Belgian Cancer Foundation (2017-064).





ORAL PRESENTATION

ASSESSING THERMAL SENSITIVITY USING TRANSIENT HEAT AND COLD STIMULI USING A BAYESIAN ADAPTIVE METHOD IN A CLINICAL SETTING: A FEASIBILITY STUDY

Courtin Arthur¹, Plaghki Léon¹, Caty Gilles², Maldonado-Slootjes Sofia¹, Mouraux André¹

1. Université catholique de Louvain, Institute of Neuroscience, NOCIONS
2. Cliniques Universitaires Saint-Luc

Background and Aims: Quantitative sensory testing of thermal detection abilities is widely used as a clinical tool to assess the function of pain pathways. The most common procedure to assess thermal sensitivity, the method of limits, provides a quick but rough estimate of the detection threshold. Here, we test the suitability of the psi method, an adaptive Bayesian algorithm, to estimate the threshold and slope of the psychometric functions for heat and cold detection.

Methods: A convenience sample of 15 patients with diabetes mellitus (DM) and 15 age-matched healthy controls (HC) was tested. Thirty brief (100 ms) stimuli of each modality were applied to the volar wrist and the foot dorsum. Cold and warm stimuli were delivered with a Peltier thermode and a temperature-controlled CO₂ laser, respectively. ROC analyses were used to assess the ability of slopes, thresholds and the combination of both to discriminate between groups.

Results: Assessment of the slope and threshold of the psychometric function for thermal detection took about 10 minutes. While the ability to detect warmth was not reduced in DM patients as compared to HC, cold detection performance assessed using slope or threshold parameters of the psychometric function separated DM patients from HC with a good discriminative power, which was further increased when both parameters were used together (93% sensitivity and 87% specificity), indicating that the two parameters provide complementary information on patient status.

Conclusion: The psi method is as time efficient and more informative than the method of limits for thermal detection assessment in patients.

Funding bodies which supported the submitted research: None.





ORAL PRESENTATION

THE INFLUENCE OF HIGH DOSE SPINAL CORD STIMULATION ON THE DESCENDING PAIN MODULATORY SYSTEM IN PATIENTS WITH FAILED BACK SURGERY SYNDROME

De Groote Sander ¹, Goudman Lisa ^{1,2}, Peeter Ronalds ³, Linderoth Bengt ⁴, Van Schuerbeek Peter ⁵, Sunaert Stefan ³, De Jaeger Mats ¹, De Smedt Ann ⁶, De Andrés José ⁷, Moens Maarten ^{1,5,8}

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5. Vrije Universiteit Brussel, Department of Physiotherapy, Human Physiology and Anatomy
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7. Karolinska Institutet, Department of Clinical Neuroscience
8. Universitair Ziekenhuis Brussel, Department of Radiology
9. Universitair Ziekenhuis Brussel, Department of Neurology
10. Valencia University Medical School, Surgical Specialties Department and General University Hospital, Department of Anesthesiology Critical Care and Pain Management
11. Vrije Universiteit Brussel, Center for Neurosciences (C4N)

Background and Aims: The descending pain modulatory system (DPMS) comprises an anatomical network of cortical, subcortical and brainstem regions that regulates nociceptive processing. Human studies provided evidence of the impact of SCS on the DPMS, resulting in inhibitory supraspinal effects. We hypothesized that high-dose (HD) SCS may alter the DPMS and thereby result in an inhibitory supraspinal effect of HD-SCS. In order to investigate the influence of HD-SCS on the DPMS, a hypothesis driven pilot study with resting state fMRI was performed in patients with chronic back and/or leg pain, treated with HD SCS.

Methods: Resting state fMRI imaging was obtained from eleven patients with failed back surgery syndrome who were eligible for HD-SCS. Specifically chosen regions of interest of the DPMS have been investigated over time. Baseline measurements were compared with measurements during HD-SCS. Additionally, clinical parameters on pain intensity, pain catastrophizing and sleep quality were correlated with functional connectivity strengths.

Results: The study results demonstrated an increased connectivity over time between the middle frontal gyri and the insula/rostroventral medulla. An increased interhemispheric connectivity between both middle frontal gyri was revealed. A decreased connectivity was found between the anterior cingulate cortex and the insula. No statistically significant correlations were found between clinical outcomes and functional connectivity strengths.

Conclusion: These findings support the hypothesis that HD-SCS might influence the DPMS, by an increase of the strengths in functional connectivity in DPMS related regions during stimulation.

Funding bodies which supported the submitted research: This study was supported by Medtronic Europe Sarl that provided a research grant. Medtronic was not involved in the collection and analysis of the data or in writing the manuscript. The Actiwatches Spectrum Plus has been funded by the "Wetenschappelijke Fonds Willy Gepts of the UZ Brussel".





ORAL PRESENTATION

DOES FATIGUE HAVE AN INFLUENCE ON THE NOCICEPTIVE FLEXION REFLEX? A RANDOMIZED CROSS-OVER STUDY IN HEALTHY PEOPLE

Dhondt Evy^{1,2}; Danneels Lieven¹, Van Oosterwijck Sophie¹⁻³, Palmans Tanneke¹, Rijckaert Johan^{1,4}, Van Oosterwijck Jessica¹⁻³

1. Ghent University, Department of Rehabilitation Sciences, SPINE Research Unit Ghent
2. Pain in Motion international research group
3. Research Foundation - Flanders (FWO)
4. Artevelde University College, Department of Audiology

Background and Aims: The nociceptive flexion reflex (NFR) is a spinally-mediated withdrawal reflex occurring in response to noxious stimuli and is used as an electrophysiological marker of spinal nociception. Although it is well documented that the NFR is subject to powerful modulation of several personal factors, the effects of experimentally induced fatigue on the NFR have not yet been examined. Hence, this study aimed to characterize if and how fatigue affects spinal nociception in healthy adults.

Methods: The NFR of 58 healthy people was measured prior to and following rest and two fatigue inducing tasks performed in randomized order. The NFR was elicited by transcutaneous electrical stimulation of the sural nerve and objectified by electromyographic recordings from the biceps femoris muscle. An isokinetic fatiguing protocol was used as the physical task aimed at inducing muscular fatigue of the hamstrings. The modified incongruent Stroop-word task was used as the cognitive task to provoke mental fatigue. A linear mixed model analysis was performed to assess the influence of fatigue on the NFR.

Results: Experimentally induced physical and mental fatigue did not affect the NFR. These results suggest that descending pain inhibitory processes to dampen spinal nociception are resistant to the effects of physical and mental fatigue.

Conclusion: The relative robustness of the NFR to fatigue is beneficial in both clinical and research settings when the influence of confounding factors is unwanted. Furthermore, the findings possibly help enhance our understanding on why exercise-based and cognitively demanding treatment programs form effective treatment strategies for patients with chronic pain.

Funding bodies which supported the submitted research: Jessica Van Oosterwijck is a post-doctoral research fellow funded by the Research Foundation – Flanders (FWO) [12L5619N and 12L5616N]. Sophie Van Oosterwijck is a PhD research fellow funded by the Research Foundation – Flanders (FWO) [11A8620N].





ORAL PRESENTATION

THE ASSOCIATION BETWEEN PAIN INTENSITY AND DISABILITY IN PATIENTS WITH FAILED BACK SURGERY SYNDROME, TREATED WITH SPINAL CORD STIMULATION

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Background and Aims: Pain researchers demonstrated that pain intensity is not the most reliable measure of the success of chronic-pain treatment. Several research groups have proposed “core outcome domains”, such as measurements of disability, to assess the effect of an intervention. Nevertheless, studies investigating the relation between pain intensity and disability in patients treated with spinal cord stimulation (SCS) are lacking. Therefore, the goal is to examine which pain-reporting strategy, routinely used in pain research, associates best with the degree of disability in these patients.

Methods: Eighty-one failed back surgery syndrome patients (37 males and 44 females, mean age 54.6 years), treated with high-dose spinal cord stimulation (HD-SCS) are recruited. Pain intensity was scored on an 11-point numerical rating scale (NRS) for leg and back pain, while disability was assessed with the Oswestry disability index (ODI). The association between both variables was investigated with Spearman’s correlation and Cramer’s V.

Results: Significant correlations ($p < 0.001$) are found between the absolute and relative differences of the ODI and NRS. Significant associations were found between reported cut-offs in literature and the degree of disability. Finally, a significant association ($p < 0.001$) was found between the minimal clinical important difference.

Conclusion: This study, we showed that the degree of disability was strongly associated with the pain intensity as measured using different methods. The standard method for reporting pain intensity reduction (50%) seems to associate the strongest with the degree of disability. However, a low degree of disability does not always reflect a low pain intensity.

Funding bodies which supported the submitted research: The study was supported by Medtronic Europe Sarl that provided a research grant. Medtronic was not involved in the collection and analysis of the data or in writing the manuscript.





ORAL PRESENTATION

RELATIONSHIP BETWEEN COGNITIVE AND EMOTIONAL FACTORS AND HEALTHCARE UTILIZATION IN PATIENTS EXPERIENCING PAIN: A SYSTEMATIC REVIEW

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Background and Aims: Pain conditions are among the leading causes of global disability, impacting on global healthcare utilization (HCU). This healthcare seeking behavior, which is – especially in chronic pain – often excessive, might be influenced by cognitive and emotional factors (CEF). Therefore, we aimed to provide an overview of the literature concerning associations between CEF and HCU in terms of amount and type of HCU and adherence to recommendations in patients experiencing pain.

Methods: Systematic search was conducted in PubMed, Web of Science and EconLit (final search: 6/08/2019). Full-text articles investigating the relationship between CEF and HCU in adults experiencing pain were eligible for inclusion. Downs & Black checklist (modified) was used for critical appraisal. Screening procedures were performed by 2 reviewers independently.

Results: Based on the 100 included publications (total sample n=70,038), there was evidence for a positive association between symptoms of anxiety and depression and the amount of pain medication use, and opioid use in particular, and non-adherence to medication recommendations. Furthermore, anxiety symptoms, catastrophizing and pain-related fear showed a positive relationship with having healthcare consultations. For other relationships no evidence was found, or they showed inconsistent findings or were insufficiently studied to draw firm conclusions. However, for the latter, some of the limited results showed associations meeting our expectations, indicating that more research on this topic is needed.

Conclusions: Based on the evidence for relationships between CEF and HCU, it could be suggested that implementing interventions specifically tackling maladaptive CEF, could decrease excessive HCU related to pain.

Funding bodies which supported the submitted research: Eva Huysmans is a predoctoral research fellow of the Research Foundation Flanders (FWO), Belgium. Kelly Ickmans is a postdoctoral research fellow of the Research Foundation Flanders (FWO), Belgium.





ORAL PRESENTATION

THE EXPLORATION-EXPLOITATION DILEMMA IN PAIN

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Background and Aims: Everyday life operates as a chain of decisions, where individuals have to choose between alternative options. In such situations, an individual may choose based on what s/he already knows (exploitation), or search for alternative options (exploration).

Methods: Across two experiments, we tested the exploration-exploitation dilemma when individuals have to avoid painful stimuli and/or approach rewarding cues. Participants completed a 4-bandit task, where they had to choose with a joystick, one of four squares, with each square being associated with different probabilities of receiving a painful shock and/or receiving a momentary reward. Statistical analyses involved the use of different reinforcement models that emphasize the integration of information in terms of punishments (i.e., the painful stimulus) and/or rewards (i.e., the momentary rewards) learning rates, as well as the sensitivity to rewards or punishment (i.e., how much someone expects to like not receiving a painful stimulus or dislikes receiving a painful stimulus).

Results: Results showed that individuals learned faster to switch their choices after receiving a painful stimulus and/or missing a reward but were slower in learning about the choices that were a reward. At the same time, participants weighted the reception of rewards more heavily than avoiding the painful stimuli. These results could encourage the further use of rewards in clinical interventions for chronic pain.

Conclusions: All in all, the deeper understanding of the exploration-exploitation dilemma may be helpful in understanding decision making in the context of pain, an issue of importance for individuals and the society.

Funding bodies which supported the submitted research: This research is supported by an FWO grant appointed to Prof. Johan Vlaeyen, Prof. Geert Crombez, and Dr. Nathalie Claes.





ORAL PRESENTATION

USING INTRACEREBRAL EEG TO CHARACTERIZE THE MODULATIONS OF INSULAR ONGOING OSCILLATIONS EXERTED BY SUSTAINED THERMONOCICEPTIVE AND COOL STIMULATION

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Background and Aims: The human insula is a target for spinothalamic input, but there is still no consensus on its role in pain perception. Using intracerebral electroencephalography (iEEG) recorded from epileptic patients, we recently observed that sustained periodic thermonociceptive stimuli selectively modulated theta- and alpha-band ongoing oscillations recorded from the insula (Liberati et al., NeuroImage 2019). These modulations, however, are not necessarily pain-specific, as they could be simply related to the activation of the spinothalamic system, and/or to the conveyance of thermal information. The aim of the present study is to disentangle these aspects by comparing the effects of sustained periodic thermonociceptive stimulation (painful) and sustained periodic cool stimulation (non-painful) on insular ongoing oscillatory activity.

Methods: Four patients undergoing iEEG (29 insular contacts) participated in the experiment. Each participant received two blocks of sustained periodic stimuli (painful thermonociceptive stimuli and non-painful cool stimuli; frequency: 0.2 Hz). The order of the blocks was randomized across participants.

Results: In all patients, both thermonociceptive and cool stimuli elicited an increase of EEG power at the frequency of stimulation (0.2 Hz). However, only thermonociceptive stimuli exerted a 0.2 Hz modulation of ongoing oscillations in the theta and alpha frequency bands.

Conclusions: These preliminary findings suggest that the modulation of theta and alpha oscillations exerted by thermonociceptive stimuli are not merely related to the activation of the spinothalamic system and/or to the conveyance of thermal information, but could be more strongly related to pain perception.

Funding bodies which supported the submitted research: Giulia Liberati and Dounia Moulder are funded by the Fund for Scientific Research - FNRS. Arthur Courtin is funded by a FRIA doctoral grant from the Fund for Scientific Research – FNRS.





ORAL PRESENTATION

COMPARING THE EFFICACY OF FIVE DIFFERENT CONDITIONED PAIN MODULATION PARADIGMS AND THE INFLUENCING EFFECTS OF MODIFIABLE FACTORS

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Background and Aims: Conditioned pain modulation (CPM) methods are experimental procedures to assess presumed descending nociceptive modulatory pathways. Various CPM-methods are currently used, making the comparison of results difficult. The aim of this study was to compare five conditioning stimuli and to evaluate the influencing effects of modifiable individual factors on CPM-efficacy.

Methods: 101 healthy pain-free adults participated in this cross-sectional study with repeated measures design. The CPM protocol consisted of hot water immersion (46°C), cold pressor test (12°C), single ischemic occlusion, double ischemic occlusion, and cold pack application as conditioning stimuli in randomized order. Pressure pain threshold was used as test stimulus at the mm. trapezius and quadriceps for all CPM-protocols.

Results: All CPM-protocols resulted in effective CPM, although the cold pack revealed smaller CPM-magnitudes at the mm. trapezius and quadriceps. A smaller CPM-effect at the m. trapezius was shown when CPM was provoked by single or double ischemic occlusion in comparison with the cold pressor test. Attention towards the conditioning stimuli and perceived intensity affected CPM assessed at both the mm. trapezius and quadriceps. Chronic stress influenced CPM at m. trapezius and physical activity level in females and pain catastrophizing affected CPM at the m. quadriceps.

Conclusion: All applied protocols evoked CPM. However, cold pack application seems inferior and is not advised for future CPM-protocols. The cold pressor test appears superior and is recommended for research settings. Attention and perceived intensity affect CPM, but other individual modifiable factors might depend on the submitted protocol including conditioning stimulus and test site.

Funding bodies which supported the submitted research: Jessica Van Oosterwijck is a post-doctoral research fellow funded by the Research Foundation – Flanders (FWO).





ORAL PRESENTATION

THE IMPACT OF PARENTAL RESPONSES UPON CHILD PAIN BEHAVIOR IN THE CONTEXT OF CANCER-RELATED PAINFUL PROCEDURES: THE MODERATING ROLE OF PARENTAL SELF-ORIENTED DISTRESS.

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Background and Aims: Research has shown that certain types of parental responses may negatively impact child pain outcomes whereas other responses may promote child coping behavior. Findings have shown that parental protective or pain-attending responses contribute to increased child pain and distress. Conversely, parental non-pain attending or distracting behavior may promote child adaptive coping. However, evidence the impact of these type of parental responses is not unequivocal. An affective-motivational account on interpersonal pain dynamics suggests that parental emotions may underlie differential effects of seemingly similar types of responses with deleterious child outcomes being most pronounced when parental caregiving is driven by self-oriented emotions (i.e., parental distress). The current study investigated the moderating role of parental distress in understanding the impact of parental responses (i.e., protective and coping promoting responses) upon child pain behavior.

Methods: Participants consisted of 46 children with leukemia (0.6-15y), undergoing a lumbar puncture or bone marrow aspiration, and one of their parents. Parent-child interactions were videotaped immediately after the procedure and parents reported on experienced personal distress.

Results: Moderation analyses indicated a positive association between parental protective behavior and child pain behavior but only for parents who reported high levels of personal distress. No association was observed amongst parents who reported low levels of distress. Parental coping promoting behavior was not associated with child pain behavior, nor was this relationship moderated by parental self-oriented distress.

Conclusions: The current findings point to the critical role of addressing parental emotions as being key to promote more optimal pain-related outcomes.

Funding bodies which supported the submitted research: Grant support for Emma Rheel was provided by a Chair funded by the Berekuyt Academy/European College for Decongestive Lymphatic Therapy, the Netherlands, and awarded to the Vrije Universiteit Brussel, Belgium.





ORAL PRESENTATION

DEVELOPING THE NETWORK PAIN REHABILITATION LIMBURG: RESULTS OF A FEASIBILITY STUDY

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Background and Aims: Rehabilitation care for chronic musculoskeletal pain (CMP) face challenges as mismatches exist between the complexity of patient's pain problem and the treatment offered which can lead to less efficient care and increased costs. The Network Pain Rehabilitation Limburg (NPRL) is a transmural integrated healthcare network designed to provide integrated care to improve patients' level of functioning despite pain from a biopsychosocial perspective. This feasibility study provides insight into the barriers and facilitators for the development, implementation, and transferability of NPRL.

Methods: In this study with a three-phase iterative and user-centered design, interviews (n=5) and focus groups (n=6) were performed in which 7 physiotherapists, 1 exercise therapist, 1 practice nurse mental health primary care, 3 general practitioners, 4 rehabilitation physicians, 1 physician assistant, 1 nurse practitioner, 1 psychologist, 1 treatment coach tertiary care, and 6 patients involved in NPRL, participated. The results of each phase were analyzed following the Consolidated Framework for Implementation Research.

Results: A limited number of participating healthcare professionals, the current organization of care in the Netherlands, and a hampered attitude towards a biopsychosocial treatment of both healthcare professionals as patients hinders trialability and implementation of NPRL. However, the developed protocols are facilitators because they stimulate alignment of expectations of healthcare professionals and increases effectivity of NPRL. Additionally, the design of this study stimulates appropriate implementation in daily care.

Conclusions: Successful implementation of innovations in health service delivery and organization takes time.

Funding bodies which supported the submitted research: Healthcare insurances CZ, VGZ and Zilveren Kruis.





ORAL PRESENTATION

FUNCTIONAL EXPRESSION AND PHARMACOLOGICAL MODULATION OF NOCICEPTOR TRPM3 IN HUMAN SENSORY NEURONS

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Background and Aims: Somatosensory Transient Receptor Potential (TRP) channels are the molecular sensors in the nerve terminals of sensory neurons. One particular member, TRPM3, is a noxious heat sensor and plays a key role in acute pain sensation and inflammatory hyperalgesia in rodents. This suggests TRPM3 as potential novel analgesic drug target. However, little is known about expression, function and modulation of the channel in human.

Methods: In this study, we used freshly isolated human dorsal root ganglion (hDRG) neurons in combination with human stem cell-derived sensory (hSCDS) neurons to study TRPM3 channel function.

Results: We detect expression of pain channel TRPM3 in a high percentage of neurons of both models. Ca²⁺ currents induced by pregnenolone sulphate (PS) or chemical agonist CIM0216 could be inhibited by known antagonists Isosakuranetin or Primidone. In a subset of hSCDS neurons, PS-induced TRPM3 responses were inhibited by the G $\beta\gamma$ subunits of heterotrimeric G-proteins like μ -opioid and GABAB receptors.

Conclusions: These results provide the first evidence of a functional expression of pain channel TRPM3 in human sensory neurons, with properties resembling TRPM3 in mouse DRGs. Given the important results in rodent pain models, this is a great encouragement to target TRPM3 in nociceptive drug development. Additionally, the hSCDS neurons present a valuable in vitro tool for studying human TRPM3 modulation and pharmacology.

Funding bodies which supported the submitted research: This research was supported by grants from the VIB, KU Leuven Research Council (C1-TRPLe to T.V.), the Research Foundation-Flanders (FWO G.084515N to J.V. and T.V.), the Queen Elisabeth Medical Foundation for Neurosciences (to T.V.), the Belgian Foundation Against Cancer (to J.V. and T.V.) and the Planckaert-De Waele fund (to J.V.).





POSTER PRESENTATION

MODULATING MECHANISMS IN PATIENTS WITH CHRONIC SUBJECTIVE TINNITUS: A STUDY PROTOCOL

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Background and Aims: Chronic subjective tinnitus (CST) is defined as a clinically heterogeneous auditory symptom, which can have a large impact on the quality of life of the patient. This prevalent symptom can be modulated by several mechanisms, such as neuroplasticity, musculoskeletal dysfunctions and cognitive-behavioral factors, which are also important contributing mechanisms in chronic pain. The first aim of this project is to elaborate on these mechanisms by evaluating these both objectively and clinically and to compare these measures between patients with CST with or without chronic musculoskeletal pain, patients with chronic musculoskeletal pain alone and healthy controls. A second aim is to identify which factors modulate tinnitus characteristics and their interrelations.

Methods: Tinnitus characteristics (localization, pitch, intensity, distress), musculoskeletal dysfunctions (clinical examination of neck and jaw region, muscle shear wave elastography, range of motion analysis by Qualisys), signs of central sensitization (questionnaire and Quantitative Sensory Testing protocols) and cognitive-behavioral factors (questionnaires and activity tracking) will be assessed in all groups.

Implications: Treatment approach of CST lacks therapeutic efficacy, probably due to a lack of differentiation and targeting of modulating mechanisms within this heterogeneous patient group. Identifying which (combinations of) modulating factors mostly contribute to the tinnitus characteristics will enable us to target these specific factors during treatment. In addition, when clinical tests show high correspondence with objective measurements, a reliable set of clinical tests can be introduced in clinical practice. This way, the assessment and treatment of CST could be optimized, leading to a decrease of tinnitus-related disability.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

MECHANISMS AND EFFECTIVENESS OF CHIROPRACTIC SPINAL MANIPULATION FOR SPINE PAIN

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Background and Aims: Spine pain is the first cause of disability worldwide, accounting for up to 11% of the total years lived with disability. Chiropractic care may be considered a safe and effective option for the management of a large proportion of these patients. This review aims at highlighting the most relevant mechanisms of pain relief by spinal manipulation and reviewing current evidence on the effectiveness of spinal manipulative therapy (SMT) for managing neck pain (NP) and low back pain (LBP). Finally, a perspective will be provided on future research in the field of spine pain and pain relief by SMT.

Methods: This narrative review presents results from the most recent randomized clinical trials, systematic reviews and meta-analyses, along with the recommendations from current clinical practice guidelines (CPG).

Results: Basic studies suggest that chiropractic SMT can relieve pain through a combination of mechanisms. While segmental mechanisms of pain inhibition contribute at least partly to the hypoalgesic effects produced by SMT, the evidence is weak regarding peripheral and cerebral mechanisms of pain inhibition, which are essential to the development of chronic pain. The literature available on the effectiveness of SMT for NP and LBP is abundant, but the quality of the evidence is still insufficient. Evidence suggests that thoracic SMT is effective for managing acute NP. Besides, recent reviews suggest that SMT is as effective as recommended therapies such as exercise for chronic LBP. Accordingly, there is a trend in recent CPG to recommend SMT, particularly for LBP.

Funding bodies which supported the submitted research: Fondation de Recherche en Chiropratique du Québec; Fonds de Recherche du Québec en Santé (FRQS); Natural Science and Engineering Research Council of Canada; Canadian Institutes of Health Research





POSTER PRESENTATION

THE EFFECT OF PAIN EDUCATION AND EXERCISE THERAPY ON MOTOR CONTROL, LUMBAR MUSCLE STRENGTH AND PSYCHOLOGICAL FACTORS IN PATIENTS WITH RECURRENT LOW BACK PAIN

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Background and Aims: Exercise in combination with education, explaining low back pain (LBP) as a benign phenomenon, seems effective in patients with chronic LBP. It is therefore hypothesized that patients with recurrent LBP might also benefit from such a pain education program.

Methods: Therefore, a single blinded randomized controlled trial was set up. Sixty eligible patients with recurrent LBP were allocated to one of three treatment arms: (1) a “pain education” group (n=20) receiving 2 weekly individual sessions of pain education, (2) a “pain education combined with exercise” group (n=20) receiving 2 weekly individual sessions of pain education followed by 5 weekly individual sessions of exercise therapy and (3) a “control” group (n=20) not receiving a treatment.

In all groups, lumbar motor control, muscle strength and psychological factors were assessed at baseline and after 7 weeks. Motor control was evaluated by the movement control test of Luomajoki, a lumbopelvic position-reposition test and a clinical dissociation test. The muscle strength of the lumbar flexors and extensors was assessed by a hand held dynamometer. Kinesiophobia, catastrophizing for pain and pain coping are investigated by the Tampa Scale for Kinesiophobia, the Pain Catastrophizing Scale and the Multidimensional Pain Inventory.

Baseline characteristics will be compared by a Mann–Whitney-U or chi-square test. Further analyses will be performed on an intention-to-treat basis and the improvement in outcome measures will be presented by the mean change. Finally, the between group changes will be compared using the Mann–Whitney-U test and effect sizes will be calculated.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

THE INFLUENCE OF NOCICEPTIVE AND NEUROPATHIC PAIN STATES ON THE PROCESSING OF ACUTE ELECTRICAL NOCICEPTIVE STIMULATION: A DYNAMIC CAUSAL MODELING STUDY

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Background and Aims: Despite the worldwide increase in prevalence of chronic pain and the subsequent scientific interest, researchers studying the brain and brain mechanisms in pain patient have not yet clearly identified the exact underlying disease. Quantifying the neuronal interactions in electrophysiological data, could help us gain insight into the complexity of chronic pain. Therefore, the aim of this study is to examine how different underlying pain states affect the processing of nociceptive information.

Methods: Twenty healthy participants, 20 patients with non-neuropathic low back-related leg pain and 20 patients with neuropathic failed back surgery syndrome received painful electrical stimulation at the right sural nerve with simultaneous electroencephalographic recordings. Dynamic Causal Modeling (DCM) was used to infer hidden neuronal states within a Bayesian framework.

Results: Pain intensity ratings and stimulus intensity of the nociceptive stimuli did not differ between groups. Compared to healthy participants, both patient groups had the same winning DCM model, with an additional forward and backward connection between the somatosensory cortex and right dorsolateral prefrontal cortex. The additional neuronal connection with the prefrontal cortex as seen in both pain patient groups could be a reflection of the higher attention towards pain in pain patients and might be explained by the higher levels of pain catastrophizing in these patients.

Conclusion: In contrast to the similar pain intensity ratings of an acute nociceptive electrical stimulus between pain patients and healthy participants, the brain is processing these stimuli in a different way.

Funding bodies which supported the submitted research: This study was partly funded by the Applied Biomedical Research Program of the Agency for Innovation by Science and Technology, Belgium.





POSTER PRESENTATION

TRANSCRANIAL DIRECT CURRENT STIMULATION IN PRIMARY MOTOR CORTEX AND EFFECTS ON PRESSURE PAIN THRESHOLD IN HEALTHY INDIVIDUALS: A QUASI-EXPERIMENTAL SINGLE-BLIND SHAM-CONTROLLED TRIAL

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Background and Aims: Transcranial direct current stimulation (tDCS) devices have emerged in the past few years, providing important benefits in pain management that could be used in routine clinical practice. Although tDCS has shown interesting results, further studies are warranted regarding its effect on somatosensory variables.

Methods: The main aim of the present study was to assess the short-term effects of active- tDCS (a-tDCS) in the primary motor cortex (M1) on pressure pain threshold. compared with a sham-tDCS (s-tDCS) in healthy individuals. This trial was a quasi-experimental, single-blind, sham-controlled study. A total of 100 participants were included. Fifty of the participants received the a-tDCS, whereas the remaining 50 received the s-tDCS. PPT was assessed before and after the tDCS application.

Results: The a-tDCS intervention was not significantly superior to the s-tDCS. However, significant within-group pre- and postintervention differences were found in the a-tDCS, in the PPT of the lower limb, with a small effect size ($p = .001$, $d = -0.17$).

Conclusion: This study showed no significant between-group differences in PPT outcomes. A single session of tDCS in isolation appears to produce immediate changes in healthy participants; however, these effects were very small.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

THE MEDIATING EFFECT OF PERCEIVED INJUSTICE AND PAIN CATASTROPHIZING IN THE RELATIONSHIP OF PAIN ON FATIGUE IN BREAST CANCER SURVIVORS

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Background and Aims: Recent insights and multidimensional aspects of pain have raised the awareness about cognitive appraisals, such as perceived injustice (PI) and pain catastrophizing (PC). It has been demonstrated that both play an important role as determinants in the pain experience of the patient. However, so far, the mediating effect of these appraisals has not been investigated concurrently in breast cancer survivors (BCS), nor have they been related to fatigue.

Methods: Cross-sectional data from 110 BCS were analysed by structural path analyses with the aim to examine the possible mediating effect of PI and PC in the relationship between pain and fatigue.

Results: Significant direct effects of PI, PC and pain (CSI) on fatigue were found. The indirect mediating effect of PI was found significant for both pain measures (CSI*PI = 0.23; $P < 0.01$ and VAS*PI = 1.38; $P < 0.05$) on fatigue. For PC, on the contrary, only pain measured by VAS (VAS*PC = 1.02; $P = 0.02$) demonstrated a significant relation. An increase in pain might lead to increased cognitive appraisals that, in turn increase the fatigue.

Conclusion: The importance of PI and PC as mediators of the relationship of pain on fatigue after cancer treatment not only highlights the fact that both cognitive appraisals are understudied but also open new perspectives regarding treatment strategies in BCS. The results of our study warrant replication across longitudinal studies to clarify the dissimilarities with other study findings, but continue to expand upon the evidence of the multifactorial nature of pain coping.

Funding bodies which supported the submitted research: This work is partially funded by the Berekuyf Academy Chair, funded by the European College for Lymphatic Therapy, the Netherlands, and awarded to Jo Nijs, Vrije Universiteit Brussel, Belgium. Laurence Leysen is a postdoctoral research fellow appointed on 2 funded projects by the Research Foundation Flanders (FWO; G007217 & G040919N), Belgium. Astrid Lahousse is a PhD fellow funded by FWO (11B1920N).





POSTER PRESENTATION

ASSOCIATION BETWEEN WORK-RELATED FACTORS AND MUSCULOSKELETAL PAIN IN HEALTHCARE WORKERS: MODERATING ROLE OF PAIN CATASTROPHIZING AND KINESIOPHOBIA

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Background and Aims: Musculoskeletal pain (MSP) is common in healthcare workers. In their job, they are exposed to potential physical and psychosocial risk factors. Maladaptive pain-related cognitions, such as pain catastrophizing (PC) and fear of movement (FOM), also play an important role in MSP. However, knowledge is lacking concerning the role of pain-related cognitions in amplifying or attenuating the impact of work-related factors on MSP. Therefore, this study aimed at studying 1) the association between work-related factors and pain-related cognitions and MSP 2) the moderating role of PC and FOM on the association between work-related factors and MSP among healthcare workers.

Methods: In this cross-sectional study, 405 healthcare workers (e.g. nurses and paramedics) from several Belgian companies filled out a questionnaire including socio-demographic factors, work-related factors (social support, autonomy, mental and physical workload), PC, FOM and MSP during the past year. Logistic regression analyses were used to test the hypotheses.

Results: Complaints were most frequent located in the neck (79%) and low back (71%). Physical and mental workload, FOM and PC were positively associated with MSP ($p < .05$). Healthcare workers who experienced high social support at work were less likely to have MSP ($p < .05$). Regarding the moderating effects, FOM interacts with workload, autonomy and social support on MSP ($p < .05$).

Conclusion: Work-related factors as well as pain-related cognitions are related to MSP in healthcare workers. FOM is an important moderator in this relationship. So, the presence of FOM should be considered in the occupational evaluation and monitoring of healthcare workers with MSP.

Funding bodies which supported the submitted research: Idewe (External Service for Prevention and Protection at Work), Leuven, Belgium.





POSTER PRESENTATION

THE EFFECT OF PAIN NEUROSCIENCE EDUCATION AND BEHAVIOURAL GRADED ACTIVITY COMPARED TO USUAL CARE ON CHRONIC PAIN IN BREAST CANCER SURVIVORS: PROTOCOL FOR A RANDOMISED CONTROLLED TRIAL

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Background and Aims: Chronic pain in breast cancer survivors (BCS) is of a considerable concern as it impacts the health-related quality of life (HRQoL) and activities of daily living negatively. Over the past decades, awareness has raised on the value of pain neuroscience education (PNE) in chronic pain. However, pain education remains underused in oncology and is often restricted to the biomedical management, which falls short in explaining persistent pain following cancer. Since PNE alone has rather small effect sizes, it should ideally be combined with a physical part, 'behavioural graded activity' (BGA). Therefore, the purpose of this study is to investigate the effectiveness of PNE with BGA compared to usual care on chronic pain in BCS.

Methods: A two-arm, double-blinded trial will be conducted in which 200 BCS with persistent pain will be randomly assigned to the intervention or usual care group. The intervention group will receive a 12-week treatment program that consists of 6 sessions, in which PNE and BGA will be integrated. Whereas, the usual care group will receive an information leaflet regarding "Pain in and after cancer". The primary outcome is pain, the secondary outcomes are endogenous hyperalgesia and HRQoL and the explanatory outcomes are mediators that might impact pain intensity of participants. All these will be assessed at baseline, immediate, 3 and 12 months post-treatment.

Hypotheses and possible implications: We hypothesise that PNE and BGA will lead to more beneficial pain outcomes compared to usual care in BCS with persistent pain. If so, it might lead to a treatment optimization of chronic pain in BCS.

Funding bodies which supported the submitted research: Astrid Lahousse is an aspirant researcher and was granted as PHD fellowship by Fund for Scientific Research-Flanders (FWO, <http://www.fwo.be/en>) (11B1920N).





POSTER PRESENTATION

NEGOTIATING (DIS)ABILITY: CHALLENGES IN PATIENT–PRACTITIONER INTERACTION IN THE CONTEXT OF CHRONIC PAIN REHABILITATION

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Background and Aims: Chronic pain rehabilitation aims to enable patients to cope with their pain more resiliently. However, conversations with patients about how they could deal with their pain differently can be challenging, as patients may emphasize their disabilities. This study explores how pain-related disability is negotiated in conversations between patients with chronic musculoskeletal pain and their practitioners. **Theoretical framework:** The study takes a discursive psychological (DP) perspective. DP is concerned with how people construct social realities through talk, and with how participants in interaction – often subtly – perform social actions (e.g., making requests or complaining). The focus is especially on how participants in a conversation manage potentially sensitive issues, such as accountability and blame.

Methods: Audio recordings of nine admission interviews (collected at rehabilitation units in the Netherlands) were transcribed and analysed according to the analytical procedures for DP research.

Results: Disability is negotiated by patients and practitioners throughout the interviews. Patients construct their inability to perform certain actions as factual and consequential to their pain. They present adjustments in their behaviour as an inevitable outcome of what their pain and body permit. Practitioners may challenge such representations by (1) constructing patients' behaviour as insufficiently accounted for and (2) proposing treatment directions that imply that patients could become more active. Both patients and practitioners orient to the potential delicacy of their talk.

Conclusions: The analysis provides insights into the elements in the interaction that participants themselves treat as sensitive. These insights can help practitioners to further develop their communication practices.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

MEASURES OF UPPER LIMB FUNCTION FOR PEOPLE WITH NECK PAIN: A SYSTEMATIC REVIEW OF MEASUREMENT AND PRACTICAL PROPERTIES

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Background and Aims: There is a strong relationship between neck pain (NP) and upper limb disability (ULD). Consequently, appropriate management of NP should incorporate upper limb rehabilitation and therefore include the use of an ULD measure in the diagnostic and therapeutic processes. Clear guidance regarding the suitability of available measures does not exist. The aim of this study was to identify all available measures of ULD for populations with NP, critically evaluate their measurement properties and finally recommend a list of suitable measures.

Method: This two-phase systematic review is reported in accordance with the PRISMA statement. Phase one identified all available measures of ULD for patients with NP. Phase two identified evidence for their measurement properties.

Results: A total of 11 papers evaluating the measurement properties of five instruments were included in this review. The instruments identified were the DASH questionnaire, the QuickDASH questionnaire, the NULI questionnaire, the SFA and the SAMP test. There was limited positive evidence of validity of the DASH, QuickDASH, NULI, SFA and SAMP. There was limited positive evidence of reliability of the NULI, SFA and SAMP. There was unknown evidence of responsiveness of the DASH and QuickDASH.

Conclusion: Although all measures are supported by a limited amount of low quality evidence, the DASH, QuickDASH, NULI questionnaires, and the SAMP test are promising measures, but they require further robust evaluation.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

MEASURING UPPER LIMB DISABILITY FOR PATIENTS WITH NECK PAIN: EVALUATION OF THE FEASIBILITY OF THE SINGLE ARM MILITARY PRESS (SAMP) TEST

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Background and Aims: Neck Pain (NP) is common and frequently associated with upper limb disability (ULD). Consequently, optimal management of NP may require ULD rehabilitation, and therefore include the use of ULD outcome measure (OM) in the diagnostic and therapeutic processes. The SAMP test is the only performance-based ULD OM that was designed specifically for populations with NP. Prior to undertaking further validation studies, the aim of this study was to investigate the feasibility of the SAMP test from both patients and clinicians' perspectives.

Methods : This cohort study was reported in accordance with the CONSORT statement. A total of 70 female patients with NP were randomly allocated into one of three groups. Participants in each group were SAMP tested using one of three proposed weights ($\frac{1}{2}$ kg, 1kg or $1\frac{1}{2}$ kg). The feasibility of the SAMP procedure was established using structured qualitative exit-feedback interview for patients and clinicians individually.

Results: Participants tested using $\frac{1}{2}$ kg achieved the highest mean SAMP scores but high proportion reported it as extremely light, whereas those tested using $1\frac{1}{2}$ kg achieved the lowest mean SAMP scores and high proportion reported it as very heavy. Participants tested using 1kg achieved an average mean SAMP score and high proportion reported it as neither light nor heavy. Clinicians and patients confirmed that the SAMP test was quick and very easy to complete.

Conclusion: The findings indicate that a 1kg SAMP procedure is feasible for use in female patients with NP. The measurement properties of the SAMP test should be confirmed in a patient group.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

UNRAVELLING THE PROGNOSTIC ROLE OF SOCIO-CULTURAL FACTORS IN PATIENTS WITH NON-SPECIFIC MUSCULOSKELETAL PAIN IN PRIMARY CARE PHYSIOTHERAPY; THE CULTURAL PAIN DIVERSITY (CUPID) PROSPECTIVE COHORT STUDY

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Background and Aims: Treating non-specific musculoskeletal (MSK) pain effectively is one of the biggest challenges in health care today. The available research indicates that the burden of pain is unequally distributed in society and affects people based on racial, ethnic and cultural characteristics. Research shows that the meaning of pain, the evaluation and interpretation of pain, and the consequent emotional and behavioural responses may be influenced by race, ethnicity and culture. However, to what extent disparities in pain prevalence, pain intensity and/or pain related disability exist in groups of people from different ethnic and cultural backgrounds in the European population visiting the physiotherapist remains unclear. Therefore, the aims of this prospective study are to examine the associations between socio-cultural characteristics and pain, pain-related disability and quality of life at baseline and prospectively in people with non-specific MSK-pain visiting primary care physiotherapy.

Methods : This study concerns a prospective cohort study carried out in primary care physical therapy practices. The sample will consist of adults (18-80 years) with non-specific (MSK)-pain, which is defined as low back pain, neck pain, shoulder pain and/or knee- or hip pain. Demographic, pain-related, physiological and socio-cultural data will be collected. Primary outcome measures will be pain (Numerical Pain Rating Scale), pain related disability (Pain Disability Index) and quality of life (Short Form Health Survey). Socio-cultural measures will be the predictors. Measures will be assessed via an online questionnaire at baseline (T0), and at follow-up periods at three months (T1), six months (T2) and twelve months (T3) after baseline.

Hypotheses: We expect that socio-cultural factors such as having a migration background, lower education level, poor work situation etc. are associated with higher pain intensity scores, higher scores of pain-related disability and lower quality of life in patients with non-specific MSK-pain. Further expectations are that these social-cultural factors are negative predictors for pain intensity, pain duration and pain-related disability and quality of life on long-term.

Implications: Acquiring knowledge about the role of socio-cultural factors in non-specific MSK-pain enables researchers and clinicians to deepen their insight into the

Funding bodies which supported the submitted research: Rotterdam University of Applied Sciences, Rotterdam, The Netherlands.





POSTER PRESENTATION

PERIPHERAL NERVE STIMULATION IN THE TREATMENT OF SURAL NEUROMA PAIN: A SUCCESSFUL CASE

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Background and Aims: In this clinical case we assess the outcome of a patient implanted with a wireless peripheral nerve stimulator for the treatment of neuropathic pain caused by a sural neuroma developed after Achilles tendon surgery.

Methods: We implanted a Bioness Stimrouter® device along the trajectory of the right sural nerve. The implantation occurred under direct ultrasonography and correct lead placement was confirmed by intraoperative stimulation of the sural nerve. The procedure was done under local anaesthesia and occurred uneventfully.

Results: Two weeks after implantation the patient experienced excellent pain relief and the pain scores measured with the Numeric Rate Scale (NRS) went from 8/10 to 3/10. She reported an important reduction in opioid intake and obvious improvements in mobility and sleep quality. At the 3-month follow-up the pain reduction persisted, and she had completely stopped the medical treatment with opioids.

Conclusions: Peripheral nerve stimulation has shown efficacy in treating a large variety of mononeuropathies in the past decades. However, the lack of devices specifically designed to use in the periphery has limited its use. The Bioness Stimrouter® is minimally invasive and was specifically designed for peripheral implantation. In this article we present a successful case of its use in a patient with history of neuropathic pain in the distribution of the right sural nerve caused by an iatrogenic neuroma. Further clinical series involving a large number of patients with a long-term follow-up are needed to confirm the efficacy of this device in the treatment of chronic peripheral neuropathic pain.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

INVESTIGATING BRAIN DYNAMICS UNDERLYING REDUCED HABITUATION TO PAINFUL STIMULI IN MIGRAINE USING DYNAMICAL CAUSAL MODELLING

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Background and Aims. Reduced habituation characterizes the interictal migrainous brain as it is a consistent finding in response to repetitive stimuli from several sensory modalities. In the current study, we investigated brain dynamics underlying atypical habituation to painful stimuli in interictal migraine using EEG.

Methods. We investigated modulations in effective connectivity between the sources of laser evoked potentials (LEPs) from a first to final block of trigeminal LEPs using Dynamic Causal Modelling (DCM) in a group of 23 episodic migraine patients and 20 controls. Specifically, we looked at how these connectivity modulations differ between migraine patients and controls. The secondary somatosensory area (IS2, rS2), insula (lIns, rIns), anterior cingulate cortex (ACC), contralateral primary somatosensory cortex (IS1) and a hidden source representing the thalamus, were the regions considered.

Results. DCM results showed that the control group had decreases in connection strengths in the final block compared to the first block from the hidden source to rS2, IS2 and IS1 while this was not apparent in the migraine group. Further, there was an increase in connectivity from the rIns to the hidden source for the controls while this connection decreased in migraineurs. An increase from IS2 to the hidden source and a decrease from IS2 to lIns was visible for migraineurs but not for controls. Finally, lateral connections between insular regions were more increased in migraine.

Conclusions. Under the assumption that the hidden source represents the thalamus, these results are in line with the hypothesis of atypical thalamo-cortical network dynamics in migraine.

Funding bodies which supported the submitted research: Fund for Scientific Research- Flanders.





POSTER PRESENTATION

A EUROPEAN SURVEY ABOUT NEEDS AND BELIEFS OF HEALTHCARE AND FAMILY CAREGIVERS REGARDING PAIN ASSESSMENT AND MANAGEMENT IN DOC PATIENTS

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Background and Aims: Due to the absence of communication, care for patients with disorders of consciousness (DOC) is an important clinical and ethical issue, especially for pain assessment and management. In this survey we aim to investigate the needs and beliefs of patients' relatives and caregivers regarding pain assessment and management. By allowing a better understanding of their expectations this study could improve the management of pain in this sensitive population and decrease psychological distress of health professionals, caregivers and families.

Methods: To this end we developed an online survey that will be diffused through 40 institutions in Europe involved in the management of DOC patients. The questionnaire will be divided in 2 sections: a first part to collect respondents' socio-demographic information (e.g., age, gender, country of residence, nationality, religion, current work, year of experience with DOC patients) in compliance with the GDPR regulation; and a second part collecting data to understand the respondents' knowledge and expectations on pain assessment and management of DOC patients (e.g., questions regarding pain perception in DOC patients, behavioral signs of pain, pain assessment tools or pain treatment). The study will last about 15 minutes and adapted according to the group (i.e., healthcare or family member).

Results: Chi-square tests will assess differences between the proportions of answers depending on the following variables: gender, profession, religion, and years of expertise or living with DOC patients.

Conclusions: Based on the answers, we aim to develop guidelines to improve pain management and assessments for families and caregivers of DOC patients.

Funding bodies which supported the submitted research: the University and University Hospital of Liege, the Belgian National Funds for Scientific Research (FRS-FNRS), the European Union's Horizon 2020 Framework Programme for Research and Innovation under the Specific Grant Agreement No. 785907 (Human Brain Project SGA2), the Luminous project (EU-H2020-fetopenga686764), the European Space Agency (ESA) and the Belgian Federal Science Policy Office (BELSPO) in the framework of the PRODEX Programme, the Center-TBI project (FP7-HEALTH- 602150), the Public Utility Foundation 'Université Européenne du Travail', "Fondazione Europea di Ricerca Biomedica", the Bial Foundation, the Mind Science Foundation and the European Commission, the European Union's





Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 778234.





POSTER PRESENTATION

CHRONIC PAIN IN EHLERS-DANLOS SYNDROME: A CASE CONTROL STUDY PROTOCOL TO REVEAL NEW INSIGHTS IN PAIN SYMPTOMATOLOGY AND PATHOPHYSIOLOGY

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Background and Aims: The Ehlers-Danlos syndromes (EDS) are a heterogeneous group of heritable connective tissue disorders hallmarked by generalized joint hypermobility, skin hyperextensibility and abnormal wound healing problems with formation of atrophic scars. Chronic musculoskeletal pain is a common, but poorly studied, manifestation in EDS. Treating these pain complaints is often difficult resulting in analgesic overuse, multiple orthopedic surgeries and (para)medical shopping. This study aims to objectify the presence and role of pain in EDS, and assess if pain processing pathways are affected in this population.

Methods: EDS patients (n=100; 50 classical EDS, 30 hypermobile EDS, 30 vascular EDS) will be evaluated and compared to pain-free healthy controls (n=50). Pain related symptoms and characteristics will be assessed using validated questionnaires (McGill Pain Questionnaire, Pain Detect Questionnaire, Central Sensitization Inventory). Quantitative sensory testing will include determining detection and pain thresholds to several types of stimuli to establish the presence of neuropathic and/or central sensitization pain. Spinal modulation will be assessed by determining the nociceptive flexion reflex (NFR) threshold. Pain facilitatory pathways will be examined by evaluating cognitive/affective factors using questionnaires, and temporal summation of pressure pain and the NFR. Pain inhibitory pathways will be assessed using a conditioned pain modulation paradigm. How these pain related symptoms and dysfunctions impact fatigue, activities and health status will be studied through questionnaires.

Hypotheses and implications: This clinical study may contribute to a better understanding of the role of chronic pain in EDS and the mechanisms by which it is generated and maintained, paving the way towards targeted and safer therapeutic approaches.

Funding bodies which supported the submitted research: FWO research project (3G041519).





POSTER PRESENTATION

PAIN-RELATED FEAR IS RELATED TO GLENOHUMERAL MOVEMENT VARIABILITY DURING UNPREDICTABLE REACHING TASKS

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Background and Aims: To investigate the relation between pain-related fear and movement behavior in persons with persistent shoulder pain during different reaching tasks. Shoulder pain is a common musculoskeletal complaint, hampering performance of daily activities. In other musculoskeletal pain conditions, pain-related fear is related to movement characteristics. However, this relation is unclear in persons with shoulder pain.

Methods: Data were obtained from adults with chronic shoulder pain. Inertial sensors (Xsens Technologies, NL) were used to collect three-dimensional glenohumeral and scapulothoracic kinematics during three reaching tasks (each consisting of 45 repetitive movements), which differentiated in level of movement predictability and task-inducing pain. Pain-related fear was assessed by the Tampa Scale for Kinesiophobia. Correlation statistics were used to assess relations between movement characteristics and pain-related fear.

Results: Nineteen individuals ($45.7y \pm 16.8$) were included. Mean three-dimensional glenohumeral and scapulothoracic movements were not related to pain-related fear. Higher glenohumeral cycle-to-cycle movement variability was related to more pain-related fear, exclusively in the unpredictable reaching task.

Conclusion(s): Our results indicate that pain-related fear only relates to cycle-to-cycle movement variability at the painful joint. This motor behavior of increased movement variability in relation to higher levels of pain-related fear is furthermore dependent on the requested task specifications, i.e. relations are only apparent in an unpredictable reaching task.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

THE DEVELOPMENT AND MEASUREMENT PROPERTIES OF THE DUTCH VERSION OF THE FEAR-AVOIDANCE COMPONENT SCALE

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Background and Aims: Pain-related fear avoidance (FA), involving pain catastrophizing, hypervigilance and avoidant behavior, is common in persons with low back pain (LBP). The currently applied patient-reported instruments measuring these constructs are not sufficient, as they lack construct validity, item specificity and completeness. Therefore, a new scale, the fear-avoidance component scale (FACS; score:0-100), has been developed, within the most current FA framework. This study aimed to investigate the measurement properties of the Dutch FACS.

Methods: the Dutch FACS was generated through forward-backward translation, and completed by 65 persons with subacute/chronic LBP (41±17yrs). Internal consistency was assessed by the Cronbach's alpha coefficient and construct validity by examining the FACS' correlation with the Numerical Rating Scale (NRS) pain, Oswestry Disability Index (ODI), Tampa Scale for Kinesiophobia (TSK), Pain Catastrophizing Scale (PCS), Hospital anxiety and depression scale (HADS-A/HADS-D), and Injustice Experience Questionnaire (IEQ-Dutch). Test-retest reliability was assessed in 10 persons with LBP (intraclass correlation coefficients (ICC), standard error of measurement (SEM), minimal detectable change (MDC 95%)).

Results: Cronbach's alpha was 0.93. Higher FACS scores correlated significantly with higher scores on NRS-pain ($r = .78; p < .0001$), ODI ($r = .71; p < .0001$), TSK and PCS ($r = .64$ and $.75$; both $p < .0001$), HADS-A and HADS-D ($r = .57$ and $r = .49$; both $p < .0001$) and IEQ-Dutch ($r = .77; p < 0.0001$). The ICC, SEM and MDC were respectively 0.82, 5.8 and 16.2.

Conclusion(s): The Dutch version of the FACS showed excellent internal consistency, good construct validity and high test-retest reliability in individuals with LBP. This scale can be used to assess FA in a Dutch-speaking LBP-population.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

THE INFLUENCE OF PHYSIOLOGICAL FACTORS ON THE NOCICEPTIVE FLEXION REFLEX IN HEALTHY ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and Aims: The nociceptive flexion reflex (NFR) is a spinally-mediated withdrawal response and is used as an electrophysiological marker of spinal nociception. Previous reports in healthy adults have shown that the NFR suffers from a large interpersonal variability. One probable explanation for this observation is variability on the personal level. Largely unexplored are, however, the individual factors that are associated with this variability. Therefore, the present review aimed at outlining the existing evidence on the impact of various (non-)modifiable physiological factors on the NFR in healthy adults.

Methods: A systematic review and meta-analysis was performed and reported following the PRISMA-guidelines. Five electronic databases were searched to identify relevant articles. Retrieved articles were screened on eligibility using predefined inclusion criteria. Risk of bias was investigated according to the modified Newcastle-Ottawa Scale. Levels of evidence and strength of conclusion were assigned following the guidelines of the Dutch Institute for Healthcare Improvement.

Results: Fifty-one articles were included. The effect of cardiac cycle, circadian rhythm, ethnicity, sleep, overweight, blood glucose, physical activity, and breath-holding on the NFR was described. Ethnicity and a genetic risk for hypertension were identified as factors mediating temporal summation of the NFR. The present review also suggests that descending pain inhibitory processes to dampen spinal nociception are resistant to the influence of several other physiological factors.

Conclusion(s): These findings provide a rationale for considering the physiological factors identified in this review when evaluating spinal nociceptive processing. Moreover, it may be of great interest for clinicians to address modifiable factors in order to reduce spinal hyperexcitability.

Funding bodies which supported the submitted research: Jessica Van Oosterwijck is a post-doctoral research fellow funded by the Research Foundation – Flanders (FWO) [12L5619N and 12L5616N]. Sophie Van Oosterwijck is a PhD research fellow funded by the Research Foundation – Flanders (FWO) [11A8620N].





POSTER PRESENTATION

TRANSCUTANEOUS-VNS AND NOCICEPTION: ELECTROPHYSIOLOGIC INSIGHT FROM THE INSULA

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Background and Aims: Transcutaneous VNS (tVNS) is a non-invasive neurostimulator targeting the auricular branch of the vagus nerve. Despite anatomical, experimental and clinical evidence of its potential analgesic effect, precise knowledge on how tVNS affects pain perception is lacking. In a previous experiment, we used scalp EEG to record the effects of tVNS on laser-evoked event related potentials (ERPs). However, tVNS did not alter the amplitude nor latency of these ERPs. We hypothesized that this lack of effect could reflect the fact that tVNS affects deeper cerebral structures such as the insular lobe, which is not well recorded through scalp EEG. This work will therefore investigate how tVNS modulates nociception at insular level.

Methods: This study will include 12 epileptic patients, undergoing invasive EEG as part of their presurgical evaluation. We will perform a two-day randomized protocol comparing active tvns (cymba conchae) with sham tVNS (earlobe), at equivalent parameters of stimulation (25Hz, 250µs, duty cycle: 30s ON/ 30s OFF). Nociceptive laser heat stimuli (60°C, 120ms) and innocuous vibrotactile stimulation (300Hz, 100ms) will be delivered on the hand dorsum contralateral to the insular electrode. Stimuli-evoked event related potentials will be recorded from the insular contacts during baseline and ongoing auricular stimulation.

Results (preliminary n=1): In comparison to baseline recordings, tVNS and sham stimulation increased the amplitude of laser-evoked ERPs during the duty cycle OFF phases. Interestingly, both stimulations also altered vibrotactile-evoked ERPs.

Conclusion: By characterizing how tVNS affects laser-evoked insular ERPs, we hope to better understand how tVNS modulates pain perception.

Funding bodies which supported the submitted research: FRIA-B1.





POSTER PRESENTATION

INVESTIGATING THE MULTISENSORY INFLUENCE OF VISION ON NOCICEPTION-INDUCED CORTICO-SPINAL EXCITABILITY

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Background and Aims: Efficiently reacting to painful events requires an optimally integrated multisensory representation of the body and its surrounding space, coordinating the processing and integration of somatic and extra-somatic stimuli occurring near the body. While such representations would allow optimizing manipulation of innocuous objects, they would also optimize defensive actions against threatening stimuli.

Methods: Multisensory interactions between nociceptive and near visual stimuli have recently been evidenced. Here we investigated the influence of such nociceptive-visual interaction on the motor excitability of the hand on which nociceptive stimuli are applied in healthy volunteers, by testing whether nociception-induced changes of cortico-spinal excitability (n-CSE) can be differently modulated by visual stimuli presented in the space surrounding the hand vs. visual stimuli presented farther away. CO₂-laser nociceptive stimuli were applied on the right hand, followed by 80 ms by a visual stimulus rapidly approaching a location either near or far from the stimulated hand. During each trial, single-pulse transcranial magnetic stimulation over the left M1 hand representation was applied at one out of 3 possible time points (at baseline, 150 or 200 ms after the nociceptive stimulus), eliciting motor-evoked potentials (MEPs) in the right first dorsal interosseous muscle. Conditions comprising only nociceptive or visual stimuli (near or far) were also presented.

Results: Preliminary results show a general reduction of MEPs 200 ms after the potential occurrence of the nociceptive stimulus. However, this reduction seemed not differently modulated by near vs. far visual stimuli, suggesting that our experimental setting did not allow to highlight specific visual-nociceptive interaction effects on CSE.

Funding bodies which supported the submitted research: Funded by the Fund for Scientific Research of the French-speaking Community of Belgium (F.R.S.-FNRS).





POSTER PRESENTATION

THE PREDICTIVE VALUE OF PSYCHOSOCIAL FACTORS AND NOCICEPTIVE STIMULI PROCESSING ON PAIN AND DISABILITY IN CHRONIC (SUB)-ACUTE LOW BACK PAIN: A 3-MONTH FOLLOW-UP STUDY.

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Background and Aims: The clinical presentation and pain experience of patients with (sub)-acute low back pain (LBP) can strongly vary in clinical practice. However, there is a growing evidence that psychosocial factors are predictors for disability in chronic pain conditions including LPB, illustrating the importance of early stage recognition to the prognosis, there is still a lack of studies examining psychosocial factors and nociceptive stimuli processing in (sub)-acute LBP. So, the purpose of this prospective study is to determine the relation between psychosocial factors and nociceptive stimuli processing in (sub)-acute LBP seen at baseline and the prognosis of disability and pain intensity after 3 months follow up.

Methods: Eighty-four patients with sub-acute LBP were subjected to a baseline evaluation (i.e. conditioned pain modulation (CPM) and a battery of questionnaires. Sixty-three patients completed the follow-up evaluation (disability and pain intensity). Correlation and multiple linear regression analysis were conducted to determine the clinical importance of baseline factors at three months follow-up.

Results: Correlations with disability were found for kinesiophobia ($r=-0,33$, $p<0,05$) and catastrophizing ($r=-0,31$, $p<0,05$). Only one correlation was found for pain with CPM change score ($r=0,22$, $p<0,05$). Kinesiophobia (9,8%) and catastrophizing (8,1%) were the most important predictive values for the difference in disability after 3 months. CPM was only responsible for a 5,7% variance of the difference in pain intensity (VAS).

Conclusion: Results demonstrate that kinesiophobia, catastrophizing and nociceptive stimuli processing had a prognostic value on pain and disability in patients with (sub)-acute LBP 3 months later.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

BURST-LIKE CONDITIONING ELECTRICAL STIMULATION OF CUTANEOUS NOCICEPTORS IS MORE EFFICACIOUS THAN CONTINUOUS STIMULATION IN INDUCING HETEROSYNAPTIC FACILITATION OF MECHANICAL NOCICEPTIVE INPUT IN HUMANS

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Background and Aims: The aim of the present study was to compare the efficacy of burst-like conditioning electrical stimulation versus continuous stimulation of cutaneous nociceptors for inducing increased pinprick sensitivity in the surrounding unstimulated skin (a phenomenon also referred to as secondary hyperalgesia).

Methods: In a first experiment (N=30) we compared the increase in mechanical pinprick sensitivity induced by 50 Hz burst-like stimulation (N=15) versus 5 Hz continuous stimulation (N=15), while maintaining the total number of stimuli and the total duration of stimulation. In a second experiment (N=40), to control for the different frequency of stimulation, we compared 5 Hz continuous stimulation (N=20) versus 5 Hz burst-like stimulation (N=20), while keeping the total number of stimuli as well as the frequency of stimulation the same.

Results: In the first experiment, we found a significantly greater increase in mechanical pinprick sensitivity in the surrounding unstimulated skin after 50 Hz burst-like stimulation compared to 5 Hz continuous stimulation ($p=.013$, Cohen's $d=.970$). In the second experiment, we found a significantly greater increase in pinprick sensitivity after 5 Hz burst-like stimulation compared to 5 Hz continuous stimulation ($p=.009$, Cohen's $d=.868$).

Conclusion: Our data shows that burst-like conditioning electrical stimulation is more efficacious than continuous stimulation for inducing secondary hyperalgesia.

Funding bodies which supported the submitted research: EvdB is supported by the Fonds de Recherche Clinique (FRC) provided by UCLouvain, Belgium. AM is supported by the ERC "Starting Grant" (PROBING PAIN 336130).





POSTER PRESENTATION

EFFECT OF BRAIN TRAINING THROUGH VISUAL MIRROR FEEDBACK, ACTION OBSERVATION, AND MOTOR IMAGERY ON OROFACIAL SENSORIMOTOR VARIABLES: A SINGLE-BLIND RANDOMIZED CONTROLLED TRIAL

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Background and Aims: The main objective was to evaluate the effects of action observation (AO), visual mirror feedback (VMF), and motor imagery (MI), combined with an orofacial exercise program, on sensorimotor variables in asymptomatic participants.

Methods: We designed a randomized, single-blind, controlled trial that included 52 asymptomatic participants who were randomly assigned to 4 groups, 13 to each of the VMF, MI, and AO groups and 13 to the control group (CG), which only performed the exercise program. The primary outcomes were pain pressure thresholds (PPTs) and tongue muscle endurance. The secondary outcomes were maximum mouth opening (MMO), tongue extensibility, and the ability to generate mental motor images. Each group underwent a 3-session intervention using their respective exercise. Measurements were performed before starting the intervention and after each of the 3 sessions (pre, mid1, mid2, and post).

Results: ANOVA revealed significant changes in PPTs in the masseter muscle region in the MI and AO groups in the pre-post and mid1-post changes. ANOVA revealed significant differences in tongue muscle endurance in the anterior direction only in the AO group in the pre-mid2 and pre-post changes.

Conclusion: AO and MI, in conjunction with exercise, could induce changes in PPTs for the masseter muscle. In addition, only AO produced changes in tongue muscle endurance. More research is needed to determine the role of mental practice in the orofacial region and transferring this exercise to the rehabilitation setting.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

THE (COST-) EFFECTIVENESS OF PRIMARY CARE FOR PATIENTS WITH CHRONIC MUSCULOSKELETAL PAIN FOLLOWING NETWORK PAIN REHABILITATION LIMBURG: PROTOCOL OF A PRAGMATIC TRIAL

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Background and Aims: The rehabilitation care for patients with chronic musculoskeletal pain (CMP) is not optimal organized. The Network Pain Rehabilitation Limburg 2.0 (NPRL2.0) is developed aiming to provide integrated care with a biopsychosocial approach for patients with CMP. NPRL2.0 strives to improve the Quadruple Aim outcomes. The aim of this study is to assess the effectiveness, regarding pain related disability of patients, and cost-effectiveness, regarding healthcare costs of primary care, following NPRL2.0 compared to regular organization of care.

Methods: A pragmatic study with a stepped-wedge based design (group 1) and a prospective cohort study (group 2) with local networks in primary care will be performed. It is expected that six and two local networks and 184 and 105 patients will participate in group 1 and 2 respectively. The healthcare professionals within local networks will recruit patients. Inclusion: age ≥ 18 years, having CMP, willing to improve functioning despite pain, and adequate Dutch literacy. Exclusion: pregnancy, a suspicion of a treatable medical- or psychiatric disease. Patients will complete questionnaires at baseline, 3 months, 6 months and 9 months consisting of the Short Form Health Survey, EQ-5D-5L, iMTA Medical Consumption Questionnaire, and iMTA Productivity Cost Questionnaire as primary outcomes for effectiveness and economic consequences from a societal perspective. Outcomes on questionnaires will be compared using linear mixed model analysis and costs will be compared using bootstraps.

Conclusion: NPRL2.0 is a multidimensional, complex intervention, executed in daily practice, which highlights the need for a pragmatic study design without randomization of patients.

Funding bodies which supported the submitted research: Healthcare insurances CZ, VGZ and Zilveren Kruis.





POSTER PRESENTATION

DOES PEAK ALPHA FREQUENCY PREDICT SECONDARY HYPERALGESIA?

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Background and Aims: Previous studies have demonstrated a link between some features of the frequency spectrum of the resting-state electroencephalogram (EEG) and pain sensitivity.

Peak Alpha Frequency (PAF) is the frequency among the 7-13Hz band displaying the greatest power over sensorimotor areas. It has been shown in healthy volunteers that the PAF during a pain-free state before the induction of a painful state could predict the subsequent sensitivity to pain of those participants. More specifically, a shift of pain-free PAF towards lower frequencies has been correlated with subsequent higher pain ratings. The aim of this project is to assess the relationship between pain-free PAF and the development of secondary hyperalgesia induced after high frequency electrical stimulation of the skin (HFS).

Methods: Three periods of 3 minutes eyes open and eyes closed resting-state EEG will be recorded in 32 subjects before HFS and 30 minutes after HFS. In addition, using questionnaires, the participants will be asked about their sleep, pain and menstrual cycle.

Conclusion: Based on previous studies, we expect to observe a negative correlation between PAF and pain ratings.

Funding bodies which supported the submitted research: This project has received funding from the Innovative Medicines Initiative 2 Joint Undertaking under grant agreement No [777500]. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation program and EFPIA. www.imi.europa.eu; www.imi-paincare.eu. The statements and opinions presented here reflect the author's view and neither IMI nor the European Union, EFPIA, or any Associated Partners are responsible for any use that may be made of the information contained therein.





POSTER PRESENTATION

TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION REDUCES MOVEMENT-EVOKED PAIN IN PEOPLE WITH CHRONIC LOW BACK PAIN: A RANDOMISED CROSSOVER STUDY.

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Background and Aims: Chronic low back pain is a highly prevalent and complex condition. Physical activity is known to be an important key player in the treatment of pain conditions. However, pain response to physical activity can vary across pain populations. Lately, researchers suggested beneficial effects for Transcutaneous Electrical Pain Stimulation (TENS) in reducing pain during movement. Therefore, we aimed to investigate the effects TENS on movement-evoked pain (MEP).

Methods: 23 patients with chronic (>3 months) low back pain (11 males, 12 females and mean [SD] age, 44.3 [12.6] years) were included in this crossover study. MEP was assessed under 2 conditions in a counterbalanced, randomised, crossover order: first without TENS-treatment and second, during TENS treatment. MEP was assessed using two different movement tasks: the Back Performance Scale (BPS) and a 5-minute walk test (5MWT). Secondary outcome measures included pain at rest and physical performance.

Results: Pairwise comparisons showed significantly improved pain scores during TENS-treatment (BPS: $p < 0.001$, $r = 0.59$ and 5MWT: $p = 0.001$, $r = 0.51$; medium effect sizes and exceeding minimally clinical important differences). Pain at rest significantly improved as well ($p = 0.011$, $r = 0.37$, small effect size and clinically important pain relief). No significant differences could be observed for physical performance ($p > 0.05$).

Conclusion: TENS significantly improved MEP, pain at rest but not physical performance in people with chronic low back pain. Future research should focus on investigating the application of TENS during exercise programs in clinical practice.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

THE PRESENCE OF CENTRAL SENSITIZATION IN CHRONIC IDIOPATHIC NECK PAIN: A STUDY PROTOCOL

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Background and Aims: Chronic idiopathic neck pain (CINP) is a type of neck pain that arises without a specific cause and lasts minimally 3 months, with a prevalence of 30% to 50% for 12-months lasting CINP. Due to the current lack of knowledge concerning the underlying factors responsible for the maintenance of this chronic pain conditions, there is no consensus on specific therapy approaches for CINP. The chronicity and severeness of the disorder has led to paradigm shifts in the reasoning about chronic pain from seeing it as a symptom towards as a disease. Neuroimaging has provided evidence that chronic pain is a multidimensional process affecting sensory and emotional processing based on an altered state of the central nervous system in the form of central sensitization (CS). Changes in both structural and functional brain activity and connectivity over time contribute to an augmentation of pain perception, by an enhanced pain facilitation and defective inhibition of nociceptive signals. However, to date it remains debated whether CS is present as a pathophysiological feature in CINP.

Methods: 30 CINP patients will be compared to 30 healthy controls. Quantitative sensory testing, based on pain pressure thresholds and contact heat evoked potentials will be evaluated and compared between both groups. Electro-encephalography will be recorded during 5 minutes of resting state brain activity, as well as during the evaluations of temporal summation and conditioned pain modulation.

Conclusion: The current project aims at determining whether CS is a pathophysiological feature of CINP and at optimizing therapy options.

Funding bodies which supported the submitted research: Fonds wetenschappelijk onderzoek.





POSTER PRESENTATION

PHARMACOLOGICAL CHARACTERIZATION OF THE SPINAL α_2 -ADRENOCEPTORS SUBTYPES WHICH MODULATES THE NOCICEPTION

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Background and Aims: The intrathecal administration of clonidine induces analgesia through the activation of spinal α_2 -adrenoceptors. These receptors are classified into three subtypes, α_2A -, α_2B - and α_2C -adrenoceptors, without establishing the subtype or subtypes that could be mediating this antinociception. Through a behavioral and electrophysiological approach, the present study elucidated the pharmacological profile of the α_2 -adrenoceptor subtypes involved in clonidine-induced antinociception.

Methods: Male Wistar rats divided into two experimental groups were used. In the first experimental group, the antinociceptive effect of clonidine (0.1, 1, and 10 nmol/10 μ l, intrathecal) and/or pretreatment with α_2 -antagonists was evaluated in a behavioral nociception model (1% formalin): (i) BRL 44408 (α_2A - antagonist), (ii) imiloxan (α_2B - antagonist) or (iii) JP-1302 (α_2C - antagonist). In the second experimental group, unitary extracellular responses of wide dynamic range (WDR) neurons evoked by the stimulation of their peripheral receptive field (20 stimuli, 0.2 Hz, 1-msec duration, 0.1-3 mA) before and after spinal administration of clonidine (1-10 nmol/10 μ L) and pretreatment with antagonist BRL 44408, or JP-1302.

Results: The behavioral and neuronal nociception was inhibited by clonidine (0.1-10 nmol), this antinociception was only blocked by antagonist BRL 44408. In the case of behavioral nociception, intrathecal administration of JP-1302 inhibited nociception; this effect was blocked in animals pretreated with bicuculline (GABA_A receptor antagonist).

Conclusion: This study suggests that clonidine exerts its antinociceptive effect through the activation of α_2A -adrenoceptors. On the other hand, it is shown that blocking α_2C -adrenoceptors exerts a behavioral antinociceptive effect, probably mediated by the participation of GABAergic mechanisms.

Funding bodies which supported the submitted research: Consejo Nacional de Ciencia y Tecnología (CONACyT).





POSTER PRESENTATION

VIRTUAL REALITY DISTRACTION INDUCES ANALGESIA IN PATIENTS WITH CHRONIC LOW BACK PAIN: A RANDOMIZED CONTROLLED TRIAL

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Background and Aims: Attentional distraction from pain has been shown to be largely ineffective for obtaining an analgesic effect in patients with chronic pain when compared to a control condition. It is hypothesized that this may be due to the non-engaging types of distraction that have been used so far. Moreover, it is suggested that the analgesic effects of distraction may be attenuated by pain-related cognitions and emotions, as they may increase the attention to pain.

Methods: In this randomized controlled trial, patients with chronic nonspecific low back pain in the intervention group (n= 42) performed a single exercise session with nonimmersive VR games, while those in the control group (n= 42) performed the same exercises without VR games. We investigated whether VR distraction had an analgesic effect during and immediately after the exercises, and whether it reduced the time spent thinking of pain during the exercises. We further assessed whether pain-related fear, pain catastrophizing and baseline pain intensity moderated the effects of VR distraction.

Results: VR distraction had an analgesic effect during (Cohen's $d= 1.29$) and immediately after (Cohen's $d= 0.85$) the exercises, and it also reduced the time spent thinking of pain (Cohen's $d= 1.31$). Pain-related fear, pain catastrophizing and baseline pain intensity did not moderate the effects of VR distraction.

Conclusion: Large effect sizes of VR distraction induced analgesia were observed. This suggests that nonimmersive VR games can be used when it is deemed important to reduce the pain during exercises in patients with chronic nonspecific low back pain.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

THE COGNITIVE MODULATION OF MECHANICAL HYPERSENSITIVITY: DOES AUTONOMIC AROUSAL PLAY A ROLE?

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Background and Aims: Low-frequency stimulation (LFS) of the human skin induces hypersensitivity to mechanical pinprick stimuli. The execution of a high cognitive load working memory task seems to decrease the development of mechanical hypersensitivity after LFS. However, the underlying mechanisms of this cognitive modulation are still unclear. Besides replicating these findings, the aim of the present study is to examine whether autonomic arousal plays a role in the cognitive modulation of mechanical hypersensitivity.

Methods: We will use a between-subjects design including 84 participants balanced by gender. During LFS, participants will either perform a control task with a low cognitive load or a 2-back task with a high cognitive load. Mechanical pinprick sensitivity will be tested before and 20 minutes after LFS. In addition, we will assess tonic and phasic arousal by measuring skin conductance. Brain activity will be recorded using electroencephalography.

Hypotheses: We expect mechanical hypersensitivity to develop after the control task, but not after the 2-back task. More importantly, we expect a higher phasic arousal during the 2-back task than during the control task. Furthermore, we expect the control group to show a stronger EEG response during LFS than the experimental group.

Possible implications: These findings would suggest that autonomic arousal plays a role in the cognitive modulation of mechanical hypersensitivity, which would give us more insight in the underlying mechanisms of cognitive interventions

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

THE EFFECTIVENESS OF HANDS-OFF THERAPY IN THE MANAGEMENT OF PATIENTS WITH HEADACHE: A SYSTEMATIC REVIEW

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Background and Aims: Headache disorder is a major public health problem with impact on both individual sufferer and the society. It is considered the most prevalent neurological symptom experienced by almost everyone and it entails widespread suffering for patients and large cost for society including; increased utilization of healthcare resources, work absence and reduced work effectiveness. It is therefore imperative to investigate the effectiveness of therapies like hands-off that may reduce visits and dependence on health care providers and may also reduce job absenteeism among headache sufferers. The aim is to search the effectiveness of hands-off therapies in headache management.

Methods: A systematic search of studies reporting various hands-off interventions used for headache management was conducted in two online databases; PubMed and Web of Science. The outcomes of interest were; pain intensity, quality of life, disability and sleep quality. Only studies on adult population were included. Reviewers independently assessed the quality of each trial and reported the outcomes. The Cochrane collaboration's tool for assessing risk of bias in randomized trials was used for assessing the quality of the included studies.

Results: The search provided 1786 abstracts of which 33 randomized controlled trials (RCTs) comprising of 3346 participants were included. 80% of the participants were females and 21 out of the 33 studies comprised of migraine population. The evidence synthesis revealed varying types of hands-off interventions for headache with good to fair level of evidence for their effectiveness.

Conclusion: Fair to good evidence supports the effectiveness of hands-off therapies in the management of headache.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

PROTOCOL FOR A RANDOMIZED CONTROLLED TRIAL: HOW DOES EXERCISE THERAPY FOR KNEE OSTEOARTHRITIS PAIN WORK?

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Background and Aims: Previous research demonstrated that exercise-induced anti-inflammation and endogenous analgesia are most promising pathways to reduce knee-osteoarthritis pain (KOAP). This study aims to investigate (1) the mediating role of inflammation and/or endogenous analgesia in the effect of exercise therapy (ET) (muscle strengthening training (MST); behavioral graded activity (BGA)) on KOAP and (2) whether KOAP changes are associated with acute treatment effects.

Methods: A randomized-controlled trial will be conducted in UZ Brussel and AZ St-Dimpna Geel. KOAP patients (n=90) will be randomly assigned to the MST, BGA, or control group for a three-month intervention and twelve-month follow-up. MST involves leg muscle-strengthening exercises. BGA includes behavioral therapy combined with ET to gradually increase patients' activity level. Control patients maintain their lifestyles.

The primary outcome is pain, evaluated by the Knee injury and Osteoarthritis Outcome Score. Secondary outcomes are pain subtypes, functionality in daily living, adherence/compliance, and medical consumption. Mediation analysis will be performed to evaluate the potential mediating role of (acute)inflammation and endogenous analgesia. The former will be tested by a blood-based biomarkerpanel for chronic-low-graded-inflammatory profile, the latter will be investigated by pain physiological tests. Assessments will be performed at baseline, at week 2-3 and week 10-11 (pre- and post-treatment for the acute effects), and 48h, 13 and 52 weeks after the last intervention.

Conclusion: This will be the first trial investigating (acute)inflammation and endogenous analgesia as potential mediators in the effect of ET on KOAP. By unravelling underlying mechanisms of ET in KOAP, treatment optimization can occur by tailoring ET towards acute effects.

Funding bodies which supported the submitted research: This research is supported by Research Foundation Flanders (FWO) (application number: G040919N) and Vrije Universiteit Brussel (VUB).





POSTER PRESENTATION

EXPLORING PAIN, BODY COMPOSITION AND PHYSICAL ACTIVITY IN CHILDREN WITH CANCER: A CASE-CONTROL STUDY

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4. Research Foundation – Flanders (FWO)

Background and Aims: Pain is very prominent during childhood cancer treatment as children with cancer undergo numerous invasive medical procedures. These procedures are necessary in the treatment, but they often provoke significant pain and distress for the child. In line with this, it seems interesting to investigate whether children with cancer show decreased widespread pain thresholds compared to healthy children. Indeed, widespread hyperalgesia is characteristic of central nervous system hypersensitivity. Besides, children with cancer often have decreased physical activity (PA) levels and altered body composition compared to healthy peers. Given the bidirectional associations between pain and PA demonstrated in adolescents and the associations between pain and body composition in adults, it seems interesting to look at such associations in children with cancer, as well in order to increase our understanding about pain in childhood cancer and its relationship with lifestyle factors.

Methods: Participants consist of 30 cancer patients and 30 healthy controls (8-12yo). Pressure pain thresholds (measured with a digital pressure algometer), body composition (determined by TANITA MC-780SMA) and energy-balance related behavior (based on a selection of questions of the ENERGY Cross-Sectional Survey), will be compared between childhood cancer patients and healthy peers.

Hypotheses & implications: We hypothesize that children with cancer have decreased pressure pain thresholds and are less physically active compared to healthy peers. Furthermore, we hypothesize that certain body composition parameters, such as lower muscle index, are associated with more pain in children with cancer. Findings of this study might have important implications for physical rehabilitation goals in childhood cancer patients.

Funding bodies which supported the submitted research: Grant support for Emma Rheel was provided by a Chair funded by the Berekuyil Academy/European College for Decongestive Lymphatic Therapy, the Netherlands, and awarded to the Vrije Universiteit Brussel, Belgium.





POSTER PRESENTATION

USING HYPNOSIS AND VIRTUAL REALITY DURING PRE AND POSTOPERATIVE CARDIOVASCULAR SURGERY

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Background and Aims: Anxiety, pain and fatigue are important factors influencing the good recovery of patients after a surgery. Nowadays, non-pharmacological techniques such as hypnosis and virtual reality are used in addition to pharmacological treatment to reduce these symptoms. The aim of the project is to better understand the impact of VR, hypnosis and the combination of hypnosis and VR (VRH) on anxiety and pain on patients who are undergoing a cardiac surgery.

Methods: Patients were randomly assigned to four conditions (control, hypnosis, VR and VRH). Each patient received 20 minutes of one of the technique the day before and the day after the surgery. We evaluated levels of pain, anxiety, fatigue and relaxation after each session. Evolution of these parameters over time was assessed by using a generalised linear mixed model (GLMM).

Results: 100 patients (66.38 ± 11.48 years;; 24 women) were included. Results showed that anxiety decreased only in preoperative period ($p < 0.0001$), independently of the technique used.. Relaxation increased in all groups in preoperative ($p = 0.0018$) and postoperative period ($p = 0.03$). There were no significant results for pain and fatigue ($p > 0.05$).

Conclusion: Anxiety and relaxation are modified in all groups, including control group. We cannot affirm that one technique is better than another. Nevertheless, this study helped to expand the knowledge regarding the application of virtual reality, hypnosis and virtual reality/hypnosis in the specific context of cardiac and intensive care department. More studies are needed to compare and evaluate the costs-effectiveness of these techniques in others contexts.

Funding bodies which supported the submitted research: the University and University Hospital of Liège, the Benoit Foundation (Belgium), the Non-Fria Grant (Belgium) and the Belgian Cancer Fundation (2017-064).





POSTER PRESENTATION

THE ASSOCIATION BETWEEN CENTRAL SENSITIZATION AND SLEEP IN PATIENTS WITH CHRONIC SPINAL PAIN AND COMORBID SLEEP PROBLEMS: SECONDARY ANALYSIS OF A RANDOMIZED CONTROLLED MULTICENTER TRIAL

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Background and Aims: Chronic spinal pain (CSP) has an impact on different aspects of the quality of life, such as the sleep quality. Sleep disturbance is a highly prevalent and disabling comorbidity in CSP patients. The mechanisms that appear in CSP patients with insomnia seem to be related to those of central sensitization. Hence, the association between central sensitization and sleep in patients with CSP and comorbid sleep problems is still poorly understood. The aim is To investigate the association between central sensitization and sleep in patients with chronic spinal pain and comorbid sleep problems. Thereby differences on different sleep-related outcomes between low and high self-reported symptoms of central sensitization will be examined. Patients: 72 persons with chronic spinal pain and comorbid sleep problems with high or low self-reported symptoms of central sensitization.

Methods: Central sensitization was measured with the Central Sensitization Inventory (CSI). The sleep-related outcomes were measured by different questionnaires such as the Insomnia Severity Index (ISI), Pittsburgh Sleep Quality Index (PSQI), Brief Pain Inventory (BPI), Hospital Anxiety and Depressions scale (HADS), Epworth Sleepiness Scale (ESS), Brugmann Fatigue Scale (BFS), Short Form Health Survey-36 items (SF-36) and Dysfunctional beliefs and attitudes about sleep scale (DFAS).

Results: The results of statistical analysis will be available in February 2020.

Conclusion: This study will lead to a better understanding of the association between central sensitization and sleep in CSP patients with comorbid sleep problems. Thereby differences between





high and low CSI-severity groups on different sleep-related outcomes will also enhance the current scientific knowledge.

Funding bodies which supported the submitted research: This study is funded by Fonds Wetenschappelijk Onderzoek – Toegepast Biomedisch Onderzoek (FWO-TBM, grant no. T001117N). The funder had no role in the design and conduct of the study; the collection, management, analysis, and interpretation of the data. Anneleen Malfliet is funded by the Research Foundation Flanders (FWO), Belgium. Eveline Van Looveren and Thomas Bilteryx are both funded by the Applied Biomedical Research Program (TBM) of the Agency for Innovation by Science and Technology (IWT) and the Research Foundation Flanders (FWO).





POSTER PRESENTATION

LOCALIZED NEUROPATHIC PAIN: PATCH OR PILL? A MULTICENTRE, RANDOMIZED, OPEN-LABEL, COMPARATIVE STUDY

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Background and Aims: Neuropathic pain (NP), caused by lesion/disease of the somatosensory nervous system, has a considerable negative impact on patient's quality of life (QoL) and association with a high economic burden. Localized neuropathic pain (LNP), a subtype of NP affecting a clearly demarcated area, includes several etiologies (postherpetic neuralgia/diabetic polyneuropathy/peripheral nerve injury). Current first-line treatment for LNP with oral systemic drugs (anticonvulsants/antidepressants/opioids) has limited efficacy, long treatment period, risk for drug-related adverse events and interactions with concomitant medication and remains a challenging clinical problem. Topical treatment with a lidocaine 5% or capsaicin 8% medicated plaster may be an excellent alternative. Topical application offers site-specific delivery, low total systemic dose and so reduced risk of adverse events and drug interactions.

Methods: The PELICAN study is a multicentre, randomized (1:1:1), open-label, comparative trial. 591 adult patients suffering from LNP (between 1-24 months), will be randomised to receive oral pregabalin, lidocaine 5% patch or capsaicin 8% patch for a treatment period of 24 weeks.

Results: Primary objective is significant improvement in health-related QoL in the topical treatment group. Secondary objectives are effectiveness of pain relief, aspects of QoL (sleep, mood), drug tolerance and functional status. Data will be collected through an online platform using standardized Web-based questionnaires. Final results are expected early 2021.

Conclusion: Few data are to date regarding oral vs. topical treatment for LNP. Topical analgesics should be considered as first-line treatment for LNP, because its benefit/risk ratios are far better compared to systemic agents.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

POSTERIOR SPINAL FUSION SURGERY FOR ADOLESCENT IDIOPATHIC SCOLIOSIS: IMPLEMENTATION OF A MULTIDISCIPLINARY BIOPSYCHOSOCIAL PERIOPERATIVE CARE MODEL

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Background and Aims: Posterior Spinal fusion (PSF) for adolescent idiopathic scoliosis (AIS) is one of the most invasive orthopedic surgical procedures during childhood characterized by persistent postsurgical pain (PPSP). Although large comprehensive data is lacking, its incidence of PPSP is estimated 22% at 6 months and 15% at 1-5 years postoperatively. There is no evidence that some analgesic policy is superior.

The study objective was to evaluate the implementation of an ERP containing early recovery goals, assessment of PPSP 3 months postoperatively, biopsychosocial oriented preemptive treatment, a Web-based platform containing psychological screening questionnaires and extensive telemonitoring postdischarge.

Methods: A prospective cohort study is initiated in paediatric patients undergoing PSF in 2019. The ERP, commenced preoperatively, includes patient education, eHealth-based psychological screening, multimodal preemptive analgesia and early rehabilitation. Follow-up, 12 weeks postdischarge, is using a Web-based diary (pain, sleep, daily activity), while their rehabilitation progress is monitored via Bluetooth-connected telemonitoring devices.

Results: Preliminary results are expected early 2020. Primary outcome measurement is postoperative pain reduction. Secondary outcomes are opioid-related side-effects and mobilization onset. An elaborate study design will allow identification of psychological confounders and early recognition of PPSP.

Conclusion: Early allocating patients to appropriate level of care may improve short and long-term outcome variables. Internet-based technologies and feasible, objective monitoring tools can help clinicians to screen patients for risk factors and initiate early treatment when indicated. Future research should focus on improving risk stratification, including psychological assessment and evaluation of the effect of perioperative care pathways in children undergoing major surgery.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

THE PREDICTIVE VALUE OF FEAR AVOIDANCE BELIEFS FOR SURGICAL OUTCOME FOLLOWING LUMBAR DEGENERATIVE DISEASE: PROTOCOL OF A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and Aims: Lumbar degenerative diseases encompass conditions such as disc herniation, spondylolisthesis and spinal stenosis, and are often associated with low back pain, low extremity pain and weakness. Although surgery for these lumbar degenerative diseases is mostly anatomically successful, some patients still continue to experience pain, disability or a diminished quality of life following the surgery. As fear avoidance beliefs are established as key factors in the development of chronic pain, they might also be important factors in the development of persistent pain, disability and diminished quality of life following surgery. This systematic review aims to examine whether fear avoidance beliefs predict surgical outcome in patients following spinal surgery for lumbar degenerative disease.

Methods: Outcome measures include pain intensity, functional status and quality of life at ≥ 3 months following the surgery. The prognostic factors of interest are the fear avoidance beliefs related to the fear avoidance model. A search will be conducted in Pubmed/Medline, EMBASE, Physiotherapy Evidence Database, PsycINFO, CINAHL and the Cochrane library. The quality of eligible studies will be assessed using the Quality In Prognosis Studies tool, resulting in an overall rating of low, moderate or high risk of bias. A modified version of the Grading of Recommendations Assessment, Development, and Evaluation will be used to synthesize the level of evidence of the results. When at least 2 studies provide data on the same prognostic factor in relation to the same surgical outcome, a meta-analysis using collected individual participant data will be carried out.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

THE EFFECTIVENESS OF PAIN NEUROSCIENCE EDUCATION ON POSTOPERATIVE FUNCTIONING IN BREAST CANCER PATIENTS: A RANDOMIZED CONTROLLED TRIAL

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5. University Hospitals Leuven, Department of Surgical Oncology

Background and Aims: Over the past decades, awareness on the importance of educational interventions in cancer pain management has increased. However, education is often restricted to biomedical pain management instructions. A more modern educational approach, also known as pain neuroscience education (PNE), explains pain from a biopsychosocial perspective. We hypothesise that this more comprehensive educational approach in the early treatment phase of breast cancer will lead to more beneficial effects for cancer pain management. Therefore, the aim of the present study is to investigate the effectiveness of this PNE intervention, in addition to best evidence physical therapy modalities for treatment and prevention of pain, physical, emotional and work-related functioning after breast cancer surgery, compared with a traditional biomedical educational intervention.

Methods: A double-blinded randomised controlled trial has been started in November 2017 at the University Hospitals of Leuven. Immediately after breast cancer surgery, all participants (n=184) receive a 12-week intensive standard physical therapy programme. They receive three additional refresher sessions at 6, 8 and 12 months postsurgery. In addition, participants receive three educational sessions during the first-month postsurgery and three 'booster sessions' at 6, 8 and 12 months postsurgery. In the intervention group, the content of the education sessions is based on the modern PNE approach. Whereas in the control group, the education is based on the traditional biomedical approach. The primary outcome parameter is pain-related disability 1 year after surgery. Secondary outcomes related to other dimensions of pain, physical, emotional and work-related functioning at 1-week, 4, 6, 8, 12 and 18 months postsurgery.

Funding bodies which supported the submitted research: The study is funded by Research Foundations – Flanders (FWO) (T005117N).





POSTER PRESENTATION

UNRAVELLING SHOULDER- AND KNEE PAIN AND RELATED DISABILITY: A CROSS-SECTIONAL STUDY EXAMINING THE CONTRIBUTION OF PATHOLOGICAL, PAIN PHYSIOLOGICAL AND PSYCHOLOGICAL FACTORS

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Background and Aims: Patients suffering from chronic shoulder- or knee pain are frequently seen in musculoskeletal rehabilitation. Knowing to what extent various distinct factors contribute to these pains and related disability is fundamental for optimal care. Previous studies suggest that pathological, pain physiological and psychosocial factors may contribute to pain intensity and disability, although in none of these studies are they taken together. The aim of the present study is to determine how pathoanatomical, pain physiological and psychological factors contribute to pain intensity and disability in patients with chronic shoulder- or knee pain.

Methods: This study concerns a cross-sectional study, involving patients visiting the orthopaedic department of the Erasmus Medical Centre (N = 130) in Rotterdam, The Netherlands. The sample will consist of adults (18-80) who: 1) have complaints of either shoulder- or knee pain for at least three months with a minimal mean pain intensity (last 24 hours) of 3/10 on a Numerical Pain Rating Scale (NPRS) during arm/knee movements. Dependent variables are pain (NPRS) and functional limitations (Shoulder Pain and Disability Index for shoulder patients and the Knee Injury and Osteoarthritis Outcome Score for knee patients). Predictor variables are pathoanatomical changes (Kellgren-Lawrence classification with knee patients or Samilson-Prieto classification with shoulder patients), pain physiological measurements (Pressure Pain Threshold, Temporal Summation, Conditioned Pain Modulation and Central Sensitization Inventory) and pain catastrophizing (Pain Catastrophizing Scale). Multiple regression analyses will be conducted in order to answer research questions.

Funding bodies which supported the submitted research: Rotterdam University of Applied Sciences, Rotterdam, The Netherlands.





POSTER PRESENTATION

COMPARISON OF COOLED VERSUS CONVENTIONAL RADIOFREQUENCY TREATMENT OF THE GENICULAR NERVES FOR CHRONIC KNEE PAIN: A MULTICENTRE RANDOMISED CONTROLLED NON-INFERIORITY PILOT TRIAL (COCOGEN TRIAL)

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2. MUMC+, Anesthesiology - Chronic pain
3. Rijnstate, Anesthesiology - Chronic pain
4. ZOL, Orthopedics

Background and Aims: Knee osteoarthritis is a degenerative process often resulting in pain. When conservative treatment fails, a total knee arthroplasty (TKA) can be performed, although it is not suitable for all patients. Also, persistent post-surgical pain (PPSP) is frequent. For these specific groups a radiofrequent treatment (RF) of the genicular nerves might be an alternative treatment. A conventional and cooled RF are two different modalities which have never been directly compared.

The primary goal is to provide an estimate of treatment effects, inclusion rate, and comparability of patients between hospitals to assess the feasibility of conducting a future trial to assess whether conventional RF of the genicular nerves is not inferior to the more expensive cooled RF on pain relief. A secondary goal is to estimate the cost-effectiveness of conventional RF compared to cooled.

Methods: Study design: prospective, multicentre, double blind, randomised controlled, non-inferiority pilot study. Study population: Adult patients with chronic, moderate to severe knee pain due to osteoarthritis or with PPSP after TKA. Intervention: One group is treated with a conventional RF, the other with cooled RF. Main study endpoints: The primary study outcome parameter is the proportion of patients with a pain intensity reduction of at least 50% at 3 months post intervention. Secondary parameters include physical functioning, health-related quality of life, emotional outcome, patient satisfaction, side effects, duration effect, medication use, and cost effectiveness. Inclusion rates will be monitored as well.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

EFFECTIVENESS OF A RADIOFREQUENCY TREATMENT OF THE GENICULAR NERVES IN CHRONIC KNEE PAIN

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Background and Aims: Management of chronic knee pain remains challenging. Chronic knee pain can be the consequence of osteoarthritis or of persistent post-surgical knee pain (PPSP). Recently, the genicular nerves became targets of interest for a radiofrequency (RF) treatment. This procedure is minimal invasive making it a treatment with potential to fulfill the unmet needs of these patients warranting further research. The aim of this retrospective analysis was to evaluate the effectiveness of US guided RF treatment of the genicular nerves in patients with chronic knee pain at 6 weeks post-treatment.

Methods: Study design: We retrospectively reviewed data of patients who qualified for a RF treatment of the genicular nerves between September 2017 and October 2019. A treatment was defined successful when observing a GPE of at least 50%. Exclusion criteria were chronic widespread pain (CWP) and a negative prior diagnostic block.

Results: In total, 41 patients of 56 were included (8 negative diagnostic block, 6 CWP, 1 lost to follow up) of which 13 (32%) had treatment success. Eight patients had partial effect (20%) and 20 patients had no effect (49%). 85,7% of the patients had PPSP. In the group of responders the mean NRS reduction was 3,5 points. The only complication reported was cutaneous hypoesthesia after treatment in four cases.

Conclusion: Our retrospective case series shows US guided RF treatment of the genicular nerves is a possible alternative treatment option for chronic knee pain. Especially for PPSP this is a promising technique, since there aren't a lot of alternative treatment strategies.

Funding bodies which supported the submitted research: None.





POSTER PRESENTATION

Feasibility of an ultrasound-guided approach to radiofrequency ablation of the superolateral, superomedial and inferomedial genicular nerves: a cadaveric study

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Introduction: Genicular nerve radiofrequency (RF) denervation appears to be a promising treatment for knee pain in patients with degenerative osteoarthritis of the knee, when candidates are not suitable for arthroplasty. This study aimed to assess the accuracy and reliability of ultrasound-guided placement of RF cannulas in cadavers for genicular nerve treatment, by measuring the needle-to-nerve proximity.

Methods: Five soft-fix human cadavers were included in this study, totaling 10 knees (mean age 93.8 years). Using the ultrasound-guided technique, which we have described previously, RF cannulas were directed toward the superolateral genicular nerve (SLGN), the superomedial genicular nerve (SMGN) and the inferomedial genicular nerve (IMGN). Indocyanine green (ICG) dye (0.1 mL) was infiltrated. An anatomical dissection was performed and the distance from the center of the ICG mark to the genicular nerve concerned was measured.

Results: The mean distances from the center of the ICG mark to the SLGN, SMGN and IMGN were 2.33 mm (range 0.00–6.05 mm), 3.44 mm (range 0.00–10.59 mm) and 1.32 mm (range 0.00–2.99 mm), respectively. There was no statistical difference in distances from the center of the ICG mark to the targeted nerve between the different nerves ($p=0.18$).

Conclusion: The results of this study demonstrate that ultrasound-guided treatment of the genicular nerves is feasible. However, for RF ablations, there are some limitations, which mostly can be overcome by using appropriate RF ablation settings.

Funding bodies which supported the submitted research: None.

