Contents

Congress Secretariat
MCI Gothenburg
Kastellgatan 1
413 07 Göteborg
SWEDEN

Phone: +46 (0)31 780 30 30
Fax: +46 (0)31 780 30 35
E-mail: info@sfss2008.se

mci

Welcome to Skövde, Sweden

Dear Colleagues and Friends,

Welcome to Skövde, to the 1st Swedish Sleep Medicine Congress and the 17th Annual Meeting of the Swedish Sleep Research and Sleep Medicine Society.

During the last decade, sleep medicine has established its place in scientific and teaching programs of many international meetings of pulmonology, otorhinolaryngology, neurology, neurophysiology, internal medicine, psychiatry, psychology, pediatrics, nursing and many other specialties. In accordance with the acknowledgment of sleep medicine as an independent discipline and subspecialty in many countries, we believe that, this congress will promote accreditation for the practice of sleep medicine in Sweden as well as in the other Nordic countries.

The scientific programme including the pre-congress postgraduate courses aim to cover the latest scientific findings in sleep physiology and sleep related disorders. The topics such as sleep disturbances in children and adolescents, restless legs syndrome, insomnia, daytime sleepiness and its consequences in the traffic, obstructive and non-obstructive sleep related breathing disorders with cardiovascular complications as well as the controversies and practical issues regarding the treatment of these disturbances are highlighted.

I would like to thank all of our honored international and national lecturers for accepting the invitation to this congress and all participants for their contribution with original papers. I would like to thank Prof. Eva Svanborg and Prof. Jan Hedner for their back-up regarding the scientific programme as well as The Board of the Swedish Sleep Research and Sleep Medicine Society, for their support for holding the 1st Congress of the Society in Skövde. The support from the staff of the Research Center of the Skaraborg Hospital for the postgraduate courses, the professional assistance of the MCI Congress Secretariat as well as the financial support from the CPAP- and drug industry are also acknowledged and highly appreciated.

Once again, You are cordially welcome to Skövde, to enjoy the exciting scientific as well as the social programme!

Yüksel Peker, MD, PhD, Associate Professor
Sleep Medicine Unit, Skaraborg Hospital, Skövde
Chair of the Swedish Sleep Medicine Congress 2008

Welcome address of the president

Dear members of the Swedish Sleep Research and Sleep Medicine Society (SFFS), Dear participants of our congress in Skövde

I am delighted to welcome you to our congress and to three days of exciting presentations, discussions, and social events. Our Society has chosen the Congress form for its annual meeting this year. The recent developments in Sleep Research and Clinical Sleep Medicine as well as the progress made for structural and procedural quality assessments in Sleep Medicine have certainly justified this decision. This year, for the first time, we have also extended a special invitation to colleagues from other Nordic countries.

The intensified educational activities in our society have resulted in two postgraduate courses on methodological and clinically important topics. The overwhelming interest in these courses has convinced us of the importance of similar activities at future meetings. I wish all course participants exciting days of interaction with the lecturers.

Yüksel Peker, our congress chair, has invited a group of internationally highly respected scientists, Collin Sullivan, Markku Partinen, Poul Jennum, Juliane Winkelmann, Nava Zisapel and Thomas Fetch. We are convinced that they will bring us novel and exciting data in both fundamental Sleep Research and clinical Sleep Medicine. In line with our tradition, we also look forward to discussing recent advancements in the Swedish sleep research, in particular, the work of our young scientists. We will also specifically focus on important and sometimes controversial topics with implications for our daily clinical work (SBU report/ traffic safety issues). Critical, open and hopefully very fruitful discussions are expected. Finally, I would like to invite all members of our society warmly to our annual business meeting.

During the congress, you will be able to find a place for social interaction, for meetings with new and old friends and colleagues, and to exchange ideas on sleep and related issues. In particular, our society hopes that all first-time visitors of the SFSS will find themselves warmly welcome as new members.

Väl Mött!

Ludger Grote, MD, PhD, Associate Professor
Sleep Lab, Dept of Pulmonary Medicine, Sahlgrenska University Hospital, Gothenburg
President of the Swedish Sleep Research and Sleep Medicine Society

Sifrol® vid
RESTLESS LEGS SYNDROM (RLS)*

Rofyllda
NÄTTER[1,2]

Piggare
DAGAR[1]

RLS kännetecknas av besvärliga "myrkrypningar". Det kryper, suger eller spänner inne i benen, en oro som gör att det inte går att hålla dem stilla framförallt i vila och nattetid.[3-6] Nattsömnen blir dålig[7,8] vilket ger klassiska sömnbristsymtom. RLS försämrar dina patienters livskvalitet[9] och hälsa.[10]

I fyra placebo-kontrollerade kliniska studier med ca 1 000 patienter med måttlig till mycket svår idiopatisk restless legs minskade Sifrol symtomen signifikant vs. placebo på både natten och dagen.[1,2]

Sifrol® (pramipexol) N04BC05 Rx F. Tablett 0,18, 0,35 resp. 0,7 mg. **Indikation:** Symtomatisk behandling av måttligt till svårt idiopatiskt restless legs syndrom i dosering upp till 0,54 mg bas (0,75 mg salt). **Pris och förpackningar:** 0,18 mg 30 st blister 194 kr, 100 st blister 542,50 kr. 0,35 mg 100 st blister 1 038 kr. 0,7 mg 100 st blister 2 029 kr. (Prisuppgift 2007-12-04). För senaste prisuppgift samt ytterligare information se www.fass.se. Datum för senaste översyn 08/2006.

Informationen sammanställdes och granskades februari 2008.

Sifrol®
pramipexol

Referenser: 1. Oertel WH, Stiasny-Kolster K, et al. Mov Disord 2007; 22:213–9. **2.** Partinen M, et al. Sleep Med 2006; 7:407–17. **3.** Tison et al. Neurology 2005; 65:239–46. **4.** Nichols DA et al. Arch Intern Med 2003; 163:2323–9. **5.** Berger K et al. Arch Intern Med 2004; 164:196–202. **6.** Ekbom K et al. Läkartidningen 2006; 4:207–11. **7.** Montplaisir J et al. Mov Disord 1997; 12:61–5. **8.** Winkelmann J et al. Sleep 2000; 23:597–602. **9.** Rothdach AJ, Trenkwalder C, Haberstock J. Neurology 2000; 54:1064–8. **10.** Hening W et al. Sleep Med 2004; 5:237–46.

Boehringer Ingelheim

Box 47608, 117 94 Stockholm | Tel 08-721 21 00 | Fax 08-710 98 84 | www.boehringer-ingelheim.se

About Skövde
Skövde is a big city in miniature. The city can offer a big variety of entertainment, restaurants, shops, culture, sports and fantastic surroundings. The town of Skövde, with its population of around 50 000 is conveniently situated between west Europe's two largest lakes, at the foot of the flat-topped hill Billingen. The town is the hub of a region that has around 200 000 inhabitants.

The main sources of employment in the area are the two Volvo engine plants, the regional hospital, the Ministry of Defence and the Local Authority. There are also many people working with education and training, in both the public and the private sectors.

Cloakroom
Coats can be left in the cloakroom in the hotel lobby.
Please note that this is an unattended cloakroom, don't leave any valuables!

Coffe/Tea breaks
Coffe/Tea and refreshments will be served during breaks in the Exibition Area in the lounge at Billingehus.

Exhibition
The exhibition is situated in the lounge at Billingehus and is open the following hours:
Thursday 3 April 08.00 - 18.00
Friday 4 April 10.15 - 15.00

Internet access
There is free Internet access available at Billingehus, and you can get access codes at the hotel reception on the ground level.

Lunch
Lunches on 3-4 April will be served in the restaurant at Billingehus.
The coffee/tea after the lunches will be served in the exhibition area.

Name badge
Your name badge that was given to you when you registered is your admission to the congress, please make sure you wear it at all times! Please also wear your name badge during the social events.

Official hotels
These are the official hotel of the congress:
First Hotel Billingehus Phone: +46 (0)500 - 44 57 00
Scandic Billingen Phone: +46 (0)500 - 74 50 00

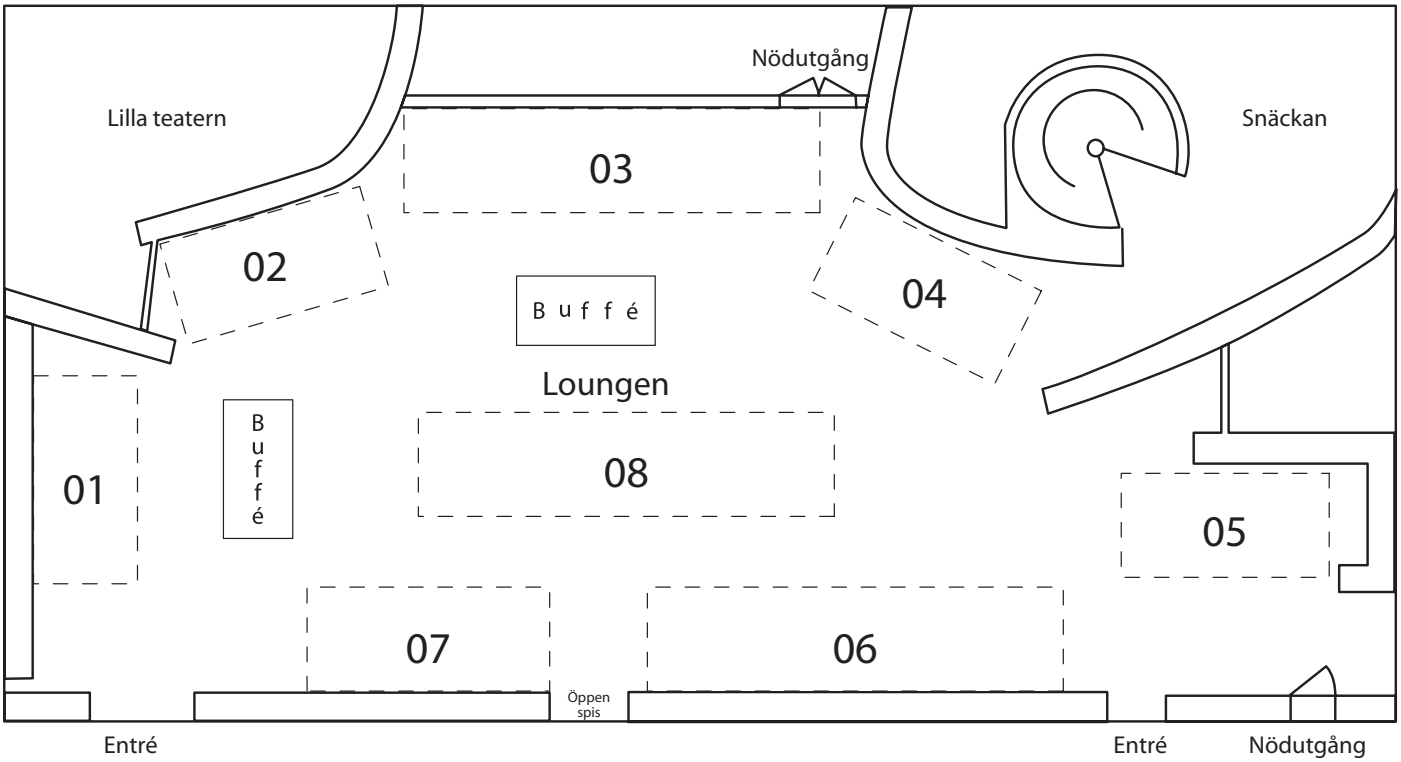
Registration desk
The registration desk is situated to the right from the entrance at Billingehus.
Please contact a member off staff at the desk if you have any queries or concerns during the congress.
The official opening hours of the registration desk are:
Wednesday 2 April 18.00 - 19.30
Thursday 3 April 08.30 - 18.00
Friday 4 April 07.30 - 14.00

In case you need to urgently contact the secretariat, please call: +46 (0)707 - 66 21 60.

Social Programme
Get- together Dinner - Wednesday 2 April at 19.30
A welcome buffet will be served in the restaurant at Billingehus.
Only if you are pre registered for this dinner.

Congress Dinner - Thursday 3 April at 19.30
The Congress Dinner will take place at the restaurant at Billingehus.
There will be a dinner buffet with seating areas in the restaurant.
Only if you are pre registered for this dinner.

Please note that there are food and *non alcohol* beverage included in the welcome buffet and the congress dinner.
Wine or beer tickets can be bought separately to a reduced price at the Hotel Reception. The bar in the restaurant will also be open for buying beer or wine.



01: Aiolos Medical AB
02: Algol Pharma Oy
03: Boehringer Ingelheim AB
04: Fisher and Paykel Healthcare AB
05: Organon AB
06: Nycomed AB
07: Breas Medical AB
08: Resmed Sweden AB

Foyer Exhibitor:
Active Care Sverup AB

Polysomnography - from theory to practice

Chair: Prof. Eva Svanborg

Wednesday, April 2, 2008
at Skaraborg Hospital

09.00 - 10.00 **Coffee and course registration**

10.00 - 11.30 **Polysomnography: When is it relevant as a diagnostic tool?**
Basic rules for sleep stage scoring according to Rechtschaffen och Kales. Rules for arousal scoring. Analysis of respiratory disturbances and periodic limb movements. Common types of artefacts, to be avoided.

11.30 - 12.30 **Multiple Sleep Latency Test (MSLT); rules for execution of the test.**
Preparations before polysomnography and MSLT: Examples of useful questionnaires concerning the patient´s general sleeping habits and daytime situation. Sleep diaries. Actigraphy.

12.30 - 13.30 **Lunch**

13.30 - 15.00 **Practical scoring sessions of digitized recordings. 2 persons per computer.**
Examples from patients recorded with the Embla system (PSG) or Nervus software (MSLT).

Teachers: Eva Svanborg, Lena Harder (MD),
Magdalena Osk Sigurgunnarsdóttir (english speaking RPT), David Lorr (instructor)

15.00 - 15.30 **Coffee**

15.30 - 16.30 **Run-through of the different cases; conclusion of the course with diplomas for the participants.**

At First Hotel Billingehus

18.00 - 19.30 **Congress registration**
19.30 - **Get-together Dinner**

Obstructive Sleep Apnea (OSA) – a clinical overview

Chair: Prof. Jan Hedner

Wednesday, April 2, 2008
at Skaraborg Hospital

09.00 - 10.00 **Coffe and course registration**

10.00 - 10.15 **Introduction**
(Prof. Jan Hedner, Gothenburg**)**

10.15 - 11.00 **Epidemiology of OSA**
(Assoc. Prof. Eva Lindberg, Uppsala**)**

11.00 - 11.45 **OSA & Risks related to cognitive disturbance and daytime sleepiness**
(Assoc. Prof. Markku Partinen, Helsinki)

11.45 - 12.30 **Diagnosis and general treatment aspects of OSA**
(Prof. Colin Sullivan, Sydney)

12.30 - 13.30 **Lunch**

13.30 - 14.15 **OSA & Obesity – endocrine and metabolic implications**
(Prof. Jan Hedner)

14.15 - 15.00 **OSA & Hypertension**
(Assoc. Prof. Ludger Grote, Gothenburg)

15.00 - 15.30 **Coffee**

15.30 - 16.15 **OSA & Coronary Artery Disease and Stroke**
(Assoc. Prof. Yüksel Peker, Skövde)

16.15 - 16.30 **Conclusion of the course with diplomas for the participants**
(Prof. Jan Hedner)

At First Hotel Billingehus

18.00 - 19.30 **Congress registration**
19.30 - **Get-together Dinner**

Thursday, April 3, 2008
First Hotel Billingehus

07.00 - 09.00 **Congress registration**

09.00 - 09.15 **Welcome address**
- **Yüksel Peker,** Skövde; Congress chair
- **Ludger Grote,** Gothenburg; President of the Swedish Sleep Research and Sleep Medicine Society

09.15 - 11.45 **SESSION 01: Sleep disturbances in children and adolescents**
Chairs: Colin Sullivan, Sydney; **Lars Palm,** Malmö

09.15 **Lars Palm,** Malmö
- Disturbances of the sleep and wake rhythm in children and adolescents

09.35 **Poul Jennum,** Glostrup, Denmark
- Hypothalamus, function and dysfunction - narcolepsy in young people

09:55 **Marianne Ors,** Lund
- Sleep problems in children with neurodevelopmental disturbances

10.15 **Colin Sullivan,** Sydney, Australia
- Diagnosis and treatment of sleep apnea in children

10.45 - 11.15 **Coffe**

11.15 - 11.45 **Poster discussion**

P. Garmy, P Nyberg, Lund
- Sleep length, television and computer habits of primary school children (Poster 01)

E. Eriksson, I Lundeborg, J Graf, A McAllister, E Hultcrantz, Linköping
- Child behaviour and quality of life before and after tonsillotomy versus tonsillectomy (Poster 02)

B. Tideström-Löftstrand, A. Linder, E. Hultcrantz, Uppsala
- The development of snoring up to 12 years and the effects of surgery (Poster 03)

L. Harder, A. Broström, H . Harder, E. Svanborg, Linköping
- Snoring during pregnancy and its relation to pre-eclampsia and restless legs syndrome (Poster 04)

11.45 - 12.00 **Poster viewing**

12.00 - 13.00 **Lunch**

13.00 - 13.50 **SESSION 02: Restless Legs Syndrome & Periodic Limb Movements**
Chair: Jan Ulfberg, Avesta

13.00 **Jan Ulfberg,** Avesta
- An update of the clinical practice –Diagnosis and treatment of Restless Legs Syndrome

13.20 **Juliana Winkelmann,** Munich, Germany
- Genetics of Restless Legs Syndrome: New perspectives

13.50 - 14.30 **SESSION 03: Non-obstructive Sleep Related Breathing Disorders**
Chairs: Eva Lindberg, Uppsala; **Richard Harlid,** Stockholm

13.50 **Ludger Grote,** Gothenburg
- Complex Sleep Apnea Syndrome & Cheyne-Stokes Respiration - Is there a relationship?

14.10 **Thomas Fetsch**, Munich, Germany
- Serve-Heart Failure Study (sponsored by ResMed)

14.30 - 15.00 **Coffe**

15.00 - 16.20 **SESSION 04: Vigilance, Sleepiness & Sleepy Drivers**
Chairs: Torbjörn Åkerstedt, Stockholm; **Jan Hedner,** Gothenburg

15.00 **Torbjörn Åkerstedt,** Stockholm
- The impact of reduced vigilance and sleep in the traffic environment

15.20 **Per-Olle Haraldsson,** Stockholm
- Sleep apnea and accident risk. Impact of recognition and treatment

15.40 **Jan Hedner,** Gothenburg
- Medico-legal implications of sleep apnea: Future European perspectives

15.50 - 16.20 **General discussion and posters**
D. Eder, D. Zou, L. Grote, J. Hedner, Gothenburg
- Deficits in sustained attention during wakefulness are not revealed by the Epworth Sleepiness Scale (P 05)

D. Eder, D. Zou, L. Grote, J. Hedner, Gothenburg
- Are you paying attention to the consequences of sleep disorders on waketime functioning? (Poster 06)

H. Petersen, A. Lowden, T Åkestedt, Stockholm
- Effect of bright light on sleep and readaptation after night work Poster 07)

L. Larsson, G. Kecklund, J. Nilsson, Stockholm
- Heart rate variability during sleep in burnout patients (Poster 08)

16.20 - 16.40 **SESSION 05 : Basic sleep**
Chair: Arne Lowden, Stockholm

John Axelsson, Stockholm
- Sleep and cytokines

16.40 - 17.40 **SESSION 06: Insomnia**
Chairs: Markku Partinen, Helsinki; **Lena Mallon,** Säter

16.40 **Nava Zisapel,** Tel Aviv, Israel
- Melatonin and insomnia (sponsored by Nycomed)

17.00 **Markku Partinen,** Helsinki, Finland
- Are we still awake? – An update of the clinical practice in insomnia

17.20 -17.40 **General discussion and posters**
N. Mehrabadi, J-E Broman, Uppsala
- Polysomnography in insomnia: what about the representativity? (Poster 09)

K. Bothelius, Säter, **L. Arvidsson,** Falun, **J. Ulfberg,** Avesta, **C. Espie,** Glasgow, **J-E Broman,** Uppsala
- Cognitive behaviour therapy for insomnia comorbid with pain: An uncontrolled pilot study of effects on pressure pain threshold assessed with algometer (Poster 10)

17.40 **Break**

17.45 - 18.45 **ÅRSMÖTESHANDLINGAR (SFSS) – Business meeting of the Swedish Sleep Research and Sleep Medicine Society**

19.30 - **Congress Dinner**

Friday, April 4, 2008

08.00 - 09.30 **SESSION 07: Gender differences in sleep disorders**
Chairs: Jerker Hetta, Stockholm; **Eva Lindberg,** Uppsala

08.00 **Jerker Hetta,** Stockholm
- Gender differences in insomnia

08.20 **Jan Ulfberg,** Avesta
- Gender differences in Restless Legs Syndrome & Periodic Limb Movements

08.40 **Eva Lindberg,** Uppsala
- Gender differences in obstructive sleep apnea

09.00 **Yüksel Peker,** Skövde
- Gender differences in cardiovascular complications of sleep apnea

09.20 - 09.30 **General discussion and posters**

E. Thunström, S. Thorvaldsson, J. Hedner, L. Grote, Y. Peker Skövde, Gothenburg
- Impact of gender on the relationship between obstructive sleep apnea and hypertension in an otherwise healthy middle-aged sleep clinic cohort (Poster 11)

L. Grote, N. Dursunoglu, P. Hermann, J. Hedner, Gothenburg, Marburg
- Menopause and cardiovascular risk factors in sleep apnea (Poster 12)

09.30 - 10.30 SESSION 08: Obstructive sleep apnea : non-CPAP therapies

Chair: Anette Fransson, Örebro; **Danielle Friberg,** Stockholm

09.30 **Åke Tegelberg,** Västerås
- An update of the scientific evidence of the clinical outcomes of mandibular advancement therapy of sleep apnea

09.50 - 10.30 **General discussion and posters**

A. Andren, Å. Tegelberg, Västerås
- Effects on blood pressure after treatment of obstructive sleep apnea with an oral appliance with mandibular advancement, a 3 year follow-up (Poster 13)

K. Lundkvist, A. Januszkiewicz, D. Friberg, Stockholm
- UPPP is an alternative to your OSAS patients who have failed conservative treatment (Poster 14)

F. Cinar, M.B. Ugur, E. Tas, Zonguldak, Turkey
- Radiofrequency uvulopalatoplasty with a single suture (Poster 15)

P. Nerfeldt, B.Y. Nilsson, L. Mayor, S. Rössner, J. Uddén, D. Friberg, Stockholm
- Metabolic status and nocturnal respiration is improved by weight reduction in obese OSAS patients (P 16)

M. Karimi, J. Koranyi, C. Franco, Y. Peker, D. Eder, J-E Angelhed, L. Lönn, L. Grote, B-Å Bengtsson, J. Svensson, G. Johannsson, J. Hedner, Gothenburg, Skövde, Copenhagen
- The effect of 12-month growth hormone treatment on obstructive sleep apnoea in abdominally obese men (Poster 17)

10.30 - 11.00 Coffe

11.00 - 11.30 SESSION 09: Nordic report - Obstructive sleep apnea-

Chairs: Poul Jennum, Glostrup; **Sören Berg,** Lund

11.00 **Karl Franklin,** Umeå
- Summary of the "SBU" (Nordic) report excluding ENT surgery

11.20 **General discussion**

11.30 - 12.30 SESSION 10: Pro-Con Debate – ENT surgery in OSA

Chair: Eva Svanborg, Linköping

11.30 **Per-Olle Haraldsson,** Stockholm
- PRO: There IS need for ENT surgery in the treatment of OSA (Round I)

11.45 **Karl Franklin,** Umeå
- CON: There IS NO need for ENT surgery in the treatment of OSA (Round I)

12.00 **Per-Olle Haraldsson,** Stockholm
- RESPONSE PRO: There IS need for ENT surgery in the treatment of OSA (Round II)

12.10 **Karl Franklin,** Umeå
- RESPONSE CON: There IS NO need for ENT surgery in the treatment of OSA (Round II)

12.20 **Voting**

12.30 - 13.30 Lunch

13.30 - 14.00 SESSION 11: Obstructive Sleep Apnea – Cardiovascular Morbidity

Chairs: Karl Franklin, Umeå; **Yüksel Peker,** Skövde

Poster discussion

J. Hedner, L. Grote, A-C Lundquist, J Norum, Gothenburg
- An European multi-centre long-term observational cohort (ESADA – European Sleep Apnea DAtabase) within the frame COST action B26 (Poster 18)

A. Ståhlkrantz, J. Albers, J. Wiberg, F. Nyström, O. Sunnergren, M. Ulander, E. Svanborg, A. Broström, Jönköping, Linköping
- Clinical characteristics in hypertensive patients with or without risk of OSA – Preliminary data from HYPERSLEEP study group (Poster 19)

L. Grote, J. Hedner, D. Sommermeyer, D. Zou, D. Eder, Gothenburg, Karlsruhe (Germany)
- Prediction of cardiovascular risk by overnight recordings of autonomic signals in patients with suspected sleep disorders (Poster 20)

D. Zou, L. Grote, J, Radlinski, D. Eder, U. Lindblad, J. Hedner, D. Sommermeyer, D. Zou, D. Eder, Gothenburg, Rabka-Zdrój (Poland), Skövde, Malmö
- Nocturnal pulse wave attenuation is associated with daytime blood pressure in a population based cohort (Poster 21)

H. Glantz, E. Thunström, A. Kallryd, J. Ejdebäck, J. Herlitz, Y. Peker, Skövde, Lidköping, Gothenburg
- High prevalence of obstructive sleep apnoea in revascularized patients with coronary artery disease – RICCADSA trial (Poster 22)

14.00 - 14.30 SESSION 12: Obstructive Sleep Apnea – CPAP treatment
Chairs: Jan Hedner, Gothenburg; **Michael Lysdahl,** Stockholm

Poster discussion

A. Broström, K. Franzen, A. Strömberg, A. Ståhlkrantz, J. Albers, M. Ulander, E. Svanborg, Linköping, Jönköping
- The side effects to CPAP treatment Inventory (SECI): validity and reliability of the first self-assessment inventory of side-effects to CPAP treatment (Poster 23)

M. Ulander, A. Strömberg, J. Mårtensson, L. Harder, E. Svanborg, A. Broström, Linköping, Jönköping
- High prevalence of Type D personality among CPAP users and correlation to perceived side effects and adherence (Poster 24)

A. Broström, A. Ståhlkrantz, J. Albers, J. Wiberg, M. Ulander, P. Nilsen, E. Svanborg, Linköping, Jönköping
- How can we use Problem Based Learning (PBL) in an educational program when initiating CPAP treatment in patients with OSAS? (Poster 25)

D. Friberg, S. Myrin, M. Lind-Härmä, F. Aoki, Stockholm
- Acceptance for the use of Auto-CPAP among patients with Upper Airway Resistance Syndrome (Poster 26)

U. Paija, S. Nilisse, M. Wallander, J. Hedner, L. Grote, Gothenburg
- Comparison of three different methods for delivery of CPAP therapy (Poster 27)

14.30 - 15.00 Coffe

15.00 - 16.00 SESSION 13: Accreditation of sleep centers and sleep specialists
Chairs: Markku Partinen, Helsinki; **Ludger Grote,** Gothenburg

15.00 **Markku Partinen,** Helsinki, Finland
- Experiences from Finland

15.15 **Poul Jennum,** Glosturp, Denmark
- Experiences from Denmark

15.30 **Sören Berg,** Lund
- The Nordic perspective

15.45 **Ludger Grote,** Gothenburg
- Concluding remarks - Future practice in Sweden

16.00 - 16.15 Closing ceremony – See you in Uppsala, March 12-13, 2009!

Abstracts

1. Sleep length, television and computer habits of primary school children

Pernilla Garmy, MNSc*, Per Nyberg, PhD**
*School Health Care, Vårfruskolan, Råbygatan 8, SE-223 61 Lund, Sweden; pernilla.garmy@lund.se
**Department of Health Sciences, Lund University, Box 157, SE-221 00 Lund, Sweden; per.nyberg@med.lu.se

Objective
The aim of the study was to investigate length of sleep, television and computer habits, difficulties in sleeping, and feeling of tiredness in school in primary school children.

Methods
A questionnaire concerning length of sleep and television and computer habits was given to 129 children 9-12 years of age from two public primary schools in southern Sweden during 2007 and early in 2008. For each of the school grades involved, differences in television and computer habits between children in the lowest quartile and in the remaining quartiles in reported length of sleep were investigated (Chi-Square and Fisher Exact tests).

Results
The mean length of sleep per night was 9 h 45 min during the week and 10 h 37 min on weekends. Those sleeping less reported being tired in school more frequently (p=0.012). Spending more than two hours a day either at the computer or watching TV was likewise associated with more frequently being tired in school (p=0.001). Both having bedroom TV and spending more than two hours a day at the computer or watching TV were found to be associated with sleeping less (p=0.043 and p=0.033, respectively).

Conclusions
It is an important task of school health care to clarify for parents of primary school children the effects that a TV set being located in the child's bedroom can have on the child's length of sleep and feeling of tiredness in school.

Key words
Sleep Length, Television, Computer, Primary School Children

Abstract

1

2. Child behavior and quality of life before and after tonsillotomy versus tonsillectomy.

Ericsson E, CRNA, PhD, Lundeborg I, MS, Graf J, MD, McAllister A, PhD, Hultcrantz E, MD, PhD.
Dept of Clinical and Experimental Medicine, Div. of Otorhinolaryngology, Linköpings university, Sweden

Objective
to compare two techniques for tonsil surgery with respect to postoperative pain and morbidity and changes in sleep, behavior, health related quality of life (HRQL) and benefit due to surgery.

Methods
67 pre-school children with tonsillar hypertrophy were randomized to regular tonsillectomy (TE) or tonsillotomy (TT) with Radiofrequency surgical technique.

The parents completed a validated quality of life survey, Obstructive Sleep Apnea-18 (OSA18) , assessed the children's behavior with the Child Behavior Checklist (CBCL) before and six month after surgery and evaluated the post-operative health related benefits using the Glasgow Children's Benefit Inventory (GCBI).

Results
TT-children recorded less pain from the first day, and were pain-free 3 days earlier than TE-children. Six months post-surgery, there was no difference between TT and TE with regard to snoring and ENT-infections.

The total scores in all the individual domains between the initial OSA-18 and post-surgery scores differed ($p<0.0001$). Improvement in CBCL score was also significant ($p<0.01$). There were no differences between TT- and TE-children. GCBI indicated a significant health benefit of both methods.

Conclusions
Tonsillar hypertrophy shows impact on HRQL and behavior. After tonsillar operation, improvements occur as much after TT as after TE. TT should be first choice for treatment.

Support
Financial support from the Research Council of SouthEast Sweden (FORSS).

Abstract
2

3. The development of snoring up to12 years and the effects of surgery.

Britta Tideström-Löfstrand, *Arne Linder* and Elisabeth Hultcrantz**
* Dep. of Surgical Sciences, University of Uppsala**

Two cohorts of children were followed to 12 years of age to study snoring and obstructive related symptoms and dentofacial development. 399 children were examined at 4, 6 and 12 years of age and 300 children at 6 and 12 years with a questionnaire, clinical examination and sleep studies and orthodontic evaluation.

Results
Out of 699 children answering the inquiry at the age of twelve, 37 snored every night and 419 did not snore at all. The main difference between those groups, except snoring, was the prevalence of mouth breathing: 79% resp. 5 % .

A total of 77 children were operated due to obstructive symptoms Of those solely adenoidectomized 12/37 (32%) were snoring every night at the age of twelve and 12/37 did not snore at all. Of those who had received adenotonsillectomy or tonsillectomy 5/40 (12%) snored every night at age 12 and 20 (50%) did not snore at all.

Conclusion
Adenotonsillectomy is more effective than solely adenoidectomy to prevent snoring in children but do not "cure" more than 50%. In the unsuccessful cases oral breathing is common, which might be cause of further negative dento- facial development. Control of change to nasal respiration after surgery is recommended.

Abstract

3

4. Snoring during pregnancy and its relation to pre-eclampsia and restless legs syndrome

Lena Harder, Maria Sarberg, Anders Broström, Henrik Harder and Eva Svanborg
Dept:s of Clinical Neurophysiology, Gynecology and ENT, Linköping University Hospital.

Objective
Does snoring during pregnancy influence development of pre-eclampsia and restless legs syndrome?

Method
503 women were given questionnaires during the 1st, 2nd and 3rd trimester, concerning snoring, subjective fatigue, ESS, edemas and restless legs symptoms. Women who indicated snoring often- always were denoted habitual snorers. They were offered a sleep respiratory recording (Embletta); 34 volunteered.

Results
36 women (7%) snored habitually at the first visit. In the 3rd trimester, 93/447 (21%) reported habitual snoring. Habitual snorers had higher average BMI at the first visit compared to non- snorers. 9/34 sleep recordings showed supine AHI >5. Two women who later developed pre-eclampsia were recorded; both had AHI >5.

18 women developed pre-eclampsia, twice as common among habitual snorers (6/93 = 6,5%) as in non-snorers (10/354 = (2,8), (n.s.).

In the first trimester RLS were present in 15% of non-snorers and 22 % of snorers, increasing to 29/32% in the 3rd (significant difference between snorers and non-snorers, $p<0,05$).

Conclusions
Habitual snoring increased markedly during pregnancy, as did RLS. Snoring and RLS were significantly related. Pre-eclampsia was twice as common among snorers, but the difference was not significant due to the low number of cases. The relation between pre-eclampsia and snoring therefore remains elusive.

Abstract
4

5. Deficits in sustained attention during wakefulness are not revealed by the ESS

Derek N. Eder, Ding Zou, Ludger Grote, Jan Hedner
Göteborgs Universitet, Centrum för Sömn och Vakenhetsstörningar, Vigilans och Neurokognitions Laboratori

We studied the maintenance of attention in 39 consecutive clinical sleep disorders patients with complaints of impaired waketime functioning. 19 of these patients were restudied after treatment. Trait ratings of fatigue and sleepiness were obtained with the Epworth Sleepiness Scale (ESS), Fatigue Impact Scale (FISk) and state assessments during testing with 100 mm visual analog scales (VAS).

Sustained attention was assessed from responses to visual stimuli presented at random intervals (3-10 seconds) over 20 minutes. These tests were performed twice during each assessment. The outcome measure reported is the number of missed responses to stimuli (lapses). Lapse behaviors and subjective reports were modeled using the General Estimating Equation (GEE) for Poisson distributed responses in the R statistical language.

Median number of lapses was 7 (IQR, range 2-43,165). Attention performance was predicted by both FISk (Z 2.6, p. 0.01) and VAS "difficulty fighting sleep" (Z 2.2, p. 0.03). VAS "alertness" was weaker (Z -1.8, p. 0.07). ESS was uninformative (Z 0.7, p. 0.5). These subjective ratings have, at best, only moderate informative value for sleep related deficits of attention while the ESS may greatly underestimate a significant risk pool.

Abstract

5

6. Are you paying attention to the consequences of sleep disorders on waketime functioning?

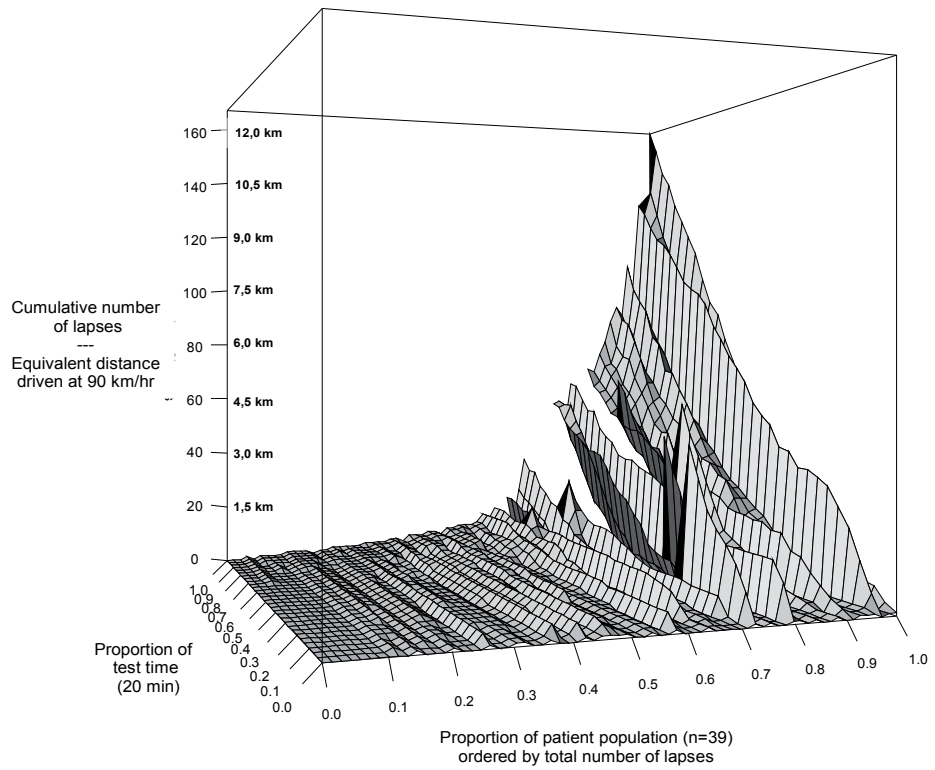
Derek N. Eder, Ding Zou, Ludger Grote, Jan Hedner
Göteborgs Universitet, Centrum för Sömn och Vakenhetsstörningar, Vigilans och Neurokognitions Laboratori

What are the consequences of sleep disorders on waketime functioning? Our responses are largely shaped by the instruments we have available to measure "daytime functioning": The objective MSLT, MWT, and Osler tests and subjective "sleepiness scales" such as the ESS, KSS, and SSS. Each focused squarely on sleep propensity.

But, in the real world, difficulties in wakeful functioning are more directly attributable to failures of attention than to sleepiness. Just consider your own accidents and injuries.

Using a simple, 20 minute test of attention (based on randomly presented visual stimuli), we have observed significant deficits in sustained attention in approximately 60% of patients with untreated sleep disorders (largely OSAS). These deficits are rarely associated with EEG sleep or sustained behavioral non-responsiveness. Rather, they manifest as short, transient periods of inattentiveness (lapses). Re-expressed as the distance traveled by a car at 90 km/hr, 50% of the tests resulted in total travel greater than 0.5 km and 25% between 3 and 12.5 km during states of attentional "blindness".

Clearly, "falling asleep at the wheel" represents only the tip of the risk iceberg and public health will benefit greatly as more people wake up to that fact.



Abstract
6

7. Effect of bright light on sleep and readaptation after night work

H. Petersen, A. Lowden and T. Åkerstedt
Stress Research Institute, Stockholm, Sweden

Objectives
Shift work is common in Sweden, particularly in the healthcare sector where most employees at some time work shifts. Disturbances of the circadian rhythms have negative effects on health and sleep and a quick readaptation to normal rhythm is therefore important. This study aims to evaluate the effect of bright light exposure on sleep and readaptation of the circadian rhythm after working nights during winter.

Methods
Fifteen female night nurses were exposed to both low intensity light (LL, 2200lux), and bright light (BL, 7000lux), for 2 consecutive free days preceded by 2 night shifts. Light was administered for 30-60 min in the morning at a distance of 50 cm from the eyes. The two light conditions were compared to a baseline condition. Sleep and sleepiness were assessed through motion loggers and sleep diaries.

Results
After BL exposure workers reported enhanced mood and alertness. Sleep length and sleep efficiency were not affected as measured through motion loggers but subjective sleep quality improved in connection with both BL and LL conditions.

Conclusion
Effects on mood and alertness may indicate an accelerated readaptation by bright light treatment.

Keywords
Sleep, shift work, circadian rhythm, bright light

Abstract
7

8. Heart rate variability during sleep in burnout patients

Lina Larsson, Göran Kecklund and Jens Nilsson
Stress Research Institute, Stockholm University

Objectives
Burnout is associated with sleep impairments, which possibly is connected to an elevated autonomic arousal. The purpose of this study was to investigate burnout patient's parasympathetic modulation during sleep via measurements of heart rate variability (HRV).

Methods
10 white-collar workers, mean age 41 years, on long-term sick leave for burnout, and 9 healthy controls, mean age 39 years, participated. The participants were subjected to one night of polysomnographic recording, with ECG (one sub-clavical lead), from which analysis of HRV was derived. The statistical analyses involved t-tests and repeated measures ANOVA.

Results
There were no group differences during NREM-sleep in HRV frequency components. One significant antagonistic interaction effect of group and time appeared: The HF increased for the control group between the first and last hour of NREM-sleep, while it decreased for the burnout group. Further, high frequency (HF) activity during REM was significantly lower in the burnout group. Very low frequency activity (VLF), low frequency activity (LF) and the ratio LF/HF did not differ between groups. The burnout group showed less slow wave sleep, which was associated with a high LF value.

Conclusions
The reduced HF activity during REM and NREM in burnouts might suggest an impaired parasympathetic modulation.

Abstract
8

9. Polysomnography in Insomnia: What About the Representativity?

Nayereh Mehrabadi and Jan-Erik Broman
Sleep Disorders Unit, General Psychiatry, University Hospital, Uppsala, Sweden

Background
It is sometimes suggested that sleep during polysomnography (PSG) substantially deviates from the habitual sleep due to disturbances from the recording procedure. The *First Night Effect* means that sleep during the first night of PSG is worse than usual and therefore should be regarded as an adaptation only. The aim of the study was to evaluate insomnia patients' ratings of their sleep during two nights of PSG.

Method
Forty-nine insomnia patients (18 men and 31 women) were evaluated with PSG during two consecutive nights at our Sleep Disorders Unit. The following morning they filled in a questionnaire comprising questions about their subjective ratings of the sleep.

Results
The majority of patients reported that they were not at all or only slightly disturbed by the recording procedure. Further, the majority of patients reported that sleep latency was equal to or only slightly shorter or longer than usual. In the same vein, the majority of patients reported that sleep length was equal to or only slightly shorter or longer than usual.

Conclusion
Most patients reported that their sleep was not or only slightly disturbed by the PSG procedure and neither sleep latency nor sleep length deviated substantially from their habitual sleep.

Conflict of Interest
The authors have no conflict of interest related with the work

Abstract

9

10. Cognitive behavior therapy for insomnia comorbid with pain: An uncontrolled pilot study of effects on pressure pain threshold assessed with algometer

Kristoffer Bothelius [a, b, *], Lennart Arvidsson [a], Jan Ulfberg [b, c], Colin Espie [d] & Jan-Erik Broman [e]
[a] Skönvik Medical Rehabilitation Clinic, Säter, Sweden.
[b] Center for Clinical Research Dalarna, Falun, Sweden.
[c] Sleep Disorders Center, Avesta Hospital, Avesta, Sweden.
[d] University of Glasgow Sleep Research Laboratory, Southern General Hospital, Scotland, UK.
[e] Department of Neuroscience, Psychiatry, University Hospital, Uppsala, Sweden.

[*] Corresponding author: Skönviks Medicinska Rehabiliteringsklinik, Box 350, 783 27 Säter. E-mail: kristoffer.bothelius@ltdalarna.se

Objective
Insomnia is a common comorbid problem in patients with chronic illness. It has been proposed that sleep disturbance could serve as a maintaining factor in e.g. chronic pain. This study investigates the effect on pressure pain threshold when treating insomnia in patients with chronic pain.

Method
An uncontrolled pilot study at an outpatient pain clinic. Five adults with chronic benign musculoskeletal pain and comorbid insomnia received 5 sessions of cognitive behavior therapy for insomnia, delivered in a group setting. Assessment was completed at baseline, after treatment and at 2- and 4-month follow-up visit.

Results
The patients improved from "clinical insomnia of moderate severity" to "sub threshold insomnia" on a brief self-report screening form. Sleep diaries showed a decrease in sleep onset latency, number of wakenings, and wake time after sleep onset while total sleep time increased. Assessment with algometer showed a significantly higher pressure pain threshold after treatment, although no longer significant at 4-month follow-up.

Conclusion
The results indicate that pressure pain threshold could be affected by treatment of comorbid insomnia in patients with chronic benign musculoskeletal pain. The study does not allow any conclusions on causality but calls for further investigation on the topic.

Conflict of interest
None.

Abstract
10

11. Impact of gender on the relationship between obstructive sleep apnoea and hypertension in an otherwise healthy middle-aged sleep clinic cohort

Erik Thunström[1], Stefan Thorvaldsson[2], Jan Hedner[2], Ludger Grote[2], Yüksel Peker[1,2]
[1]Sleep Medicine Unit, Skaraborg Hospital, Skövde,
[2]Sleep Laboratory, Dept of Pulmonary Medicine, Sahlgrenska University Hospital, Gothenburg, Sweden.

The influence of gender on the relationship between obstructive sleep apnoea (OSA) and hypertension was analyzed in a consecutive sleep clinic cohort (n=1323; 1013 men, 310 women; mean age 49.5 9.7, range 30-69 yrs). All participants were free of a known cardiac or pulmonary disease, diabetes mellitus, malignancy, psychiatric disorder or alcohol dependency at baseline. Hypertension was defined as systolic blood pressure >=140 and/or diastolic blood pressure >=90 mmHg and/or antihypertensive drug treatment at the time of the sleep recording (1993 to 1995). The prevalence of hypertension was 30.4 % in men and 33.9 % in women (n.s). OSA (Oxygen Desaturation Index [ODI]>=5/h) was observed in 38.5 % of men and 24.8 % of women (p<0.001). Compared with non-OSA, the odds ratio (OR) for hypertension was 1.6 for mild OSA (ODI 5.0-14.9/h), 1.9 for moderate OSA (ODI 15.0-29.9/h) and 3.2 for severe OSA (ODI >=30/h) with 95% confidence intervals (CIs) of 1.2-2.3, 1.2-3.0 and 1.9-5.5, respectively in men, after adjustment for age, Body-Mass-Index and smoking history. In women, however, no significant association was found between OSA and hypertension (ORs 1.4, 1.3, 0.8 and 95% CIs 0.8-2.8, 0.4-4.1, 0.2-3.4, respectively). To conclude, the present data from the sleep-clinic cohort confirm our previous report from a general population suggesting that the contribution of OSA to hypertension is gender–dependent and confined to males.

Abstract

11

12. Menopause and cardiovascular risk factors in sleep apnea

Ludger Grote[1], Nese Dursunoglu[1], Hermann Peter[2], Jan Hedner[1]
[1]Sleep Disorders Center, Sahlgrenska University Hospital, Gothenburg, Sweden
[2]Sleep Laboratory, Marburg University Hospital, Marburg, Germany.

Introduction
Previous data indicate that cardiovascular comorbidity in obstructive sleep apnea (OSA) differs between pre- and postmenopausal women. This study aimed to compare cardiovascular, respiratory and metabolic status in women with menopausal state classified by age.

Methods
Cross sectional study of a sleep laboratory cohort of 2475 consecutive patients (209 female and 2266 male). Pre- and post-menopausal females were defined by age (<45 yrs, n=20, 34.9±6.9 yrs and >55 yrs, n=50, 62.4±5.0 yrs, respectively). A group of 816 males fulfilling the corresponding age criteria were identified as controls. A level III sleep study was performed, blood pressure, blood chemistry, respiratory function and blood gases were assessed.

Results
The prevalence of severe OSA (RDI 30) increased from 15% in premenopausal to 34% in postmenopausal women. In contrast, prevalence was essentially identical (36% and 40%) in the corresponding age groups of men. Total cholesterol, triglycerides, LDL-cholesterol, PaCO2 and HCO3 all increased steeper with age in women than in men. BMI and diastolic blood pressure were unchanged, while systolic blood pressure increased more in women (133±18.9 and 160±29.0 mmHg, p<0.01) than in men (143±21.5 and 150±20.2 mmHg, p<0.03). Severity of sleep apnea (RDI) correlated with PaCO2, HCO3, BMI and blood pressures in post- but not in premenopausal women.

Conclusions
Menopausal transition was associated with an emergence of cardiovascular risk factors including elevated systolic blood pressure and an unfavorable lipid profile. Decreased CO2 chemosensitivity may be a mechanism behind the increased prevalence of severe OSA after menopause. The negative impact of OSA on cardiovascular morbidity may be promoted by risk factors appearing during the menopausal period.

Abstract
12

13. Effects on blood pressure after treatment of obstructive sleep apnea with an oral appliance with mandibular advancement, a 3 year follow-up.

Ann Andrén and Åke Tegelberg
Department of Stomatognathic Physiology, Central Hospital, SE-721 89 Västerås, Sweden
E-mail: ann.andren@ltv.se
E-mail: ann.andren@bredband.net

The aim of the study was to investigate if reduction of obstructive sleep apnea (OSA) with oral appliance treatment (OA) affects the blood pressure (BP) in 3 months and 3 years perspective. Twenty-nine consecutive patients with verified OSA; defined as AI > 5 and/or AHI>10/hours, received an OA as treatment. The BP was measured at 3 study visits; before treatment, after 3 months and after 3 yrs, respectively. The BP was measured twice with an automatic unit and the second value was registered as the BP of the visit. The treatment effect of OA was measured after 3 months use by a repeated somnographic registration wearing the OA. Treatment response was defined as AHI<10 and this was achieved in 25 of 29 patients after 3 months. At the 3 years follow-up 22 patients remained and they had received a significant reduction of the systolic BP of -15.4mm Hg and the diastolic BP of -10.3mm Hg. This significance was received between baseline and the 3 months evaluation ($p<0.001$), and remained at the 3 years follow-up.

In conclusion, OA treatment reduced blood pressure in both 3 months and 3 years perspectives in patients with OSA .

Any author of the paper has a conflict of interest related with the work.

Abstract

13

14. UPPP is an alternative to your OSAS patients who have failed conservative treatment

Lundkvist K[1], Januszkiewicz A[2] and Friberg D[1]
Departments of Otorhinolaryngology[1,] and Anaesthesiology[2], Karolinska University Hospital, Huddinge, Stockholm, Sweden, Clintec, Karolinska Institute

Corresponding author: Karin Lundkvist, karin.lundkvist@karolinska.se

Objectives
To evaluate uvulopalatopharyngoplasty (UPPP) in sleep apnoea patients failing or not accepting CPAP and Mandibular Retaining Device (MRD).

Design
Nonrandomised prospective intervention study

Material and Methods
158 patients, 139 men and 19 women, median age 45 years, (range 20-75), median Body Mass Index (BMI) 29 (20-48), with OSAS, treated with UPPP. Sleep apnoea recordings and questionnaires including Epworth sleepiness scale (ESS) before and one year after surgery.

Results
120 patients underwent sleep apnoea recordings, which showed a significant decrease in oxygen desaturation index (ODI), from median 23 (6-100) to 8 (0-60). Using the criteria of success (ODI <20 and >50 % reduction), 64 % were responders. 120 patients evaluating their sleepiness showed a significant decrease in ESS value from median12 (0-21) to 6 (0-22). Out of 158 patients, 7 (4,4 %) had a mild degree of postoperative complications and 3 (1,9%) had a more severe degree. There were no deaths, nor sequel of complications. Eighty-eight percent of the patients were satisfied with their operation. Laboratory success factors were female gender, low age and low preoperative ODI, but not large tonsils or low BMI.

Conclusions
OSAS patients failing CPAP and MRD should be offered UPPP.

No conflicts of interest

Abstract
14

15. Radiofrequency uvulopalatoplasty with a single suture

Fikret CINAR*, M.D; M.Birol UGUR,M.D; Ebru TAS**,M.D**
*Associate Professor, Dept. of Otolaryngology-Head and Neck Surgery, Karaelmas University; Zonguldak / Turkey
**Assistant Professor, Dept. of Otolaryngology-Head and Neck Surgery, Karaelmas University; Zonguldak / Turkey

The objective of the study was to determine the effectiveness of a different radiofrequency uvulopalatoplasty (RFUP) technique : RFUP with a single suture in patients with mild obstructive sleep apnea (MOSA)

The goal of this new technique was to create a painless and comfortable postoperative period.

Sixty-two patients with uvula elongation identified as MOSA in the sleep disorders center by using polysomnography underwent RFUP. Thirty-two of the patients who underwent RFUP were randomly selected and a single suture applied to uvula.The mean respiratory distress index (RDI) were respectively 14,8 and 14.1 in the RFUP with and without suture groups. Postoperative visual analog score (VAS) for pain and difficulty in speech was significantly lower in RFUP with a single suture group compared to RFUP without suturing group ($p<0.005$) .After three months of the procedure, there was no significant difference between the two groups regarding the success rate (87% and 86.1%, respectively). Major complications did not occur in any of the patients.

In conclusion, RFUP with a single suture performed under local anesthesia is an easy, safe and confortable method.

Abstract

15

16. Metabolic status and nocturnal respiration is improved by weight reduction in obese Obstructive Sleep Apnoea Syndrome (OSAS) patients.

Pia Nerfeldt, Bengt Y Nilsson, Liliana Mayor, Stephan Rössner, Joanna Uddén and Danielle Friberg.
Karolinska Institutet at Karolinska University Hospital, Sweden.

Purpose
To evaluate the effect on metabolic status and nocturnal respiration by a dietary intervention program on obese OSAS patients.

Background
Approximately 70 % of OSAS patients are obese and they have an increased risk of cardiovascular diseases (CVD).

Study design
Prospective intervention study.

Material and method
Thirty-three obese OSAS patients at the Obesity unit were included for an 8 weeks long low calorie diet followed by behavioral modifying group therapy with a follow-up time of 6 months. Twenty-seven suffered from the metabolic syndrome.

Results
The dietary intervention showed a significant reduction of weight (mean 122 to 104 kg) and Apnoea-Hypopnoea-Index (46 to 26). In addition, metabolic parameters were significantly improved: systolic blood pressure (mean 144 to 134 mmHg), diastolic blood pressure (89 to 83 mmHg), fP-Glucos (7.1 to 6.3 mmol/L), fS-Insulin (133 to 76 pmol/L), LDL (3.9 to 3.0 mmol/L) and HDL (1.2 to 1.4 mmol/L). The numbers of prediabetics were reduced from 14 to 7.

Conclusion
Weight loss induced by low calorie diet and behaviour change support significantly improved metabolic status and respiratory parameters in obese OSAS patients after six months.

Practical implications
We recommend treating well motivated obese OSAS patients with weight reduction to reduce risk factors for CVD.

Conflicts of interest
None

Abstract
16

17. The effect of 12-month growth hormone treatment on obstructive sleep apnoea in abdominally obese men

Mahssa Karimi[2], Josef Koranyi[1], Celina Franco[1], Yüksel Peker[2,3], Derek Eder[2], Jan-Erik Angelhed[4], Lars Lönn[5], Ludger Grote[2], Bengt-Åke Bengtsson[1], Johan Svensson[1], Gudmundur Johannsson[1] and Jan Hedner[2].

[1]Centre for Endocrinology and Metabolism, Sahlgrenska University Hospital, Göteborg, Sweden
[2]Sleep Disorders Center, Sahlgrenska University Hospital, Göteborg, Sweden
[3]Sleep Medicine Unit, Department of Neurorehabilitation, Skaraborg Hospital, Skövde
[4]Center for Clinical Trials, Institute of Medicine, Sahlgrenska University Hospital, Göteborg, Sweden
[5]Department of Radiology, and Endovascular Surgery, Rigshospitalet, Faculty of Health Sciences, Copenhagen, Denmark.

Background
Obstructive sleep apnea (OSA) is associated with a state of relative hyposomatotropism. Risk factors are male, obesity, and soft tissue abnormalities in the neck. This study aimed to investigate the effect of human Growth Hormone (GH) treatment on OSA indices in abdominally obese men.

Patients and Methods
Thirty-seven men with abdominal obesity and glucose intolerance, were randomized in a prospective 12-month, double-blind placebo controlled trial to either GH (n=18, mean (SD) age: 61(7.1) years) or placebo (n=19, 64(6.1) years). Groups were stratified regarding Body Mass Index and waist circumference. Overnight ambulatory polysomnography and computerized tomography (CT) for assessment of muscle and fat distribution in the neck were performed at baseline and after 12 months.

Results
In contrast to placebo, GH treatment was associated with a worsening from baseline to follow-up of all OSA indices; Apnoea/Hypopnea Index (AHI) (n/h) 31(20) vs. 43(25) (p=0.003), Oxygen Desaturation Index (ODI) (n/h) 18(14) vs. 29(21) (p=0.008), NREM-AHI 29.4(19.7) vs. 41(26.9) (p=0.003). GH treatment was also associated with increases in serum Insulin-like-Growth-Factor-1 (IGF-1) (168(71.8) to 292(116.8), p= 0.0001), total neck area (172(20.5) to 179(19.6), p= 0.02) and neck circumference (47(2.6) to 48(2.6), p=0.01).

Conclusions
GH treatment increased the severity of OSA in men with abdominal obesity. The parallel changes in neck circumference and AHI after GH treatment possibly suggest that exacerbation of OSA may be related to trophic effects in the neck.

Abstract
17

18. An European multi-centre long-term observational cohort (ESADA – European Sleep Apnea DAtabase) within the frame of COST action B26

Jan Hedner, Ludger Grote, Ann-Christin Lundquist, Jeanette Norum
Sleep Disorders Center, Sahlgrenska University Hospital, Gothenburg, Sweden

The project aims to generate a multinational European database containing medical information on patients suspected of OSA referred to sleep centers. Enrolment is consecutive and includes essentially all untreated patients independently of comorbidity, concomitant medication and degree of sleepiness. A web-based data collection format has been constructed for transfer of clinical data to a central database located and coordinated at Gothenburg University. A joint scientific committee including representatives of the different participating centers decides on the use and exploitation of data. The basic dataset (base cohort) will be used for a series of projects related to outcome research, clinical process evaluation as well as dissemination of standards for diagnosis and treatment of OSA. A subsequent step includes sub protocols dealing with pathophysiology, genetic mechanisms, neurocognitive impairment and cardiovascular disease in OSA.

The core of the ESADA has been started from the European Union COST action network of nationally appointed sleep apnea experts. To date there are 22 participating centers across Europe and in the excess of 720 patients have been enrolled. Monthly inclusion rate is approximately 100 patients. In some countries national patient registries are used for data generation within the ESADA network. The first cross sectional analysis is planned at approximately 3000 patients. Providing the planned recruitment goals are met, the ESADA may constitute one of the world's largest prospective cohorts including up to 7,000 patients with sleep disordered breathing. Beside the scientific opportunities offered, the action will generate possibilities to achieve local and cross national standardization, improvement of quality of care as well as increased scientific and clinical exchange of ideas between different European sleep centers.

Abstract
18

19. Clinical characteristics in hypertensive patients with or without risk of OSA – Preliminary data from the HYPERSLEEP study group

Anna Ståhlkrantz[a], Jan Albers[a], Jan Wiberg[a], Fredrik Nyström[bc], Ola Sunnergren[e], Martin Ulander[df], Eva Svanborg[df] ,Anders Broström* [be]

[a]Department of Pulmonary Medicine, County Hospital Ryhov, Jönköping, Sweden.
[b]Department of Medicine and Health Sciences, Linköping University, Linköping, Sweden.
[c]Department of Internal Medicine University Hospital Linköping, Sweden.
[d]Department of Clinical Neurophysiology, University Hospital Linköping, Sweden.
[e]Department of Ear Nose and Throat, County Hospital Ryhov, Jönköping, Sweden
[f]Department of Neuroscience and Locomotion, Faculty of Health Sciences Linköping University, Linköping, Sweden.

* Communication: Anders Broström, Department of Clinical Neurophysiology, University Hospital, S-581 85 Linköping, Sweden.
Tel. +46-13-222534 Fax. +46-13-224541. E-mail: andbr@imv.liu.se

Purpose
To describe the prevalence of patients who suffers high risk of OSA at a HT-clinic, as well as to compare how clinical characteristics, self rated sleep and excessive daytime sleepiness (EDS) differs in HT-patients with or without high risk of OSA.

Methods
A total of 95 consecutive patients (40% men) with HT were enrolled from a GP. Data regarding risk of OSA, insomnia, EDS and clinical characteristics were collected.

Results
76% of the included patients met the Berlin sleep apnoea questionnaires criteria. Patients with high risk of OSA reported higher prevalence of loud and frequent snoring, more complaints from others regarding snoring, more witnessed apnoeas, and higher frequency of non restorative sleep compared to patients without high risk of OSA. No significant differences were found regarding systolic or diastolic blood pressure, total sleep time, EDS, BMI, neck circumference, waist hip ratio, levels of body fat, lipid-, creatinin-, or blood glucose levels between the groups.

Conclusion
This study indicates that above 70% of all patients with HT at a GP might have high risk of OSA. Knowledge of how clinical characteristics differs between patients with or without high risk for OSA can help GP:s to identify patients at risk.

Key words
Hypertension, obstructive sleep apnoea, snoring, insomnia

Abstract
19

20. Prediction of cardiovascular risk by overnight recordings of autonomic signals in patients with suspected sleep disorders

Ludger Grote[1], Jan Hedner[1], Dirk Sommermeyer[2], Ding Zou[1], Derek Eder[1]
[1] Sleep Disorders Center, Sahlgrenska University Hospital, Gothenburg, Sweden
[2] Measure Check Control, Karlsruhe, Germany

Introduction
Sleep Disordered Breathing (SDB) is frequently but not uniformly associated with cardiovascular disease. Therefore, identification of patients at risk is of crucial importance. This study applied a new algorithm for overnight pulse rate and pulse wave analysis in order to detect associations with a well established cardiovascular (CV) risk matrix.

Methods
A sleep clinic cohort of 150 patients was investigated by overnight polygraphic recordings. Pulse rate and finger pulse wave form were recorded using a newly developed photoplethysmographic device. The composite autonomic variability index (ASIC) was calculated and correlated with the risk factor matrix determined from a detailed CV history, blood pressure assessment, and standard medical care information. 100 randomly selected patients were used as a training set of the algorithm. A second set of 50 patients constituted the validation population.

Results
In the training set, 84 patients were at low risk and 16 patients at high risk according to the CV risk matrix. Among low risk patients 69 (82.1%) of were correctly classified and 15 (17.9 %) were misclassified. In the 16 patients with high CV risk, 12 (75%) were correctly assigned and 4 patients (25%) were not detected as high risk patients by ASIC. In the validation set, 32 (80%) and 8 (20%) low risk patients were correctly and incorrectly assigned, respectively. 7 out of 10 patients with high CV risk were correctly identified. Misclassification was mainly associated with concomitant beta-blockade.

Conclusion
This novel algorithm derived from modified overnight oximetry data may be helpful to detect patients with co-morbid CV- or at increased risk for incident CV- disease. Prospective studies in specific risk populations are necessary to further validate and improve this method.

Abstract
20

21. Nocturnal pulse wave attenuation is associated with daytime blood pressure in a population based cohort

Ding Zou [a], Ludger Grote [a], Jakub Radlinski [a,b], Derek N. Eder [a], Ulf Lindblad [c,d], Jan Hedner [a]
[a]Sleep Disorders Center, Sahlgrenska University Hospital, Gothenburg, Sweden
[b]Department of Pathophysiology of Respiratory System, Institute for Tuberculosis and Lung Diseases Rabka-Zdrój Branch, Rabka-Zdrój, Poland
[c]Skaraborg Institute, Skövde, Sweden;
[d]Department of Community Medicine, Lund University, Malmö, Sweden

Objective and Background
Pulse wave amplitude (PWA) derived from the digital vascular bed has been used in sleep studies. We assessed the relationship between nocturnal PWA attenuation and daytime blood pressure (BP).

Methods
81 subjects (46 men; age 60±7 yrs; body mass index [BMI] 28.2±4.3 kg/m2; apnea hypopnea index [AHI], 25.4±22.6 events/h; systolic BP 137±15 mmHg; diastolic BP 79±7 mmHg) recruited from a population based cohort underwent simultaneous ambulatory polysomnography (PSG) and peripheral arterial tonometry (PAT) recording. Episodic attenuations of PWA derived from the pulse waveform of PAT signal were identified and characterized. Generalized least squares regression model was used to identify the association between PSG indexes, PWA attenuation (PWA.att) and the daytime BP.

Results
We found PWA.att, oxygen desaturation index (ODI), and AHI, but not arousal index predicted daytime BP. Systolic/diastolic BP was predicted by PWA.att (P=0.02 / P=0.005), oxygen desaturation index (ODI) (P=0.03 / P= 0.03), AHI (P=0.03 / P=0.11). The association between PWA.att and daytime BP was independent of gender, age, AHI, ODI and use of antihypertensive medication, but proportional to BMI (systolic/diastolic BP P=0.004 / P=0.01). However, there was no direct interaction between the effects of PWA.att and BMI.

Conclusions
Overnight magnitude of PWA attenuation, presumably reflecting nocturnal sympathetic reactivity, was associated with daytime BP. This measure of autonomic tone in sleep may provide novel insights into cardiovascular risk classification.

Abstract
21

22. High prevalence of obstructive sleep apnoea in revascularized patients with coronary artery disease - RICCADSA trial

Helena Glantz[1], Erik Thunström[1] Anders Kallryd[1], Jan Ejdebäck[1], Johan Herlitz[2], Yüksel Peker[1]
[1]Sleep Medicine Unit and Dept of Internal Medicine and Cardiology, Skaraborg Hospital, Skövde and Lidköping
[2]Dept of Cardiology, Sahlgrenska University Hospital, Gothenburg, Sweden

One third of the patients with coronary artery disease (CAD) have been suggested to suffer from obstructive sleep apnoea (OSA) compared with 13% of healthy controls matched by age, gender and Body-Mass-Index. The current study (RICCADSA) is an on-going randomized controlled trial addressing the impact of continuous positive airway pressure (CPAP) in revascularized CAD patients and concomitant OSA (Apnoea-Hypopnoea-Index [AHI]≥15/h) without daytime sleepiness (Epworth Sleepiness Scale [ESS] <10). The primary end-point is the combined rate of new revascularization, myocardial infarction, stroke and cardiovascular mortality over a 3-year period. The trial was started December 1, 2005 to comprise 400 participants including 200 non-sleepy OSA patients (randomized to CPAP or non-CPAP), 100 sleepy (ESS≥10) OSA patients on CPAP and 100 non-OSA subjects (AHI<5/h). Patients with dominantly Cheyne-Stokes respiration and/or with AHI 5.0-14.9 (borderline OSA) are not included in the trial. Out of 560 revascularized CAD patients, 286 (51.1 %) agreed to participate in the study by January 31, 2008. OSA was prevalent in 176 (61.6%), of whom 108 (61.4%) were regarded as non-sleepy. Borderline OSA was observed in 51 (17.8%) whereas 59 (20.6%) had no OSA. We conclude that more than half of the revascularized CAD patients have OSA, which is much higher than previously reported. When completed, the current trial will contribute to define the impact of CPAP as a non-pharmacological intervention for CAD patients with OSA regardless daytime sleepiness.

Supported by the Swedish Heart-Lung-Foundation, Research fund at Skaraborg Hospital, Heart Foundation of Kaernsjukhuset, and ResMed Ltd.

Abstract
22

23. The Side Effects to CPAP treatment Inventory (SECI): validity and reliability of the first self assessment inventory of side-effects to CPAP treatment

Anders Broström*[ab], Kristofer Franzen[c], Anna Strömberg[ad], Anna Ståhlkrantz[e], Jan Albers[e], Martin Ulander[bf], Eva Svanborg[bf]
[a]Department of Medicine and Health Sciences, Faculty of Health Sciences Linköping University, Linköping, Sweden.
[b]Division of Clinical Neurophysiology, Linköping University Hospital, Linköping, Sweden
[c]School of Nursing. Kalmar, Sweden
[d]Department of Cardiology, Linköping University Hospital, Linköping, Sweden
[e]Department of Internal Medicine, County Hospital Ryhov, Jonkoping, Sweden.
[f]Institution of experimental and clinical medicine, Faculty of Health Sciences Linköping University, Linköping, Sweden.

*Communication: Anders Broström, Department of Neurophysiology, University Hospital, S-581 85 Linköping, Sweden.
Tel. +46-13-222534, email: andbr@imv.liu.se

Purpose
To investigate the validity and reliability of the Side Effects to CPAP-treatment Inventory (SECI).

Sample
A cross-sectional design was used. 350 OSAS patients (60% men) with a mean use of CPAP treatment for 55.9 months (2 weeks-182 months) were included.

Instrument
SECI includes 15 side effects. Each side effect includes 3 dimensions; frequency and magnitude of the side effects and decrease of CPAP use, in total 45 items. Each item should be answered on a five-point Likert type scale.

Results
Content validity was tested with good results through an expert group. The item analysis demonstrated good item-total correlations in the magnitude and adherence scales. Only one item demonstrated a correlation <0.3. The item-total correlations were generally weaker in the Frequency scale with three items <0.3. In the factor analysis two factors emerged. The first factor described symptoms, and the second described device related side effects. The Cronbach´s of the three scales were adequate (0.75-0.83). The reliability was adequate for the subscales (0.72-0.86), except for the frequency subscales (0.62-0.67).

Conclusion
The high values of reliability and validity of this new instrument are promising and indicates that SECI can be used to measure side effects to CPAP-treatment in OSAS-patients.

Key words
Obstructive sleep apnoea syndrome, continuous positive airway pressure, side effects, assessment tool, validity, reliability

Abstract
23

24. High prevalence of Type D personality among CPAP users and correlation to perceived side effects and adherence

Martin Ulander[1], Anna Strömberg[2,3], Jan Mårtensson[4,5], Lena Harder[1,6], Eva Svanborg[1,6], Anders Broström[1,2]
[1]Department of Clinical Neurophysiology, University Hospital, Linköping, Sweden
[2]Department of Medicine and Health Sciences, Linköping University, Linköping, Sweden
[3]Department of Cardiology, Linköping University Hospital, Linköping, Sweden
[4]Unit of Research and Development in Primary Care, Qulturum, Jönköping, Sweden
[5]Department of Nursing Science, School of Health Sciences, Jönköping, Sweden
[6]Department of Neuroscience and Locomotion, Faculty of Health Sciences, Linköping University, Linköping, Sweden

*Communication: Anders Broström, Department of Neurophysiology, University Hospital, S-581 85 Linköping, Sweden.
Tel. +46-13-222534, email: andbr@imv.liu.se

Purpose
To describe the prevalence of Type D personality in OSAS patients with CPAP treatment longer than 6-months and the association to self-reported side effects and adherence.

Theoretical framework
CPAP is the treatment of choice for OSAS, but side effects are common and long-term adherence low. The Type D personality is defined as a combination of negative affectivity and social inhibition.

Methods
A cross-sectional design was used. 247 patients with a mean use of CPAP treatment for 55 months (6-182 months) were included. Data collection was achieved by two questionnaires; DS-14 (Type D personality), SECI (side effects of CPAP), as well as from medical records.

Results
Type D personality occurred in 30 % of the patients with OSAS and significantly ($p<0.05$-$p<0.001$) increased the perceived frequency and severity of a broad range of side effects. The objective adherence was significantly lower ($p<0.001$) for OSAS patients with Type D compared to patients without Type D, both with regard to a mean use of 4 hours/night.

Conclusion
The additional effect of a Type D personality on perceived side effects and adherence to CPAP treatment found in this study could be used by health care personnel when evaluating patients waiting for treatment.

Key words
Obstructive sleep apnoea syndrome, Type D personality, continuous positive airway pressure, adherence, nursing

Abstract
24

25. How can we use Problem Based Learning (PBL) in an educational program when initiating CPAP treatment in patients with OSAS?

Anders Broström* [1,2] , Anna Ståhlkrantz [3], Jan Albers[3], Jan Wiberg[3], Martin Ulander[2,4], Per Nilsen[5], Eva Svanborg[2,4]
[1]Department of Medicine and Health Sciences, Faculty of Health Sciences Linköping University, Linköping, Sweden
[2]Department of Clinical Neurophysiology, Linköping University Hospital, Linköping, Sweden
[3]Department of Internal Medicine, County Hospital Ryhov, Jonkoping, Sweden
[4]Department of Neuroscience and Locomotion, Faculty of Health Sciences Linköping University, Linköping, Sweden
[5]Division of Social Medicine and Public Health Science, Department of Health and Society, Linköping University, Linköping, Sweden

*Communication: Anders Broström, Department of Neurophysiology, University Hospital, S-581 85 Linköping, Sweden.
Tel. +46-13-222534, email: andbr@imv.liu.se

Purpose
To describe the content of a nursing based educational program for CPAP initiation in patients with OSAS.

Theoretical framework
Problem-based learning (PBL) has been used in a few patient education studies. Self studies and tutorial groups based on the problem-solving process are central. An integration of different areas of knowledge can be used. Motivation can be seen as an important factor for adherence. 6 internal determinants for treatment motivation have been described; problem recognition, level of suffering, external pressure, perceived cost of treatment, perceived suitability of treatment, and outcome expectancy. Self-determination theory has also been used to develop an educational program for CPAP users.

Result
The program is based on tutorial groups consisting of 4 patients and 4 spouses. Six one hour sessions are included. The themes for the different sessions are; 1) What is OSAS?, 2) How can I use CPAP?/Benefits of CPAP treatment?, 3) Practical training with device and CPAP mask, 4) How can I conquer problems and side effects?, 5) Nutritional aspects, 6) Physical activity.

Conclusion
We describe a tutorial concept based on PBL. Patients are included in small tutorial groups in this educational program. Its efficiency will be tested in a large prospective randomized trial.

Key words
Obstructive sleep apnoea syndrome, continuous positive airway pressure, educational program, spouse

Abstract
25

26. Acceptance for the use of Auto-CPAP among Patients with Upper Airway Resistance Syndrome

Friberg D[1], Myrin S[2], Lind-Härmä M[2], and Aoki F[2]
[1]Departments of Otorhinolaryngology1, and
[2]Neurophysiology, Karolinska Institutet, Karolinska University Hospital, , Huddinge, Stockholm, Sweden,

Corresponding author: danielle.friberg@karolinska.se

Objectives
To evaluate the acceptance for AutoCPAP among patients with upper airway resistance syndrome (UARS).
Inclusion criteria: Habitual snoring, Apnoea-Hypopnea index (AHI) total <5 and supine <10, Epworth sleepiness scale (ESS) >10, signs of upper airway resistance during inspiration and sleep.

Material
Seventeen patients were recruited, nine men, median age 45 years (range 40-65), median BMI of 24 (23-26), median ESS score of 15 (13-23) and eight women, 55 years (39-68), BMI 28,5 (22-31), ESS score of 16 (11-19). Thirteen patients had undergone polysomnography and four patients sleep apnoea recordings. None exhibited tonsil hypertrophy and nasal congestion was treated with nasal steroid.

Results
Nine out of 17 patients (53 %), 5 men and 4 women accepted Auto-CPAP. Six of them used it regularly, whereas 3 (2 women and 1 man) used it occasionally. Seven of 17 patients reduced their ESS score from median 15,5 (14-21) to 7,5 (5-19) with Auto-CPAP. Seven (5 women and 2 men) wanted a mandibular retaining device (MRD) instead, but were unwilling to pay 750 Euro for it.

Conclusions
The acceptance of Auto-CPAP is relatively poor among UARS-patients. Other treatment alternatives to sleepy non-apnoeic snorers are needed. MRD should be cost-reduced and evaluated for these patients.

None of the authors have any conflicts of interest

Abstract
26

27. Comparison of three different methods for delivery of CPAP therapy

Paija Ulrika, Nilisse Susanna, Wallander Maria, Hedner Jan and Grote Ludger
Sleep Disorders Center, Sahlgrenska University Hospital, Gothenburg, Sweden

Background
Traditionally, CPAP treatment is initiated by individual establishment of pressure in the sleep laboratory followed by an individual daytime visit in the clinic. In this evaluation we aimed to quantify treatment efficacy and adherence to treatment after three different modes of CPAP initiation.

Method
CPAP therapy was initiated in three different manners; (A) CPAP titrated after a nightly recording at the sleep laboratory (n=56), (B) Autotitrated CPAP prescribed during an individual daytime visit (n=50) or (C) A procedure identical to (B) but within a group visit of 8 individuals (n=90). Allocation was non-randomized and reflected clinical procedures applied in the sleep laboratory. Follow-up was variable within 60 days according to clinical routines.

Results
The mean CPAP usage during the first month was 3.6, 3.3 and 2,2 hours/night in group (A), (B) and (C), respectively. The rejection rate of CPAP during the first 60 days was 7, 18 and 10% in the three groups. However, limited data at 180 days suggested a rejection rate in the order of 25-30% in groups (B) and (C). The corresponding number in group (A) was 11%. In contrast, the estimated immediate labour input (work hours) per patient prescribed CPAP was approximately 40% lower in group (B) compared with group (A) and additionally 20% lower in group (C).

Conclusion
Simplified methods for CPAP prescription were time saving and increased patient turn-over in the sleep clinic. However, rejection rate increased in proportion to simplification of procedures. Part of the apparent time savings may be spent on more complex follow-up procedures and a lower proportion of patients end up on adequate CPAP therapy. It is possible that optimized methods for patient stratification may lead to better cost/effectiveness in long-term CPAP treatment.

Abstract
27