

Physical Activity Review

December 1999

No. 1

ISPAPOFF

ISPAPOFF
was
officially
launched
at the
International
Congress
of
Osteoporosis,
in
Xian, China
2 April 1999

A
multi-
disciplinary
Scientific
Society
endeavouring
to encourage
further
Research
in the field
of
Osteoporosis
Falls &
Fractures”

The Official Newsletter of the International Society of Physical Activity for the Prevention of Osteoporosis

A group of researchers and clinicians with an interest in physical activity gathered on 1st April 1999 during the Third International Congress on Osteoporosis held in Xian, China. The resulting Society - *The International Society of Physical Activity for the Prevention of Falls and Fractures (PAPOFF)* was officially launched at the same Congress on 2nd April 1999. The Following statement from the Society was issued at the launch. “The aim of the Society is

“The aim of the Society is to encourage physical activity at all ages of life”

to encourage physical activity at all ages of life, particularly with a view to improving tone, strength, muscle function and postural stability, and with the ultimate goals of reducing the risks of falls and fractures. This is a multi-disciplinary scientific society which will endeavour to encourage further research in the field and to promote education to the public and healthcare professions.”

Dr Ole Simonsen, Orthopaedic Surgeon from



**DR OLE SIMONSEN
ORTHOPAEDIC SURGEON
HJOERRING DENMARK**

Hjoerring, Denmark, who has a special interest in physical activity and exercises was elected the First President of the Society. He states, “I am delighted that since the initial meeting in China many more people have already shown great interest in the Society. I hope that people with an interest in the field of physical activity and exercise from different backgrounds will contribute to the Society and make it a success. I hope that members will start networking with one another and that the Society will develop close links with other organisations with common interests.”

Table of Contents:

| | |
|--|---|
| Introduction | 1 |
| Selected Publications | 2 |
| Report from the American Society for Bone & Mineral Research Meeting | 3 |
| Forthcoming Events | 4 |

SELECTED PUBLICATIONS:

Osteoporotic Fracture among older U.S. Women: Risk factors quantified

L.W. Turner, Q. Fu, J. E. Taylor, M.Q. Wang
J Aging Health 1998; **10**:372-391

The purpose of this study was to develop a predictive model for osteoporotic fracture among a national sample of 2,325 women aged 50 years and older. Factors examined included age, race, heredity, body mass index, physical activity, smoking status, alcohol use and dairy product use. Strong risk factors predicting osteoporotic fracture included age, race, low body mass index and inactivity. This study promotes achieving and maintaining healthy body weights for underweight women and performing moderate physical activity.

Good maintenance of high-impact activity-induced bone gain by voluntary, unsupervised exercises: An 8 month follow-up of a randomized controlled trial.

A. Heinonen, P. Kannus, H. Sievanen, et al.
Journal of Bone Miner. Res. 1999; **14**: 125-128

This follow-up Finnish Study shows that the significant BMD increases that were obtained by supervised 18 month high impact training in menopausal women (n=39) in the original study were maintained with subsequent unsupervised regular aerobic and step classes (twice per week) (n=30). The results show the effectiveness and feasibility of self-controlled aerobic and step exercises in the primary prevention of osteoporosis amongst healthy pre-menopausal women.

Brisk Walking and Postural Stability: A cross-sectional study of Postmenopausal Women

K. Brookek-Wavell, L. E. Athersmith, P. R. M. Jones, T Masud.
Gerontology 1998; **44**: 288-292

This study compared body sway, a measure of postural stability, between regular brisk walking (n=16) and control (n=15) women aged 61 – 71 years, recruited from a randomized controlled study of the influence of brisk walking on bone. Body sway (eyes closed, standing on a compliant surface) was lower in walkers than in controls (p<0.05). A negative correlation was found between body sway and minutes of physical activity (r=-0.47, p<0.01). Analysis of variance revealed that body sway differed significantly between groups of differing physical activity participation. These data suggest that postural stability is better in regular walkers than in control subject. Furthermore, a dose-response relationship was observed between physical activity and postural stability in post-menopausal women.

Professorial football (soccer) players have markedly greater skeletal mineral content, density and size than age – and – BMI – matched controls.

A. Wittich, C.A. Mautalen, M. B. Oliveri et al
Calcif Tissue Int. 1998; **63**:112-117

Total Skeleton Bone Mineral Content was 18% (p<0.001) greater in a group of professional Argentinian male 1st division soccer players (n=24) compared to controls (n=22). The difference resulted from the sum of 5.2% (p<0.02) increment of bone size and 12.3% (p<0.001) increment of Bone Mineral Density. The analysis of skeletal sub-areas revealed that the difference of the BMC and BMD was greater at the level of the pelvis and legs compared with the arms or trunk. The BMC and BMD of the head were equal for both groups. Also the bone size of the legs and pelvis was significantly greater for the soccer players compared with controls, whereas there was no difference at the level of the arms or head. Within the group of football players the increment of total skeleton BMD was smaller in the young players, with less than 7 years of practice compared with players with more than 7 years practice.

Functional impact of unvarying exercise Programme in women after menopause

K. Kerschan, Y. Alacamlioglu, J. Kollmitzer et al
Am. J. Phys. Med. Rehabil. 1998; **77**:326-332

In this Austrian study 124 women aged 68.3±6-8 years who had been stratified into exercise or control groups 5 to 10 years earlier were recalled and reassessed. Self-chosen gait velocity was slightly higher in the regular exercises than in controls. No intergroup differences were found for pain induced disability, muscle strength, body sway and fracture rate. The results suggested that the unvarying home-based exercise programme used in the study may support general agility but does not yield enough force to improve muscle strength and postural stability in healthy, non-disabled, post-menopausal women who start exercising at the age of 60 years. Interestingly after 7.7±1.1 years the compliance of the training group was 36%.

Physical activity and osteoporotic fracture risk in older women

E. W. Gregg, J. A. Cauley, D. G. Seeley et al
Annals of Internal Medicine 1998; **129**: 81-88

More than 9000 American women aged 65 years and over were followed up for an average of almost 8 years. Higher levels of leisure time, sporting activity and household chores were associated with a significant reduction in the risk of hip (but not wrist) fractures, after adjustments for age, dietary factors, falls at baseline and functional and health status. Very active women (4th and 5th quintiles) had a statistically 36%

reduction in hip fractures (RR 0.64, 95% CI 0.45-0.89) compared with the least active women (lowest quintile). The intensity of physical activity was also related to fracture risk. Moderately to vigorously active women had statistically significant reductions of 42% and 33% in the risk for hip and vertebral fractures respectively compared to Inactive women

The Influence of physical activity and fractures on ultrasound parameters in elderly people.

W. C. Graafmans, L. M. Bouter, P. Lips
Osteoporosis International 1998; 8:449-454

In this cross-sectional Dutch study of 710 men and women aged 70 years and over, both ultrasound parameters (speed of sound and broad-band ultrasound attenuation) at the heel were positively associated with increased levels of physical activity. The latter was assessed by a questionnaire. Interestingly significant differences in both ultrasound parameters were observed between left and right heels

Longitudinal changes in selected physical capabilities: muscle strength, flexibility and body size

E. J. Basseley. In Physical Activity, Aging and Health: Perspectives from the Nottingham Longitudinal Study. Ed. K. Morgan
Age and Ageing 1998; 27(suppl.3):12-16

In a group of 350 survivors of a random U.K. sample originally aged 65 years and over collected at least 8 years previously, there were significant independent associations between the loss of muscle strength in old age and both decline in physical activity and increase in depression scores. The results were strongly suggestive of causal links and provide further evidence for the need to encourage physical activity in order to maintain strength and function in old age.

Randomized controlled trial of a general practice Programme of home based exercise to prevent falls in elderly women

A. J. Campbell, M. C. Robertson, M. M. Gardner et al
BMJ 1997; 315:1065-1069

This New Zealand study evaluated an individually tailored programme of physical therapy in the home (n=116) in comparison to usual care and equal number of social visit (n=117), in women aged 80 years and older living in the community. The mean rate of falls was lower in the exercise than the control group [0.87 (1.29) v 1.34 (1.93) falls per year respectively; difference 0.47 (95%CI 0.04-0.90)]. After 6 months, balance had also improved in the exercise group [difference between groups in change in balance score 0.43 (0.21-0.65)]

REPORT FROM THE 21ST ANNUAL MEETING OF THE AMERICAN SOCIETY FOR BONE & MINERAL RESEARCH (ST LOUIS SEPT 30TH – OCT 4TH 1999)

Thirty-five oral and poster presentations on the subject of exercise and physical activity were presented at this Society:

A Swedish cross-sectional study (M. K. Karlsson et al) on active and retired soccer players (aged 19 – 85) suggested that the higher peak BMD attained by vigorous physical activity during growth is not retained after retirement and in old age. Fracture rates were not reduced in retired soccer players. The results suggested that exercise in men during growth was unlikely to result in lower fracture risk in old age. However, some potential confounders such as development of arthritic joints in soccer players were not controlled for.

A study in Finnish early post-menopausal women (n=80) showed a significant additive effect of impact-type exercise (2 days a week supervised and one hour a day at home 4 days a week) to oestrogen therapy on BMD at one year in weight bearing bones (D. R. Suominen et al).

Regular Training of three different types (1.weight training, 2. mild endurance training, 3.balance and co-ordination training) all prevented bone loss, functional incapacity and immobility and reduced back pain as well as increase quality of life in 130 German osteoporotic post-menopausal women with back pain when compared to controls. (P. Donhauser et al).

Iwamoto et al (Japan) investigated the influence of physical activity on bone resorption (Urinary NTx by ELISA) in 70 hemiplegic male patients and 72 controls and found that bone resorption was significantly influenced by general activities of daily living in both groups. The baseline bone resorption was significantly higher in the hemiplegic group compared to controls

Another Japanese study surprisingly showed that a 2 year swimming exercise programme in post-menopausal women retarded bone loss on the proximal femur (but not spine) and increased leg extensor power. (J. Wu et al)

Four abstracts from a study from Texas of a 15 week fall prevention exercise programme in women aged 65-89 years (J. E. Ballard) showed that the programme improved leg strength (R. Roberts et al), balance (A. Hoffman et al) and led to desirable changes in body composition as measured by anthropometry, but not by DEXA (J. Sims et al). The older sub-group of women (73-89 years) benefited as much as the younger group (65-72 years) (P. Cusseau et al). The exercise programme consisted of: warm-up (10 minutes), low-impact aerobics with emphasis on lateral movement (25 minutes), leg strength and balance work (10 minutes), resistance – band exercise (10 minutes) and cool down (5 minutes).

A Belgian study of almost 2000 nursing home residents showed that assessment of non-skeletal risk factors (including postural hypotension, relevant medication, poor vision, low body weight, environmental hazards, difficulties in walking and transferring, poor co-ordination and muscle weakness) by staff was poor in most nursing homes. In those homes where correction of these risk factors was attempted, there was a significant reduction of hip fracture rates. (P. Geusens, Limberg, Belgium).

M. Sinaki (Mayo Clinic, Rochester, USA) followed a group of 50 older women for 10 years to determine the effect of physical activity on muscle strength and BMD. At the 10 year follow-up, the back extensor strength decreased to 73% of the initial strength. Surprisingly, the grip strength had increased significantly after 10 years. Average loss of BMD was 0.018g/cm² yearly. Evaluation of physical activity demonstrated a significant decrease in general physical activity but an increase in physical activities involving the upper extremities. Most subjects had continued with their daily routine physical activities and even added recreational activities such as knitting, gardening or crocheting which might explain the significant increase in grip strength. Most subjects had modified their participation in physical activities involving the lower extremities and truncal musculature such as caring for small children or jogging. This might explain the increased loss of muscle strength in the axial skeleton.

An interesting study of 134 long stay geriatric patients showed that better current mobility and muscle strength was associated with better bone structure (quantitative ultrasound at the heel). In addition, a beneficial effect of former exercise prior to age 40 on bone structure and risk of falling at and advanced age were demonstrated. (H. A. Bischoff, et al, Switzerland)

Newly developed vibrating platforms which can exert mechanical loading on the lower appenditure and axial skeleton and have the potential to reduce bone loss were discussed by H. W. Minne (Bad Pyrmont, Germany).

These and the other abstracts are published in The Journal of Bone and Mineral Research 1999; 14(Suppl.1)

FORTHCOMING EVENTS

1999

November 20-25, 6th International Symposium on Clinical Disorders of Bone and Mineral Metabolism *Formerly Henry Ford Symposium*, Venice, Italy. For more information, contact: Organizing Secretariat, Centro Italiano Congressi CIC, Corso Trieste, 42-00198 Roma, Italy. Tel: +39-06-8412673; Fax: +39-06-8412687; E-mail: congressi@gruppocic.it; Web-site: www.gruppocic.it/symposium/venice.htm

2000

April 10-14, 7th Bath Conference on Osteoporosis and Bone Mineral Measurement, Bath, UK. For more information, contact: Ms. Jane Williams, National Osteoporosis Society, PO Box 10, Radstock, Bath, UK BA3 3YB. Tel: +44-1-761-471-771; Fax: +44-1-761-471-104; E-mail: conferences@nos.org.uk, Web-site: www.nos.org.uk

May 6-10, 27th European Symposium on Calcified Tissues-ECTS 2000, Tampere, Finland. For more information, contact: CongCreator CC, Fax: +358-9-492-810; E-mail: secretariat@congcreator.com; Web-site: www.congcreator.com/calcified-tissues

May 8-12, 6th Annual Meeting of International Society for Clinical Densitometry and DXA Certification Course, Rio de Janeiro, Brazil. For more information, contact: ISCD Headquarters. Tel: 202-828-6056, Fax: 202-857-6056; E-mail: iscd@dc.sba.com; Web-site: www.iscd.org

2000

May 17-20, 4th International Symposium on Nutritional Aspects of Osteoporosis, Lausanne-Ouchy, Switzerland. For more information, contact: Madeleine Rueger, Secretary on the Board, CHUV Department of Internal Medicine, 1011 Lausanne, Switzerland.

May 18-21, 2nd International Workshop on Musculoskeletal Interactions, European Cultural Centre of Delphi, Greece. For more information, contact: Miss Maria Katsiri, International Society of Musculoskeletal and Neuronal Interactions (ISMNI), PO Box 51081, 145 10, Kifissia, Greece. Tel: +30-1-6231840; Fax: +30-1-8018122, E-mail: info@ismni.org, Web-site: www.ismni.org

June 15-18, World Congress on Osteoporosis 2000, sponsored by National Osteoporosis Foundation (NOF), Chicago, IL. For more information, contact: Kara Mulcahy. Tel: 1-202-223-2226; Fax: 1-202-223-2237; E-mail: wco2000@nof.org

September 7, The 1st Nottingham Conference on Falls and Postural Stability. For more information, contact: Ms. Jayne Mowson, The Post Graduate Education Centre, Nottingham City Hospital NHS Trust, Hucknall Road, Nottingham, UK NG5 1PB
Tel: 0044-115-9627758; Fax: 044-115-9627937; E-mail: tm@nchhce.demon.co.uk

September 22-26, 22nd Annual Meeting of the American Society for Bone and Mineral Research (ASBMR), Toronto, Ontario, Canada. For more information, contact: ASBMR.
Tel: 1-202-857-1161; Fax: 1-202-223-4579; E-mail: ASBMR@sba.com; Web-site: www.asbrm.org

November 30–December 2, International Conference on Progress in Bone and Mineral Research 2000 and Awarding of the “2000 International Research Prize,” Vienna, Austria. For more information, contact: Vienna Medical Academy, Alser Strasse 4, 0A-1090 Vienna, Austria.

December 2–5, Bone Ultrasonometry 4, 4th International Symposium for Clinical Practitioners, Florence, Italy. For more information, contact: ISCD Certification/Accreditation Office.
Tel: 1-360-694-5010; Fax: 1-360-694-5396; E-mail: certify@iscd.org; Web-site: www.iscd.org

December 7-9, 2nd International Meeting on Social and Economic Aspects of Osteoporosis and Bone Diseases, Liege, Belgium. For more information, contact: YP Communication. Tel: +32-4-254-1225; Fax: +32-4-254-1290; E-mail: ypc@compuserve.com

IS PAPOFF

President: **Dr Ole Simonsen** Orthopaedic Surgeon
Hjrring Hospital, Denmark.
E-mail: 2202@hjs.nja.dk

Secretariat: Ms Jayne Mowson Administrator

Vice President: **Prof. George Latsos** Orthopaedic Surgeon
Premedica Medical Centre. Thessaloniki, Greece
Fax: 30-31-824132

Post Graduate Education Centre
Nottingham City Hospital NHS Trust
Hucknall Road, Nottingham. NG5 1PB. United Kingdom
Tel: 0044 (0)115 9627758 Fax: 044 (0)115 9627937
Email: jmowson@ncht.org.uk

Secretary &
Newsletter
Editor: **Dr Tahir Masud** Consultant Physician
Nottingham City Hospital NHS Trust. UK
E-mail: tm@nchhce.demon.co.uk

For the Physical Activity Review (Newsletter of the Society) to be a success, it is important that articles, reviews, news from events or meetings/congresses, and any forthcoming relevant events or meetings are submitted regularly for inclusion. Members are also invited to submit short articles on their own departments and their relevant expertise in the field of activity, exercise, physical falls, fractures or osteoporosis. Photographs are also welcome.

**If you would like to become a member and to continue to receive the Newsletter.
Please let the Secretariat know. There is no Membership Fee at present as The Society Newsletter is being sponsored by
Pharmaceutical Companies.**