The Effect of Acute and Subchronic Inhalation Particulate Matter 10 (PM10) of Coal Dust in Femur Mineral Element of Rats

B. Setiawan., Z. Noor
P190
THE EFFECT OF ACUTE AND SUBCHRONIC INHALATION PARTICULATE MATTER 10 (PM10) OF COAL DUST IN FEMUR MINERAL ELEMENT OF RATS
B. Setiawan 1, 2, Z. Noor 2
1Medical Chemistry and Biochemistry, Faculty of Medicine University of Lambung Mangkurat, Banjarbaru, 2Orthopaedic, Ulin General Hospital Faculty of Medicine University of Lambung Mangkurat, Banjarmasin, Indonesia

Aims: To elucidate whether inhalation acute and subchronic particulate matter 10 (PM10) of coal dust potential change bone mineral elements of femur rats.

Methods: After 1 week acclimatization, 35 Wistar male rats were randomly divided into seven groups, including one control group, three groups exposed to coal dust for 14 days, and three groups exposed to coal dust for 28 days. The three groups at the 14 and 28 days exposures received a dose of coal dust equal to 6.25 mg/m², 12.5 mg/m², and 25 mg/m², respectively. 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. Bone mineral elements were assayed by X-ray fluorescence in Central and Physics Laboratory, Malang State of University, Malang, East Java, Indonesia. Nonparametric test was used to analyze the different level of bone mineral elements. This study was approved by Local Ethics Committee, Medical Faculty, Brawijaya University of Malang.

Results: The level of phosphorus, calcium, iron, nickel, copper, zinc were not significantly different in acute coal dust exposure compared to control groups (p<0.05). The level of phosphorus, calcium, iron, nickel, copper, zinc were not significantly different in subchronic coal dust exposure compared to control groups (p<0.05).

Conclusion: Acute and subchronic inhalation to particulate matter 10 (PM10) of coal dust does not change the composition of femur mineral elements in rats.

P191
INTRACELLULAR IRON CONCENTRATION DETERMINES THE EXPRESSION OF FERROPORIN 1 IN CULTURED OSTEObLAST HF0B1.19
G-Y Zhao 1, Y-J Xu 1
Department of Orthopaedics, The Second Affiliated Hospital of Soochow University, Suzhou, China

Aims: To examine the regulation of ferroportin 1 (FPN1) by intracellular iron concentration in human osteoblast.

Methods: Human osteoblast cells (hFOB1.19) were treated with ferric ammonium citrate (FAC) or deferroxamine (DFO) of different concentrations. The intracellular iron was measured by a confocal laser scanning microscope (CLSM).

The expression of FPN1 at mRNA and protein levels was detected with real-time quantitative polymerase chain reaction (CRP), Western blots and immunofluorescence.

Results: The confocal microscopy measurements showed that the fluorescence intensity representing intracellular iron concentration was significantly weakened with increasing of FAC concentration and enhanced with increasing of DFO (p<0.05, for all comparisons). The real-time CRP, Western blots and immunofluorescence indicated that the mRNA and protein expression of FPN1 in osteoblast was increased with increasing of FAC in a concentration-dependent manner and decreased with increasing of DFO in a concentration-dependent manner (p<0.05, for all comparisons).

Conclusion: Increasing of intracellular iron ion by the FAC treatment increased the FPN1 expression. In contrast, decreasing intracellular iron ion by the DFO treatment decreased the FPN1 expression. The changes of FPN1 expression may help to maintain the balance of intracellular iron in osteoblasts.

Acknowledgements: This work was financed by a grants from Doctoral Fund of Ministry of Education of P.R. China (No 20103201110020), Research Innovation Project of Postgraduate of Colleges of Jiang Su Province (No CXLX11_0086).

P192
ROLE OF THORACIC-LUMBAR SPINE X-RAY IN THE OSTEOPOROTIC DIAGNOSIS: TIANLIAO OLD PEOPLE STUDY (TOPS 4)
Y-F Chang 1, 2, C-S Chang 1, C-W Wu 2, C-W Tu 3, C-Y Chen 4, P-H Kuo 5, C-H Wu 1
1Family medicine, National Cheng Kung University Hospital, 2Family medicine, Kao General Hospital, Tainan, 3Department of Medicine, College of Medicine, National Taiwan University, Taipei, 4Public Health Center, Kaohsiung, 5Department of Public Health & Institute of Epidemiology, College of Public Health, National Taiwan University, Taipei, Taiwan, China

Aims: To reveal whether lateral view of thoracic-lumbar spine X-ray should be added in the diagnosis of osteoporosis at high prevalence area in osteoporosis.

Methods: Subjects were randomly sampled among 1,040 women over 65 years old (74.3±6.0 y/o) from Tianliao Township in July 2009. After excluding death (n=4), empty houses (n=165), and those who refused to participate (n=118), a total of 368 subjects were enrolled in the final analysis (the response rate was 75.7 %). The diagnosis of osteoporosis were confirmed either by different methods: (1) fractures history, (2) compression fractures based on lateral view of thoracic-lumbar spine X-ray or (3) BMD T-score ≤−2.5 on total hip, femoral neck, lumbar spine and 3 sites. The prevalence of osteoporosis were compared among three models as model I (1+2) vs. model II (1+3) vs. model III (1+2+3), respectively. The diagnostic discordance was defined by the difference between model II and III.
THE EFFECT OF ACUTE AND SUBCHRONIC INHALATION OF PARTICULATE MATTER 10 (PM_{10}) OF COAL DUST IN FEMUR MINERAL ELEMENT OF RATS

Bambang Setiawan, Zairin Noor

Department of Medical Chemistry and Biochemistry, Faculty of Medicine, University of Lambung Mangkurat, Banjarbaru, South Kalimantan, Indonesia.
Department of Orthopaedic, Ulin General Hospital, Faculty of Medicine, University of Lambung Mangkurat, Banjarmasin, South Kalimantan, Indonesia.

INTRODUCTION

- Inhalation of coal dust in occupational and atmospheric setting can cause respiratory disorders, such as inflammation, chronic bronchitis, among others.
- Our preliminary in vivo study indicates that coal dust can decrease osteoclast population and increase osteoblast population, indicating that coal dust can induce bone turnover disorder, may be osteoporosis.
- Organic and inorganic components are responsible for toughness and rigidity of bones, mechanical strength of the bone.
- The substitution of atomic mineral in bone change hydroxyapatite crystal, behavior of bone cell, and microstructure of trabecular.

METHODS

- This study was aimed to elucidate whether inhalation acute and subchronic particulate matter 10 (PM_{10}) of coal dust potential change bone mineral elements of femur rats.

RESULTS

- The level of phosphorus, calcium, iron, nickel, copper, zinc were not significantly different in acute coal dust exposure compared to control groups (p>0.05).
- The level of phosphorus, calcium, iron, nickel, copper, zinc were not significantly different in subchronic coal dust exposure compared to control groups (p>0.05).

DISCUSSION

- Valley-Regis & Arico [2008] shows the possibility of substitution of several atomic mineral in bone structure hydroxyapatite crystal.

CONCLUSION

- Acute and subchronic inhalation to particulate matter 10 (PM_{10}) of coal dust doesn't change the composition of femur mineral elements in rats.

Presented at

The 3rd Asia - Pasific Osteoporosis Meeting
KUALA LUMPUR CONVENTION CENTRE
13 - 16 DECEMBER 2012
EACCME
EUROPEAN ACCREDITATION COUNCIL FOR
CONTINUING MEDICAL EDUCATION

CERTIFICATE

IOF has been accredited by the European Accreditation Council for Continuing Medical Education (EACCME) to provide the following CME activity for medical specialists.

IOF Regionals – 3rd Asia-Pacific Osteoporosis Meeting is designated for a maximum of, or up to 17 European CME credits (ECMEC).

Zairin Noor HELMI
Indonesia

CYRUS COOPER
Scientific Programme Committee Co-Chair

Each medical specialist should claim only those credits that he/she actually spent in the educational activity.
The EACCME is an institution of the European Union of Medical Specialists (UEMS), www.uems.net.
Through an agreement between the European Union of Medical Specialists and the American Medical Association, physicians may convert EACCME credits to an equivalent number of AMA PRA Category 1 Credits™. Information on the process to convert EACCME credit to AMA credit can be found at www.ama-assn.org/go/internationalcme.
Live educational activities, occurring outside of Canada, recognized by the UEMS-EACCME for ECMEC credits are deemed to be Accredited Group Learning Activities (Section 1) as defined by the Maintenance of Certification Program of The Royal College of Physicians and Surgeons of Canada.

www.iofbonehealth.org/kualalumpur-2012
CERTIFICATE OF POSTER PRESENTATION

We Cyrus Cooper, Ambrish Mithal, Joon Kiong Lee & Swan Sim Yeap certify that:

Mr Bambang Setiawan

Poster ID P190: THE EFFECT OF ACUTE AND SUBCHRONIC INHALATION PARTICULATE MATTER 10 (PM10) OF COAL DUST IN FEMUR MINERAL ELEMENT OF RATS


Cyrus Cooper
Scientific Programme Committee Co-Chair

Ambrish Mithal
Scientific Co-Chair
IOF RAC Chair

Joon Kiong Lee
LOC Co-Chair
President, OASKL

Swan Sim Yeap
LOC Co-Chair
President, MOS

www.iofbonehealth.org/kualalumpur-2012