BONE EFFECT UNDER CAUSED BY CO-EXPOSURE TO BONE METABOLISM ABNORMALITY AND RENAL LOW LEVEL URINE ARSENIC CONCENTRATION

Methods

The population-based study group was selected from people living in fluoride–arsenic polluted areas due to burning coal in China. The total number of participants was 196 to observing the changes in gene and protein expression of PTH/PKA/AP1 signalling pathway. A total of 90 weaned specific pathogen-free SD rats were randomly assigned to a group to explore the role of PTH-cAMP-PKA signalling pathway. A total of 90 weaned specific pathogen-free SD rats were randomly assigned to a group to explore the role of PTH-cAMP-PKA signalling pathway on bone toxicity.

Results

Fluoride can increase the expression levels of PTH, PKA, and AP1, but arsenic can only affect the expression of AP1. Fluoride and arsenic have an interaction on the expression of AP1, c-fos and Runx2. Fluoride exposure can affect the metabolism of collagen and bone resorption, and arsenic exposure main affect bone resorption, fluoride and arsenic co-exposure have a more significant effect on bone resorption.

Conclusion

PTH-PKA-AP1 and PTH-cAMP-PKA signalling pathway may play an important role in bone toxicity of fluoride. Arsenic can affect the expression of c-fos and Runx2, thereby affecting the expression of transcription factor AP1, MMP-9, RANKL and Osterix, indirectly involved in fluoride induced bone toxicity. The main sign of bone damage under the exposure level of the study is osteoclastosis and main combined bone toxicity of fluoride and arsenic showed antagonistic effects.

Reference

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BONE METABOLISM ABNORMALITY AND RENAL DYSFUNCTION IN CADMIUM EXPOSED FARMER FROM THAILAND

Introduction

Paddy fields in Mae Sot, Tak province of Thailand are polluted with cadmium (Cd) over safe level. Farmers exposed Cd from contaminated rice consumption and the high prevalence of kidney dysfunction was shown in the exposed population. Bone fracture is another Cd related pathology which shown in elderly with high exposure level. The identification of high risk individuals will be advantageous to provide suitable health promotion and to prevent severe pathology. This study was done to compare bone fracture risk between glomerular dysfunction, proximal tubular dysfunction and Calcium (Ca) handling abnormality.

Methods

Serum osteocalcin and cross-linked N-telopeptide of type I collagen to detect bone metabolism abnormalities, whereas glomerular filtration rate, serum cystatin C, urinary β2-microglobulin (β2-MG) and fractional excretion of calcium