IOF Regionals
4th Asia-Pacific Osteoporosis Meeting
12 – 15 December 2013
Hong Kong

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Effect of Ethanolic Extract of Cinnamon on Calcium and Phosphorus Levels of Osteoporosis Rats

Zairin Noor, Nia Kania, Bambang Setiawan, Nicolaas C. Budhiparama

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ASSESSING AND MONITORING SERUM VITAMIN D LEVELS IN PATIENTS WITH VITAMIN D DEFICIENCY AT TERTIARY CARE HOSPITAL IN KARACHI, PAKISTAN
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Aims: Vitamin D (VD) deficiency is highly prevalent in Pakistani population. The aim is to evaluate the optimal dosing interval of VD replacement in Pakistani population.

Methods: A comparative prospective open label, randomized comparative study was conducted at Aga Khan University Hospital, Karachi. Adult patients of either gender with VD levels <20 ng/ml were recruited. The study participants were randomly assigned into 4 groups, with 25 patients in each group, for intervention to receive IM or oral VD in 200,000 or 600,000 units as per group allocation. Biochemical testing was performed at baseline, after 2 months and then at 6 months to monitor serum VD levels. VD dose was replaced in patients whose levels remained <20 ng/ml when monitored at follow-up. Vitamin D3 Intervention Groups: Group 1: 600,000 units IM; Group 2: 600,000 units oral; Group 3: 200,000 units IM; Group 4: 200,000 units oral.

Results: Of 100 participants recruited in the study, only 51 were finally included in the analysis at 6 months. Mean age and BMI of the study participants was 41.5 ± 14.3 years and 26.50 ± 5.51 mg/kg respectively. Mean baseline VD levels of group 1 and 2 patients were 8.86 ng/ml and 9.15 ng/ml, respectively; which significantly (p < 0.001) increased and become optimal after 2 months (mean VD levels 38.65 ng/ml and 30.00 ng/ml, respectively). Mean VD levels also significantly increased in patients treated with 200,000 units of vitamin D dose either IM or orally but did not reach optimum levels and remained below 30 ng/ml i.e. 25.12 ng/ml and 24.73 ng/ml for Group 3 and 4, respectively. Mean VD levels were significantly different between the four intervention groups after 2 months follow-up. However, decreased in VD levels were noted again when participants were monitored at 6 months follow-up in all the four groups.

Conclusions: Periodic monitoring and maintenance therapy is required to maintain optimum VD levels. Single dose of 600,000 units of VD intramuscularly once in 2 months is sufficient to achieve optimum VD levels. Large scale studies should be conducted to evaluate dosing interval and to establish an effective monitoring and treatment strategy to maintain optimum VD levels.

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EFFECT OF ETHANOLIC EXTRACT OF CINNAMON ON CALCIUM AND PHOSPHORUS LEVELS OF OSTEOPOROSIS RATS
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Aims: To investigate the effect of ethanolic extract of cinnamon in tibia calcium and phosphorus levels of ovariectomized rats.

Methods: A total of 30 Wistar female rats, were randomly divided into six groups including one control group, one ovariectomized group, and three ovariectomized groups who receiving ethanolic extract of cinnamon (EEC) at dose 12.5; 25; 50 mg/kg body weight. Cinnamon was obtained from traditional market in Malang, East Java. The cinnamon plant was identified by staff of herbarium, Department of Biology, School of Life Sciences and Technology, Bandung Institute of Technology, Bandung, West Java, Indonesia. The plant was identified as Cinnamomum burmannii Blume. The ovariectomy procedure was done in Pharmacology Laboratory, Medical Faculty, Brawijaya University of Malang. Tibia calcium and phosphorus levels were analyzed using X-Ray Fluorescence in Central and Physics Laboratory, Malang State of University, Malang, East Java, Indonesia. ANOVA test was used to analyze the different level of tibia mineral elements. This study was approved by Local Ethics Committee, Medical Faculty, University of Lambung Mangkurat, Banjarmasin.

Results: All doses of EEC able to normalize the level of calcium in osteoporosis rats. First dose of EEC normalizes the level of phosphorus in osteoporosis rats. First and third
doses of EEC normalize the level of calcium/phosphorus in osteoporosis rats.

**Conclusions:** The present study showed that low doses of EEC are the best to normalize calcium and phosphorus levels in osteoporosis rats.

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**AVULSION FRACTURES OF CALCANEUS IN ELDERLY PATIENTS: A 3-CASE REPORT**

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**Aims:** Avulsion fractures of calcaneus are relatively uncommon and are seen most frequently in elderly and osteoporotic patients. Surgical method that can avoid the displacement of the avulsion fragment after the fixation has been under development. We report 3 cases of this type of fracture treated with the open reduction and internal fixation (ORIF) using titanium wire and cannulated cancellous screw (CCS).

**Methods:** Surgical method: Using a posterior approach with a vertical midline incision, the distal part of the Achilles tendon including avulsion fracture is exposed. Calcaneus fracture is fixed with two CCS, and then titanium wire is passed into the hole of cannulated structure. A small incision is added on the lateral side of plantaris to identify the exit of wire. Both ends of wire are cut, bent inside proximal Achilles tendon bursa or the plantar side to avoid irritation.

Case 1: 73-year-old man slipped after drunk. Radiographs showed a beak fracture of calcaneus (Beavis classification type II). ORIF with wire and two CCS was performed. A splint was applied for 2 weeks with the foot in flexion, and full weight bearing walking was started at 6 weeks after operation. He had no post-operative complication and could walk with a cane. His Ankle-Hindfoot Scale was 95 points at the last observation.

Case 2: 85-year-old man fell into ditch. Radiographs showed a beak fracture of calcaneus (Beavis classification type II). ORIF with wire and two CCS was performed. A splint was applied for 2 weeks with the foot in flexion, and full weight bearing walking was started at 6 weeks after operation. However his wound was hard to heal and it took for 3 months, he could walk with cane. His Ankle-Hindfoot Scale was 91 points at the last observation.

Case 3: 81-year-old woman ran, resulting in severe pain in her left heel and was unable to walk. Radiographs showed a sleeve fracture of calcaneus (Beavis classification type I). ORIF with wire and two CCS was performed. A splint was applied for 4 weeks with the foot in flexion, and full weight bearing walking was started at 8 weeks after operation. She had no post-operative complication and could walk with a walker. Her Ankle-Hindfoot Scale was 86 points at the last observation.

**Results:** No postoperative complication was reported except for case 2, whose healing of wound delayed in 3 months. Bony union was achieved without re-displacement of fragment in all three cases. They regained the normal function of their ankle and their activities of daily living almost recovered to the original level.

**Conclusions:** Although there is various surgical method for this type of fractures reported, complications consisted of irritation, displacement, and skin necrosis are described in many articles. The disadvantage of this method seems to be an additional incision on plantaris. However, no serious post-operative complication was reported in our three cases. We suggest that this method may provide a strong internal fixation without complications.

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**SHORT TERM SAFETY OF ZOLEDRONIC ACID INFUSION IN CHINESE WOMEN WITH POSTMENOPAUSAL OSTEOPOROSIS: ACUTE PHASE RESPONSE MANAGEMENT AND SUBGROUP ANALYSIS**

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**Aims:** The study was focusing on Acute Phase Response (APR) with observational setting which will access the short term safety at the real clinical practice during the first 4 weeks post zoledronic acid (ZOL)
EFFECT OF ETHANOLIC EXTRACT OF CINNAMON ON MINERAL ELEMENTS AND MESOSTRUCTURE OF OSTEOPOROSIS RATS

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INTRODUCTION
* Cinnamomum burmanii Blume (CB) was Indonesia origin of cinnamon species (Blahova & Svebrovová, 2012).
* Cinnamon has been used as traditional folk herbs to treat inflammation, antioxidant, and spicy agent (Sheng et al., 2008).
* There is no study investigate the effects of Cinnamomum burmanii Blume as antosteoporosis.

OBJECTIVE
* This study was aimed to investigate the effect of ethanolic extract of cinnamon (EECB) in tibia calcium and phosphorus levels and mesostructure of overactitomized rats.

METHODS

30 Female Wistar rats, 3 months old

- Control (sham)
- Overactitomized (OVX)
- 5 mg/kg/VW
- 10 mg/kg/VW
- 15 mg/kg/VW
- 20 mg/kg/VW

- This calcium and phosphorus and another mineral elements was analyzed using X-Ray Fluorescence.
- Tibia mesostructure were assay by Scanning Electron Microscopy (SEM).

HPLC

Based on the calculation that cinnamon extract contained trans-cinnamamic acid (1.594%), eugenol (7.306%), coumarin (5.716%).

MINERAL ELEMENTS

Sham OVX OVX + Cinnamon (mg/kg/VW)

- Calcium
- Phosphorous
- Iron
- Copper
- Nickel
- Cu/P
- Ca/Zn

The level of Ca, P, Fe, Cu, Zn, Ni, and Cu/P ratio did not reveal any significant difference in OVX groups than that in sham-operated group (P > 0.05).

- The ratio of Cu/Zn was lower significantly in OVX rats compared to sham-operated rats (P < 0.05). OVX + EECB significantly (P > 0.05) increase the level of Cu/Zn ratio.

DISCUSSION
* In Cu deficiency, the activity of key oxidase in bone areas is greatly reduced, and it is presumed that this causes a reduction in collagen crosslinking (Siegel et al., 1970; Lowe et al., 2002).
* Zn support metabolism and growth of bone, increase bone density, inhibit bone loss, and involved in bonding with organic structure (Aira et al., 2007; Holloway et al., 1996).
* Reduction of Cu/Zn ratio in OVX rats indicated low collagen crosslinking and EECB may be potential to repair it although insignificantly.

MESOSTRUCTURE

- Tibia mesostructure of tibia bone in overactitomized rats (B) significantly different compared with sham-operated rats (A). The trabeculae surface of overactitomized rats supplemented with first and second (C + D) dose of Cinnamon is not different compared with overactitomized rats and the granule structure start seen in third dose group (E).

DISCUSSION
* This finding indicated that third dose of EECB induce growth of hydroxyapatite crystals (HA).
* Previous studies show that HA crystals are plate-shaped and predominantly located in close connection to the collagen type I fibers, with the long plate dimension oriented parallel to the collagen fibers (Holloway et al., 1996).
* HA crystals are believed initially to grow relatively fast (days) in the two larger dimensions (crystallographic c axis), while the growth in mineral plate thickness (crystallographic a axis) is slower (weeks) (Landis, 1999).

CONCLUSIONS
* The present study showed that granule formation as marker of hydroxyapatite crystal growth achieved at highest dose of Cinnamon.

REFERENCES

PRESENTED AT

HONG KONG '13

4th Asia-Pacific Osteoporosis Meeting
Hong Kong Convention and Exhibition Centre
December 12-15, 2013
CERTIFICATE OF ATTENDANCE

We Cyrus Cooper, Tai Pang Ip, Timothy Kwok & Sue Lo certify that:

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Has attended the IOF Regionals: 4th Asia-Pacific Osteoporosis Meeting, Hong Kong Convention and Exhibition Centre, Hong Kong, December 12-15, 2013.

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P221 / EFFECT OF ETHANOLIC EXTRACT OF CINNAMON ON CALCIUM AND PHOSPHORUS LEVELS OF OSTEOPOROSIS RATS

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Instructions for Poster Presentation

Dear Dr Zairin NOOR,

We are pleased to inform you that your abstract entitled “EFFECT OF ETHANOLIC EXTRACT OF CINNAMON ON CALCIUM AND PHOSPHORUS LEVELS OF OSTEOPOROSIS RATS”, previously referenced as IOFHK13-1282, has been accepted for a poster presentation. Please note that your Abstract has been re-numbered and your final number is: P221. This final ID is to be used for your presentation as well as for any further correspondence.

In order for you to answer questions from the poster viewers, to provide more information and to discuss your results with your colleagues, you are expected to be present at your poster in the Poster Area from 14.12.2013 13:30 to 14.12.2013 14:30.

INSTRUCTIONS FOR POSTER PRESENTERS

- Each poster will be displayed for one day only.
- At least one presenter is required to be present during the poster presentation day.
- All posters must be put up no later than 09:00 on the day of presentation and must be taken down by the end of the presentation day. Unclaimed posters will be taken down and disposed at the end of the presentation day.

Poster Size

The poster board assigned to each presenter is 2.5 m in height (H) by 1m in width (W). Only one board will be assigned for each poster presentation. The recommended size of poster is A0 Size – 1189mm (H) by 841mm (W) in portrait orientation.

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Dismantling: Posters need to be dismantled after the last Afternoon Coffee Break of assigned day. The Meeting Organizers take no responsibility for posters which are not dismantled on time.

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**Important Note**

Presenting authors of accepted abstracts are required to be registered delegates and be responsible for all expenses incurred in the production of their presentations, travel and accommodation during the Meeting.

IOF thanks you for your valuable contribution to the IOF Regionals – 4th Asia-Pacific Osteoporosis Meeting’s scientific programme.

We look forward to seeing you in Hong Kong!

With kindest regards,

Cyrus Cooper          Tai-Pang Ip
Meeting Co-Chair      Meeting Co-Chair
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