Effect of Ethanolic Extract of Cinnamon on Bone Turnover and Mineral Elements in Osteoporosis Rats

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have demonstrated a substantial improvement in femoral and lumbar trabecular microstructure and vBMD, especially at a dose of 50 μg.

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**P499**

**EFFECT OF ETHANOLIC EXTRACT OF CINNAMON ON BONE TURNOVER AND MINERAL ELEMENTS IN OSTEOPOROSIS RATS**

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Objective: To investigate the effect of ethanolic extract of cinnamon in ovariectomized rats.

Material and Methods: A total of 36 Wistar female rats were randomly divided into six groups including one control group, one ovariectomized group, and four ovariectomized groups who receiving ethanolic extract of cinnamon at dose 12.5; 25; 50; and 100 mg/kg body weight. The ovariectomized procedure was done in Pharmacology Laboratory, Medical Faculty, Brawijaya University of Malang, Expression of C-telopeptide collagen type 1 (CTX) and osteocalcin (OC) was analyzed by ELISA in Biomedical Laboratory, Faculty of Medicine, University of Brawijaya, Malang. Bone mineral elements was 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 bone turnover markers and bone mineral elements. This study was approved by Local Ethics Committee, Medical Faculty, University of Lambung Mangkurat, Banjarmasin.

Results: The level of CTX were significantly higher in ovariectomized rats compared to control group (p<0.05). The level of OC were significantly lower in ovariectomized rats compared to control group (p<0.05). Ethanolic extract of cinnamon increase CTX level significantly at dose 50 and 100 mg/kg body weight. Ethanolic extract of cinnamon in ovariectomized increase OC significantly in ovariectomized rats (p<0.05). There is no significant different of bone mineral elements in ovariectomized rats compared to control group (p>0.05).

Conclusion: We found a disharmonization of bone turnover marker and bone mineral elements in ovariectomized rats. Ethanolic extract of cinnamon is not ideal antiosteoporosis herbal.

**P499**

**EFFECT OF RED SEAWEED ON BONE PROPERTIES OF MALE RATS EXPOSED TO CHRONIC COAL DUST**

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Objective: To investigate the effect of ethanolic extract of red seaweed (Eucheuma cottonii) in bone properties (turnover, microstructure, mineral elements) of rats exposed to chronic coal dust.

Material and Methods: A total of 40 Wistar male rats were randomly divided into four groups including one control group, one group for chronic exposure of coal dust at concentration 25 mg/m³ on hour/day for 6 months, and two group chronic exposure of coal dust who receiving ethanolic extract of red seaweed (EERS) at dose 150 and 300 mg/kg body weight. The exposure to coal dust exposure was conducted using equipment that was designed by and available from Pharmacology Laboratory, Medical Faculty, Brawijaya University of Malang, Expression of C-telopeptide collagen type 1 (CTX) and osteocalcin (OC) was analyzed by ELISA technique. Bone microstructure was assayed using scanning electron microscope (SEM). Bone mineral elements were assayed by X-ray fluorescence. ANOVA test was used to analyze the different level of all parameter. This study was approved by Local Ethics Committee, Faculty of Medicine, University of Lambung Mangkurat, Banjarmasin.

Results: Chronic coal dust exposure increase bone turn over marker and phosphorus level, but decrease calcium level significantly compared to control group (p<0.05). SEM showed higher porosity of trabecular in chronic coal dust exposure compared to control group. Administration EERS decrease bone turn over marker to reach level in control group at all dose. Administration EERS increase calcium and decrease phosphorus level to reach level in control group at dose 300 mg/kg body weight. Administration of EERS decrease porosity of trabecular bone to reach level in control group.

Conclusion: Ethanolic extract of red seaweed (Eucheuma cottonii) at dose 300 mg/kg body weight improved bone properties in osteoporosis caused by chronic coal dust exposure.

Acknowledgements: Ministry of Research and Technology of Indonesia (Riset InSINAS 2012)
EFFECT OF ETHANOLIC EXTRACT OF CINNAMON ON BONE TURN OVER AND MINERAL ELEMENTS IN OSTEOPOROSIS RATS

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Introduction

The model of bilateral ovariectomized rats mimics the accelerated bone loss observed in postmenopausal women due to estrogen deficiency (Folkowicza et al., 2012).

Previous studies show that ovariectomized rats showed significant gradual increase in serum calcium and phosphorus level (Sikandia et al., 2011).

Besides, blood zinc and copper levels in ovariectomized rats were significantly increased compared to the sham control (Liang et al., 2011).

Cinnamomum burmanicum Burm (CB) was Indonesia origin of cinnamon species (Bilalbuddin & Suroto, 2012).

The extract of cinnamon cassia contain several active compounds, including essential oil, cinnamic aldehyde & cinnamyl alcohol, tannin, mucous, & carbohydrate (Kwon et al., 2010).

Objective

To investigate the effect of ethanolic extract of cinnamon in ovariectomized rats.

Methods

36 Winter female rats, 3 months old

<table>
<thead>
<tr>
<th>Group</th>
<th>Treatment</th>
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<tbody>
<tr>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>Ovariectomized</td>
<td>Cinnamomum burmanicum (CB) 12.5 mg/kg/RW</td>
</tr>
<tr>
<td>Ovariectomized</td>
<td>Ovary (Ox)</td>
</tr>
<tr>
<td>Ovariectomized</td>
<td>Ovariectomized + Cinnamomum burmanicum (CB) 25 mg/kg/RW</td>
</tr>
<tr>
<td>Ovariectomized</td>
<td>Ovariectomized + Cinnamomum burmanicum (CB) 50 mg/kg/RW</td>
</tr>
<tr>
<td>Ovariectomized</td>
<td>Ovariectomized + Cinnamomum burmanicum (CB) 100 mg/kg/RW</td>
</tr>
</tbody>
</table>

Results

Bone formation

- Increase bone formation due to increased osteoblast activity and stimulated proliferation of bone progenitor cells.
- Extract of Cinnamomum burmanicum significantly increase the activity of osteoblast cells.

Bone resorption

- Increase bone resorption due to increased activity of active compounds, such as cinnamal.

Cinnamal level from Indonesian cinnamon is 2.6505±0.119 mg/kg (Bilalbuddin & Suroto, 2012).

Kiely et al., (2003) proceeded activity of 1,1,2,3-tetrafluoro-2-methylpropanoxime, 1,1,2,3-tetrafluoro-4-ethylpyridine.

Conclusions

- We found a deamination of bone turn over and bone mineral elements in ovariectomized rats.
- Ethanol extract of cinnamon is not ideal as anti-osteoporosis herbal.

References


European Congress on Osteoporosis and Osteoarthritis
17-20 April 2013, Rome, Italy.
CERTIFICATE OF ATTENDANCE

We, Professors John A. Kanis & Jean-Yves Reginster, Co-Presidents, certify that:

Zairin NOOR

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