Annual Report

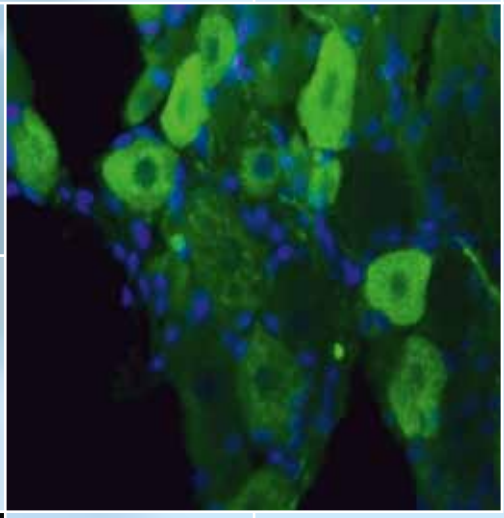
Danish Headache Centre

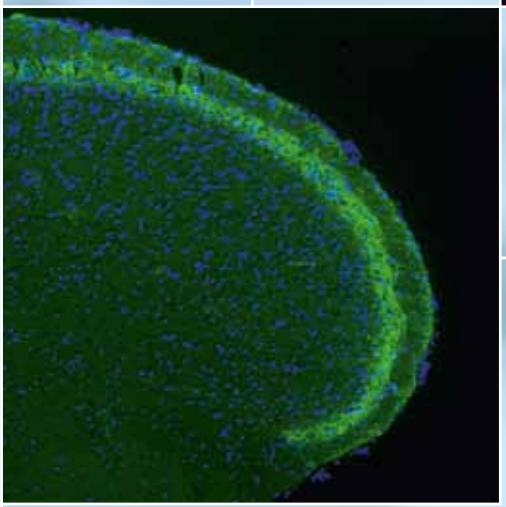
2009

Department of Neurology

Glostrup Hospital, University of Copenhagen

www.danishheadachecenter.dk





Danish
Headache Center

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Preface

This annual report provides an overview of the clinical and research activities that took place at The Danish Headache Centre and the affiliated Glostrup Research Park in 2009.

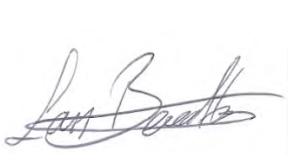
The clinical activities have been maintained at a high level both in terms of productivity and quality thanks to our highly committed staff members and the feedback from the patients continues to be very positive.

Several new treatment programmes have been initiated or carried forward in 2009 in order to continuously improve the quality of the clinical work. A new in-patient treatment programme for patients with long-standing, difficult to treat headaches with specific focus on a multidisciplinary treatment approach has been implemented. Other innovative treatment programmes regarding posttraumatic headache, idiopathic intracranial hypertension, headache due to increased contraction of jaw muscles and medication-overuse headache have been carried forward.

The research at The Danish Headache Centre and the affiliated basic research at Glostrup Research Park continues to be very active with a high number of publications and a large impact factor. In 2009 three PhD-theses were successfully defended by our young researchers. Congratulations.

Additional information can be found at our homepage: www.danishheadachecenter.dk

Glostrup, April 2010



Lars Bendtsen

1. Research

1.1 Organization

Danish Headache Centre has a vigorous research group including 7 senior researchers, 2 post docs, 17 Ph.D. students mostly MD's and medical students. The organization of research is shown in Figure 4.

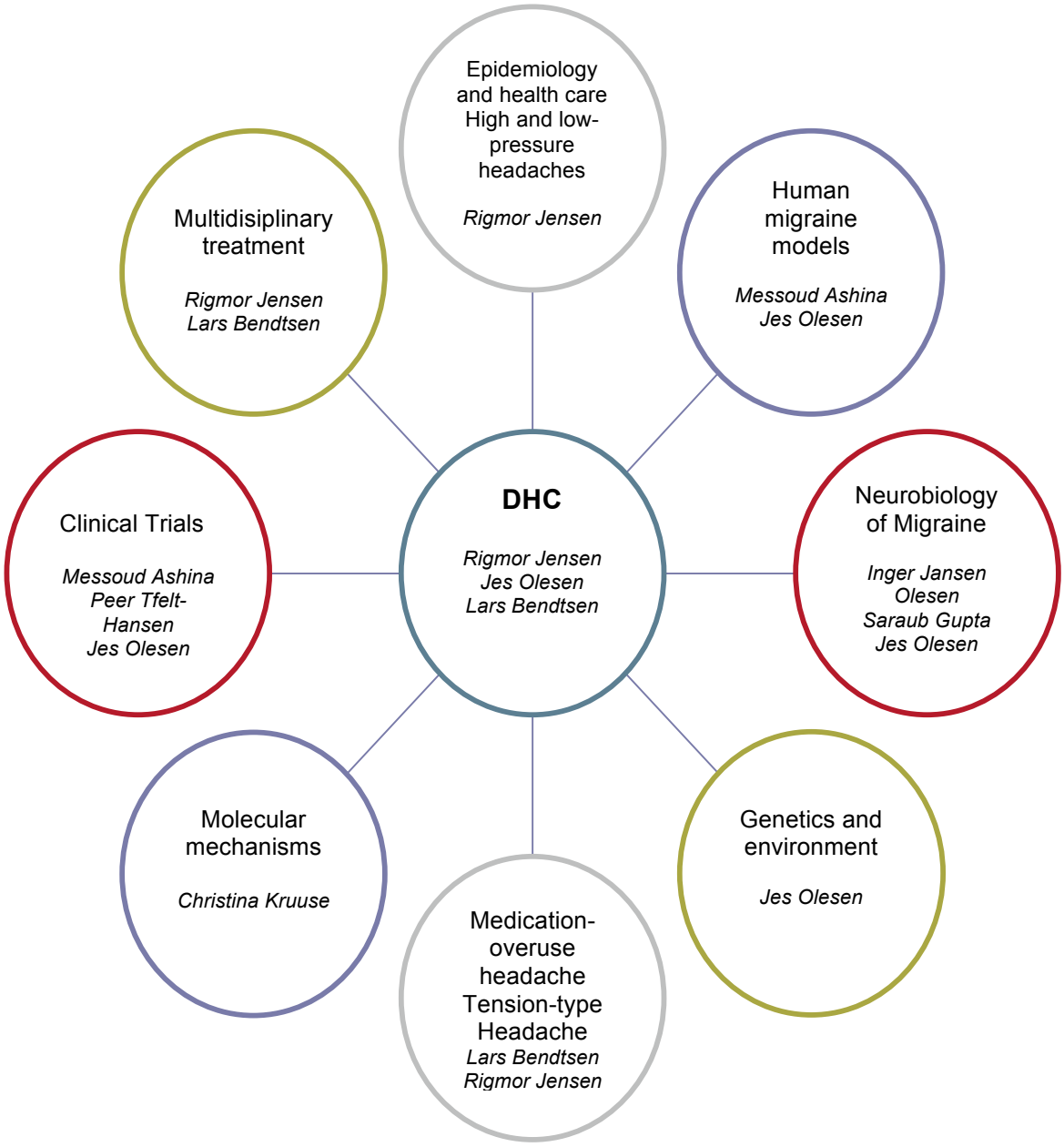


Figure 1. Organization of Research.

1.2 Research Staff

Senior scientists:

Jes Olesen
Rigmor Jensen
Peer Tfelt-Hansen
Inger Jansen Olesen
Messoud Ashina
Saurabh Gupta
Lars Bendtsen

Associate senior researchers:

Lise Lykke Thomsen
Christina Kruuse
Malene Kirchmann

Post docs.

Lars Schack Kruuse
Kenneth Beri Plough

Technologists:

Hanne Andresen
Lene Elkjær
Winnie Grønning

Administrative assistants:

Kirsten Hjelm
Susie Andersen
Karin Aagård

Ph.D.students:

Henrik Winther Schytz
Sohail Asghar
Kim Lindelof
Jakob Møller Hansen
Troels Wienecke
Anne Werner Hauge
Maren Skau
Helle Wulf
Michael Baun
Han Le
Signe Bruun Munksgaard
Dorthe Phillip
Maja Myren
Dipak Vasantrao Amrutkar
Deepak Kumar Bhatt
Roshni Ramachandran
Julie Carøe Kristensen

1.3 Research Areas

Human migraine models

Members: Messoud Ashina, Sohail Asghar, Jakob Møller Hansen, Henrik Schytz, Troels Wienecke, Dorte Phillip, Jes Olesen & Maria Antonova.

Background

Fast tracking of new drugs for migraine have faced the major challenge of poorly-predictive preclinical models. Indeed, novel, migraine-specific preventive drugs have not been developed in decades. Furthermore, the acute therapy armamentarium remains suboptimal, with no new chemical entities since the triptans. On the other hand, human experimental studies are surfacing as a powerful tool in targeted migraine therapy. To this end, human studies have identified three novel targets: inhibitors of cortical spreading depression, antagonists of calcitonin gene-related receptors, and chemicals that prevent the production of nitric oxide. Two of these novel mechanisms are in phase 3 clinical development and one is in phase 2. These encouraging observations, which are based on 20 years of research in human models, have led us to develop a research paradigm for the identification of novel migraine drug targets, which combines human provocation studies and preclinical models.

Current projects

- Role of prostaglandins in migraine pathophysiology: Effect of EP4 receptor antagonist in PGE2 model of headache
- Acute pain evoked by VIP and PACAP in cutaneous model of pain
- Changes in diameter of extra- and intracranial vessels during CGRP induced headache before and after sumatriptan administration: MRA study
- Activation of trigeminal pain pathways during different sequences of CGRP induced migraine attack: fMRI study
- Changes in diameter of extra- and intracranial vessels during CGRP induced migraine attack: MRA study

Collaboration

Henrik Larsson and Adam Espe Hansen (Department of Clinical Physiology); Vibeke Andre Larsen (Department of Radiology); David Borsook and Lino Becerra, PAIN Group, Mclean Hospital, Harvard University Boston USA; David A Boas, Optical Imaging Core & Lab at Martinos Centre Department of Radiology, Boston USA; Professor Lars Arendt Nielsen, Centre for Sensory-Motor Interactions, Department of Health Science and Technology, Aalborg University, Denmark; Professor van der Geest, Leiden University Medical Centre, Holland.

Tension-type headache

Members: Lars Bendtsen, Kim Lindelof, Rigmor Jensen.

Background

Increased understanding of the relative importance of peripheral factors (mainly muscular) and central factors (mainly central pain processing) in the pathophysiology of tension-type headache are crucial for the development of more effective treatment options for this disorder. Experimental models studying muscular factors, e.g. muscle pain sensitivity, and central factors, e.g. degree of wind-up, and the interaction between these factors are needed to explore the cause/effect relationship between the various peripheral and central abnormalities reported in tension-type headache. Previous studies from our group have, e.g., demonstrated abnormal tenderness and pain perception indicating central sensitization.

Current projects

Investigations of muscular pain sensitivity, processing, modulation of peripheral nociceptive input in the central nervous system and the role of neck pain in tension-type headache.

Collaboration

Professor Jens Elrich, Centre for Sensory-Motor Interactions, Department of Health Science and Technology, Aalborg University, Denmark. Professor Lars Arendt Nielsen, Centre for Sensory-Motor Interactions, Department of Health Science and Technology, Aalborg University, Denmark. Professor Tim Steiner, Division of Neuroscience and Mental Health, Imperial College London, London W6 8RP, UK.

Epidemiology

Members: Rigmor Jensen.

Background

Epidemiology is the study of the distribution and determinants of health-related states or events in specified populations. The Glostrup County population study from 1989 was the first prevalence study of specific headache entities in a representative general population, based on a structured interview and examination by a physician. This study demonstrated the huge impact headache has on individuals and society. A follow-up study showed an increase in frequency and health care utilisation and thereby indicated a higher impact of headache in 2001 that in 1989. Risk factors for migraine were young age, female gender, familial disposition, no vocational education, high work load and frequent tension-type headache. For tension-type headache risk factors were young age, female gender, poor

self-rated health, inability to relax after work, and sleeping fewer hours per night. In general migraine and tension-type headache had a favourable prognosis with increasing age and only a minority of subjects had increased headache frequency. Prognostic factors were identified.

Current projects

Supplementary data analysis of the large follow-up study is ongoing with specific focus on chronification, clinical headache characteristics and socioeconomic impact. A large clinical study of patients treated at the Danish Headache Centre has already been conducted with main focus on medication overuse headache. It has been demonstrated that detoxification have a very positive outcome, especially in migraineurs and that these patients becomes reactive to migraine prophylactics again. Several new projects focusing on specific treatment results and neurobiological mechanisms underlying medication overuse headache are ongoing. Data from the epidemiological studies are related to newer population studies and predictors for chronification are searched.

Genetics and environment

Members: Anne Hauge, Han Le, Jes Olesen.

Background

Family studies and twin studies show that the risk of migraine is 50% inheritance and 50% environment. The identification of genes involved in migraine may give clues to underlying pathophysiological mechanisms. It is equally important to identify the environmental factors, which so far are largely unknown.

Current projects

One aim of our studies is to identify the genes involved in migraine with aura, familial hemiplegic migraine, and migraine without aura. To date we have collected blood from more than 1400 migraine patients and the molecular genetics analyses have been initiated. In twin studies we try to identify the most important environmental risk factors for migraine.

Intracellular transduction mechanisms in migraine

Members: Christina Kruuse, Carina Jørgensen, Lars Schack Kruse,
Julie Carøe Kristensen.

Background

Studies in humans help to explore possible migraine and headache provoking factors, in

order to understand migraine pathophysiology. It is known that pain signalling in humans involve second messenger signalling through both types of second messengers; cyclic adenosine monophosphate (cAMP) and cyclic guanosine monophosphate (cGMP). However, the function and interaction of these signalling pathways and the cellular location in either neuronal or vascular cells is not fully understood. The aim is thus to localize and investigate function of tissue and cells assumed relevant in initiation of the pain process in order to investigate potential treatment targets. In collaboration with Department of Clinical Biochemistry Glostrup, Department of Neuroscience and Pharmacology and Functional Imaging Unit and Dept Clinical Physiology and Nuclear medicine we describe the presence of some of the intracellular signalling molecules, involved in the pain process, the effects of modulating the signalling cascade in pain and regulation of cerebral artery diameter in cell and tissue based systems as well as in humans.

Current projects

We are currently looking at the distribution and function of phosphodiseterases (PDE), which are responsible for controlling the cAMP and cGMP levels in the cells. In particular how they may relate to the pain sensing structures in the brain and play a part in the induction and possible maintenance of headache and migraine.

Studies of the pharmacology and molecular mechanisms of migraine triggering substances

Members: Inger Jansen Olesen, Saurabh Gupta, Kenneth Beri Ploug, Helle Wulf, Michael Baun, Maja Myren, Dipak Vasantrao Amrutkar, Deepak Kumar Bhatt, Roshni Ramachandran, Jes Olesen.

Background

Using the human migraine models mentioned above, we receive knowledge about the headache provoking properties of endogenous signalling substances in man. We believe that a drug or substance that can block the effect of a headache/migraine provoking substance will be effective in the treatment of migraine and thus be a novel target for future development of medicine for migraine. Moving the studies of migraine triggering substances from man to animal we have the possibility to characterize the receptors or ion-channels for these substances in the migraine relevant tissues; cerebral arteries, dural arteries, dura mater, trigeminal ganglion and trigeminal nucleus caudalis. The characterization is performed by combining several different molecular and in vitro and in vivo functional studies.

- RT-PCR and in situ hybridization for investigating the presence of mRNA for the different subtypes of receptors and/or ion channels.

- Western blotting and immunohistochemistry to investigate the presence and localization of protein for the different subtypes of the receptors and/or ion channels.
- In vitro pharmacological characterization of the vascular receptors activated by the migraine triggering substances.
- In vitro studies of the calcitonin gene-related peptide (CGRP) (a sensory peptide with a role in migraine pathophysiology) releasing properties of the migraine triggering substances in dura mater, trigeminal ganglion and trigeminal nucleus caudalis.
- In vivo pharmacological characterization of the receptors activated in dural and pial arteries after intra carotid infusion of the migraine provoking substances.

During infusion of a headache/migraine triggering substance the migraine sufferers experience more pain than non-migraineurs. This immediate headache is 4-5 hrs after the infusion followed by a delayed headache sometimes fulfilling the criteria for migraine. We have recently developed an animal model, where the migraine triggering substances are infused to un-anaesthetized rats and the molecular changes in the migraine relevant tissues mentioned above are investigated. By these studies we expect to unravel the cascade of molecular changes taking place in the time period between infusion of a migraine triggering substance and the development of a migraine attack.

Current projects

At present we characterize the two ion channels; ATP sensitive potassium (K(ATP)) channels and large conductance calcium activated potassium (BK(Ca)) channel in migraine relevant tissues. They are interesting because of the episodic nature of migraine attacks which suggests that ion channels are involved in its pathophysiology. Potassium channels have an important role in the regulation of vascular tone and an opener of the K(ATP) channel has in clinical trials been found to induce headache. Furthermore, the receptors for vasoactive peptides and prostanoids such as vasoactive intestinal peptide (VIP) and pituitaty adenylyl cyclase activating peptide (PACAP), CGRP, prostaglandin E2 and prostacyclin are of interest.

The studies will give us an understanding of which subtype compositions of ion channels and receptors that are present in theses tissues. In addition, they will give us information to further understand the pathophysiology of migraine and to define new targets for the pharmacological treatment of migraine.

Collaboration

Professor Lars Edvinsson (Department of Experimental Clinical Research, Glostrup Hospital), Lektor Anders Hay-Schmidt (Panum Institute, Copenhagen University), Professor Dan Klærke (Faculty of Life Sciences, Copenhagen University), Lektor Majid Sheykhzade (Faculty of Pharmaceutical Sciences, Copenhagen University), Professor Karl Messlinger (Institute of Physiology and Experimental Pathophysiology, University of Erlangen-Nürnberg, D-91054 Erlangen, Germany), Professor Frank Porreca (Department

of Pharmacology, College of Medicine, University of Arizona, Tucson, Arizona, USA), Professor Sue Duckles and Professor Diana Krause, Department of Pharmacology, University of California Irvine, Irvine, California, USA).

Idiopathic intracranial hypertension

Members: Rigmor Jensen, Maren Skau.

Background

Idiopathic intracranial hypertension (IIH) is an intriguing, clinical condition of increased intracranial pressure without pathological, laboratory or radiological evidence of intracranial pathology in young, obese individuals. The clinical symptoms are severe headache, pulsatile tinnitus, transitory visual obscurations and diplopia. Demographic studies report a rapidly increasing incidence of IIH in obese young females and with the global epidemic increase of obesity a significant increase in the number of IIH patients in Denmark can be predicted. Severe obesity is closely related to a number of neuroendocrinological changes which has still not been evaluated in IIH.

Untreated IIH may lead to severe visual loss and blindness resulting from damage to the optic nerve. The mechanism whereby IIH leads to optic nerve dysfunction is poorly understood but it seems to be closely linked to oedema of the optic nerve head and the associated elevation of hydrostatic pressure inside the optic nerve.

The multidisciplinary study of IIH comprising neurobiological and ophthalmological aspects is a unique study of still unsolved aspects in IIH. Read more about IIH on www.danishheadachecenter.com.

Current projects

One cross-sectional study of ophthalmological and neurobiological aspects in Idiopathic intracranial hypertension.

One longitudinal study of ophthalmological and neurobiological aspects in Idiopathic intracranial hypertension, with specific focus on treatment and functional outcome.

Collaboration

Dan Milea, Department of Ophthalmology, Glostrup Hospital, Denmark

Jens Peter Gøtze and Jens Rehfeld, Department of Clinical Biochemistry, Danish National Hospital, Copenhagen, Denmark.

Medication-overuse headache

Members: Signe Bruun Munksgaard, Rigmor Jensen, Lars Bendtsen.

Background

Medication-overuse headache (MOH) is a daily or almost-daily type of headache that usually results from the chronification of primary forms, such as migraine or tension-type headache, as a consequence of the progressive increase in the intake of symptomatic drugs. MOH affects a percentage of 1.4-3% of the general population. Limited amount of data exists on the burden of MOH, even in developed Countries, but there is general agreement that the disease represents one of the most disabling disorders, which markedly deteriorates the quality of life of patients, exposing them to the risks of side-effects and co-morbid conditions.

Our knowledge on the mechanisms leading to MOH are limited, and there are virtually no data on how these severely patients are treated optimally. Thus, there is an urgent need for studies investigating the pathophysiology and treatment possibilities of MOH.

Current projects

A prospective study comparing two different treatment options for MOH (abrupt drug withdrawal and a 2 month drug free period compared with restricted intake of analgesics combined with prophylactic headache treatment).

A prospective study investigating pain modulation (peripheral and central pain sensitivity) before and after drug withdrawal.

An EU-founded multi-centre study (COMO-ESTAS) investigating the benefit of electronic headache diaries during detoxification of MOH.

Collaboration

C. Tassorelli, Fondazione Istituto Neurologico Casimiro Mondino, Italy. M. Lainez, Fundación de la Comunidad Valenciana para la Investigación Biomédica del Hospital Clínico Universitario De Valencia, Spain. Z. Katsarava, Universitaetsklinikum Essen, Germany. R. Fadic, Pontificia Universidad Catolica de Chile, Santiago, Chile. A. Stoppini, Fundacion para la Lucha contra las Enfermedades Neurologicas de la Infancia, Buenos Aires, Argentina. Lars Thorbjørn, Klinisk Biokemisk afdeling, Glostrup Hospital.

Clinical trials

Members: Messoud Ashina, Jes Olesen and Peer Tfelt-Hansen

Background

The Centre participates in number of clinical trials designed to test new therapies, or new ways of using known treatments to improve the treatment of headache disorders.

Current trials

- A multicenter, double-blind, placebo-controlled, parallel group multiple attacks study to compare the efficacy and safety of oral MK-0974 with placebo for the acute treatment of migraine with and without aura. Included 72 patients
- Study NXN-188-202. An investigator initiated, double-blind, placebo-controlled, cross-over study to compare the efficacy and safety of oral NXN-188 with placebo for the acute treatment of migraine with aura. Included 34 patients

1.4 Sponsors

Major sponsors:

Lundbeck Foundation as part of the Lundbeck Foundation Centre for Neuro-vascular Signalling
Candice Foundation
Copenhagen County Foundation
Faculty of health, University of Copenhagen
Danish Research Council
European Commission

Sponsors:

Danish Headache Society
Cool Sorption Foundation
The Danish Horton Patient Association
Danish Headache Foundation
Savværksejer Jeppe Juhl og hustru Ovita Juhl's mindelegat
Aase og Ejnar Danielsens Foundation
Augustinus Foundation
Foundation of Lægevidenskabens Fremme
Familien Hede Nielsens Foundation
The Foundation for Neurological Research

2. Collaborations

Departments within Glostrup Hospital

- Department of Neurosurgery
- Department of Ophthalmology
- Department of Clinical Experimental Research
- Department of Clinical Physiology
- Department of Clinical Biochemistry

- Department of Paediatrics
- Department of Radiology
- Department of Gynaecology
- Department of Anaesthesiology
- Department of Oral and Maxillo-Facial Surgery
- Department of Clinical Neurophysiology
- Functional Imaging Unit, Dept Clinical Physiology and Nuclear medicine
- Stroke Unit, Department of Neurology

External collaborators

Clinical research

- Centre for Health and Preventive Medicine, Copenhagen County, Denmark
- Danish twin registry, University of Odense, Denmark
- Department of Neurology, Hillerød Hospital, Denmark
- Professor John-Anker Zwart, Department of Neurology, Ullevaal University Hospital, University of Oslo, Oslo, Norway
- Professor Knut Hagen, Department of Neuroscience, Faculty of medicine, Norwegian University of Science and Technology, Trondheim, Norway
- The Headache Clinic, Kiel University, Germany
- Mondino Institute of Neurology Foundation, Pavia, Italy
- Department of Physical Therapy, Department of Health Sciences, University of Lund, Sweden
- Department of Neurology, Semmelweis University, Budapest, Hungary
- Centre for Neuroimaging, Harvard University, Boston, USA
- Centre for Sensory-Motor Interaction, University of Ålborg, DK

Basic Pain Mechanisms

- Professor Jens Elrich, Centre for Sensory-Motor Interactions, Department of Health Science and Technology, Aalborg University, Denmark
- Department of Pharmacology, University of Washington, Seattle, USA
- Department of Medical Physiology, Faculty of Life Sciences, Copenhagen University, Denmark
- Institute of Pharmacology, Faculty of Pharmaceutical Sciences, Copenhagen University, Denmark
- Institute of Experimental Research, University of Lund, Sweden
- Professor Karl Messlinger, Institute of Physiology and Experimental Pathophysiology, University of Erlangen-Nürnberg, D-91054 Erlangen, Germany
- Institute of Anatomy, Panum Institute, University of Copenhagen, Denmark

Genetics and environment

- DeCode, Reykjavik, Iceland
- Danish twin registry

Headache Epidemiology

- Professor Michael Bjørn Russell, University of Oslo, Akershus Hospital, Norway
- Professor Lars-Jacob Stovner, Kompetencecenter for epidemiology, University of Trondheim, Norway

Headache diagnosis

- Professor Guiseppe Nappi, Institute Mondino, University of Pavia, Italy (EU-project)

Idiopathic Intracranial Hypertension

- Professor Dan Milea, Dr Sci Birgit Sander and Consultant Marianne Wegener, Department of Opthalmology, Glostrup Hospital
- Copenhagen CSF-study group, Department of neurosurgery, Glostrup and Rigshospitalet
- Ass Professor Jens Peter Gøtze and Professor Jens Rehfeld, Department of Clinical Biochemistry, Rigshospitalet

Medication-overuse headache

- Dr. C. Tassorelli, Fondazione Istituto Neurologico Casimiro Mondino, Italy
- Dr. M. Lainez, Fundación de la Comunidad Valenciana para la Investigación Biomédica del Hospital Clínico Universitario De Valencia, Spain
- Dr. Z. Katsarava, Universitaetsklinikum Essen, Germany
- Dr. R. Fadic, Pontificia Universidad Catolica de Chile, Santiago, Chile
- Dr. A. Stoppini, Fundacion para la Lucha contra las Enfermedades Neurologicas de la Infancia, Buenos Aires, Argentina
- Dr Csaba Ertsey, Department of Neurology, Semmelweis University, Budapest, Hungary

Guest lectures and visitors

Professor Rami Burstein, Harvard University, USA.

Professor Frank Porreca, University of Arizona, Tuscon, USA.

Professor Arne May, Germany.

Professor Tim Steiner, University of Trondheim and London

Ass professor Cristina Tassorelli, Instituto Mondino, University of Pavia, Italy

As well as numerous Danish colleagues.

3. Teaching activities

Headache disorders. Clinical course for neurologists, general practitioners and younger doctors. Glostrup Hospital, June 6th, 2009.
Medical students, Faculty of Health Sciences, University of Copenhagen.
Neurology trainees, Faculty of Health Sciences, University of Copenhagen.
Trainees from General Practise, an essential part of their educational programme.
PhD students, Faculty of Health Sciences, University of Copenhagen.
In addition, numerous teaching activities at international and national congresses.

4. Future Research Areas

In 2010 the scientific focus shall be directed towards

- Neurovascular signalling in the LUCENS centre
- Experimental human models of migraine with implementation of new imaging techniques
- Basic mechanisms of migraine in animal models
- Pain processing in tension-type headache
- Medication-overuse headache
- Idiopathic intracranial hypertension
- Posttraumatic Headache
- Clinical research in The Headache Centre
- Diagnostic procedures in Headache (EU-project)
- Monitoring of Medication Overuse Headache and development of a decision support system in **E**urope and Latin America (EU-project)

5. Publications in 2009

PhD Theses

1. Lindelof K. Antinociceptive mechanisms in chronic tension-type headache. University of Copenhagen. Faculty of Health 2009: 1-49.
2. Møller-Hansen J. Familial hemiplegic migraine-an experimental genetic headache model. Københavns Universitet. University of Copenhagen. Faculty of Health 2009: 1-127.
3. Wienecke T. Possible role of prostanoids in migraine and other headaches evaluated in an experimental human model. University of Copenhagen. Faculty of Health 2009:1-47.

In peer-reviewed scientific journals

1. Allena M, Katsarava Z, Nappi G; COMOESTAS Consortium. From drug-induced headache to medication overuse headache. A short epidemiological review, with a focus on Latin American countries. J Headache Pain. 2009 Apr;10(2):71-6.
2. Bendtsen L. Drug and non-drug treatment in tension-type headache. Therapeutic Advances in Neurological Disorders 2009;2(3):155-161.
3. Bendtsen L, Jensen R. Migraine and other headaches: Tension-type headache. Neurologic Clinics, 2009;27:525-535.
4. Bendtsen L, Bigal ME, Cerbo R, Diener HC, Holroyd K, Lampl C, Mitsikostas DD, Steiner TJ, Tfelt-Hansen P. Guidelines for controlled trials of drugs in tension-type headache: second edition. Cephalalgia 2009; Epub ahead of print.
5. Buchgreitz, L.; Egsgaard, L.; Jensen, R.; Arendt-Nielsen, L.; Bendtsen, L. Abnormal brain processing of pain in migraine without aura: a high-density EEG brain mapping study. Cephalalgia 2009 Jul.
6. Dahlof, C. G.; Hauge, A. W.; Olesen, J. Efficacy and safety of tonabersat, a gap-junction modulator, in the acute treatment of migraine: a double-blind, parallel-group, randomized study. Cephalalgia 2009 Nov;29 Suppl 2:7-16.
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10. Gupta, S.; Bhatt, D. K.; Boni, L. J.; Olesen, J. Improvement of the closed cranial window model in rats by intracarotid infusion of signalling molecules implicated in migraine. Cephalalgia 2009 Apr.
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12. Hansen, J. S.; Bendtsen, L.; Jensen, R. Psychometric properties of the Danish versions of headache-specific locus of control scale and headache management self-efficacy scale. J Headache Pain 2009 Oct;10(5):341-347.
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14. Hauge, A. W.; Asghar, M. S.; Schytz, H. W.; Christensen, K.; Olesen, J. Effects of tonabersat on migraine with aura: a randomised, double-blind, placebo-controlled crossover study. Lancet Neurol 2009 Aug;8(8):718-723.
15. Jensen, R.; Bendtsen, L. Medication overuse headache in Scandinavia-comments and questions. Cephalalgia 2009 Jul.
16. Katsarava, Z.; Dzagnidze, A.; Kukava, M.; Mirvelashvili, E.; Djibuti, M.; Janelidze, M.; Jensen, R.; Stovner, L. J.; Steiner, T. J. Prevalence of cluster headache in the Republic of Georgia: results of a population-based study and methodological considerations. Cephalalgia 2009 Sep;29(9):949-952.
17. Katsarava, Z.; Dzagnidze, A.; Kukava, M.; Mirvelashvili, E.; Djibuti, M.; Janelidze, M.; Jensen, R.; Stovner, L. J.; Steiner, T. J. Primary headache disorders in the Republic of Georgia: prevalence and risk factors. Neurology 2009 Nov;73(21):1796-1803.
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6. Clinical organization and staff

Management

Rigmor Jensen - Professor, MD, DrMedSci. Director of The Danish Headache Centre.

Jes Olesen - Professor, MD, DrMedSci. Founder and co-director of The Danish Headache Centre.

Lars Bendtsen - MD, Ph.D., DrMedSci, associate professor. Co-director of The Danish Headache Centre.

Helle Jensby - BSc Economics and business adm., Med. sec. Team leader in The Danish Headache Centre.

Staff Neurologists

Peer Tfelt-Hansen - MD, DrMedSci, associate professor.

Messoud Ashina - MD, Ph.D., DrMedSci, associate professor. Director of Human Migraine Research Group.

Thue Hjortkær Nielsen – MD. Leader of department of inpatient treatment of headache patients, senior consultant.

Carl Dahlöf - MD, DrMedSci, senior consultant.

Medical secretaries

Karin Aagaard
Katrine Kristensen
Tina Kærgaard
Jane Sandby
Dorte Helmundt
Lis Jønsson
Dianna Bartolin
Ane Lundgaard Dahl

Physiotherapists

Bjarne Madsen
Nina Caspersen
Jeanne Hirsvang
Lotte Skytte Krøll (sub)

Psychologists

Dorthe Kjeldgaard Nielsen
Bruno Vinter
Trine Zimmer

Nurses

Annette Vangaa Rasmussen
Annette Fjeldborg Jonassen
Hjørdis Rasmussen (assistent)

Psychiatrist

Marianne Nilsson, Department of Psychiatry, Glostrup Hospital

Gynaecologist

Birgit Hansen, Department of Gynaecology, Glostrup Hospital

Dental expertise

Professor, dr. odont Peter Svensson
Department of Oral Physiology, Institute of Odontology, University of Aarhus

Anaesthesiologist

Jonna Fomsgaard, Department of Anaesthesiology, Glostrup Hospital

7. Clinical Activities

The clinical activities in DHC consist of a multidisciplinary out-patient service and an in-patient service. At the end of 2009 the staff consisted of 3 psychologists, 3 physical therapists, 3 nurses, 1 team leader, 1 laboratory technician, 7 secretaries (several part time jobs), 7 neurologists specialized in headache (all part time), 1 psychiatrist (one day per week), 1 dentist (one day per month) and a variable number of younger physicians (all part time). In addition, nurses at the Department of Neurology N 38 take care of the in-patients.

The out-patient activities continued to be at a very high level in 2009. A total of 2.465 patients were treated in the centre during 2009. The demand for treatment is still increasing leading to longer waiting lists by the end of the year. Approximately 120 patients have been treated at the in-patient department N 38.

A total of 68% of patients were referred from The Capital Region, while the rest of patients were referred from other parts of Denmark and Scandinavia.

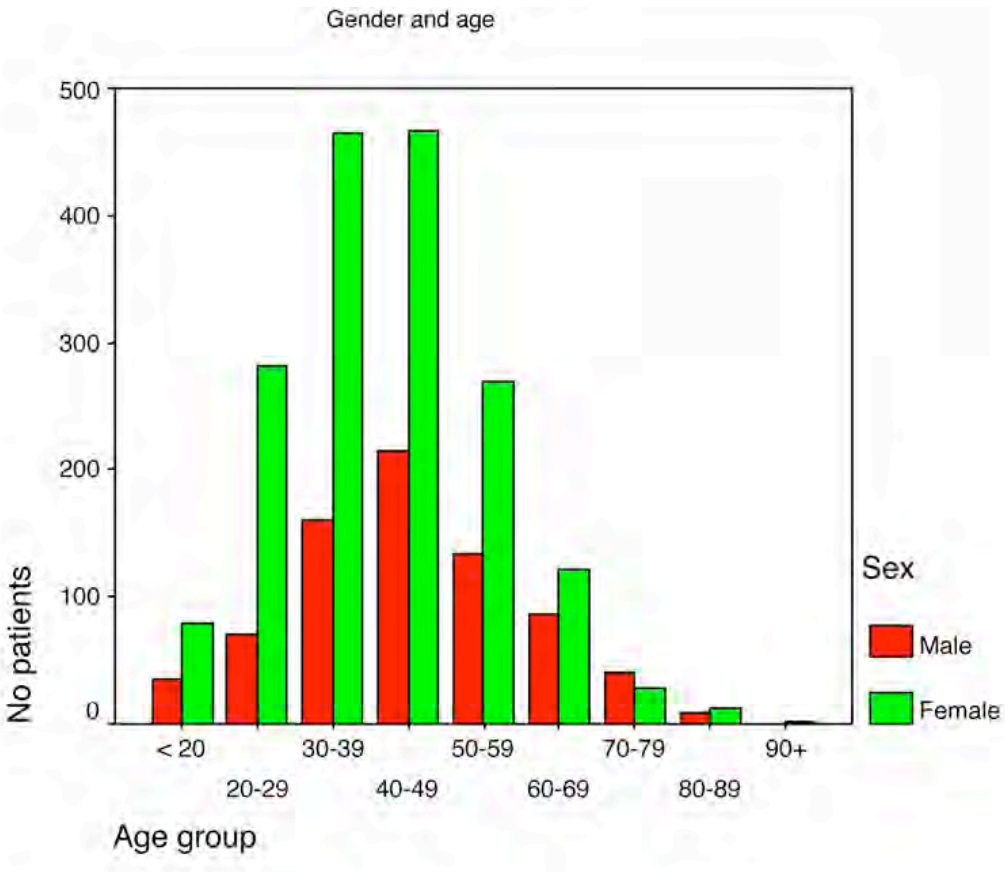

Figure 2. Numbers of patients by gender and age in 2009 (n=2.465). The female/male ratio was 2.3 and the mean age of our patients was 41 years with a range from 14 to 90 years.

Relative frequencies of major diagnostic categories in 2009

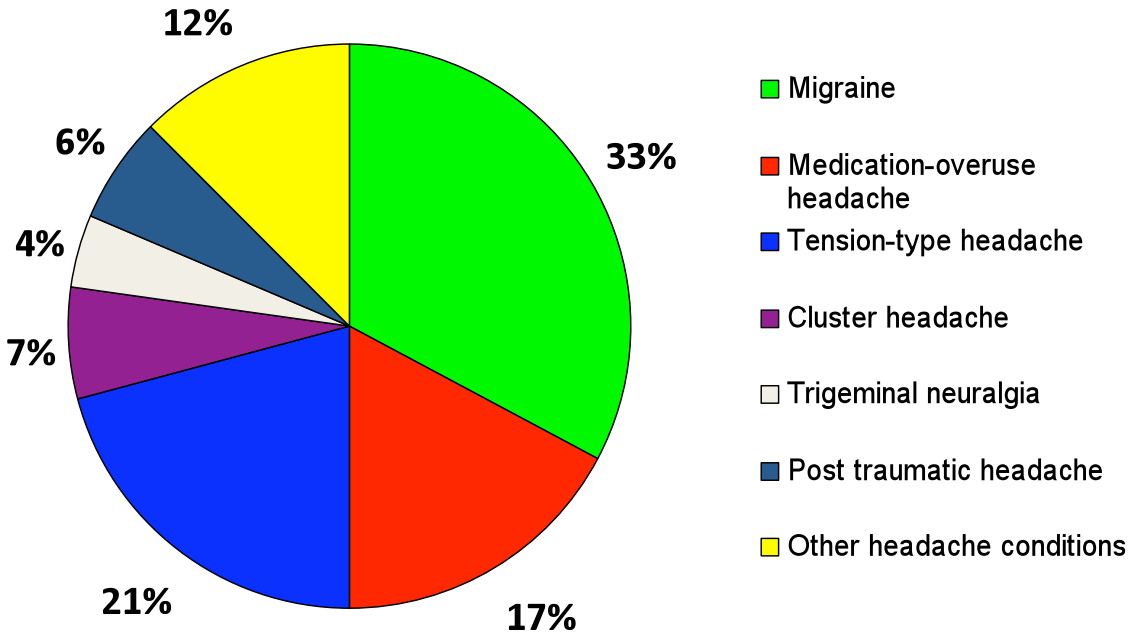

Figure 3. Migraine, medication-overuse headache, tension-type headache and combinations hereof are the most common types of headache seen in the centre.

The in-patient headache service

Six beds at the Department of Neurology N38 are allocated to the in-patient programme. The majority of patients are suffering from medication-overuse and are admitted for detoxification. In addition, patients suffering from other types of headache can be admitted for observation, certain specialized diagnostic procedures or treatment that requires hospitalization. The medication-overuse patients are all primarily seen on an out-patient basis in the Centre and then admitted for a fixed in-patient period of 14 days and follow a structured regime. After discharge they are closely followed as out-patients in DHC for at least one year.

8. Perspectives

We aim to continue the high research productivity, and facilitate scientific documentation and development of the treatment strategies in the Danish Headache Centre. It is of utmost importance to improve the quality of the services offered to our patients, and increasingly try to combine basic experimental research with clinical experience on a daily basis in order to develop new therapeutic avenues. We aim to continue to develop the Danish Headache Centre in order to achieve our goal to be in among the leading international centres for headache and neurological pain.

Editors:
Lars Bendtsen
Rigmor Jensen
Jes Olesen

Frontpage:
Trigeminal nucleus caudalis
Trigeminal ganglion

CGRP containing neurons (green) in trigeminal nucleus caudalis and trigeminal ganglion. The blue Dapi staining shows cell nuclei in the two preparations.

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