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Biological monitoring of occupational exposure for b-mnserum samples from iron casting workers

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The furnace-men and melting department workers are potentially exposed to manganese particles or fume in the workplace which accumulates in their central nervous system and neurological disorder observed for exposed workers. The objective of the research was to investigate the sources and levels of manganese exposure in the foundry by correlation of blood-manganese (B-Mn) and air-manganese (air-Mn) measurement. Air-Mn and B-Mn were measured involving workers (case= 35, control=35) who worked in a big size foundry during one year. The standard method of OSHA- ID121 was used for the air and blood assessment and atomic absorption spectroscopy (AAS) was carried out in air and blood sample analysis. The air sampling results revealed that there is a high exposure to manganese (4.5 mg/m3) in the workplace compare to NIOSH time weighted average (Reference TWA= 1 mg/m3). The average blood Mn concentration was 2.745 and 274.85 µg/l for less than three months (n=35) and 3-12 months working experience (n= 35), respectively, it implies that there is a high accumulation of manganese in their blood. Risk assessment based on mutual evaluations of B-Mn and air-Mn seems to be valid in the understanding of workers' hazard. Our study indicates that B-Mn assessment by AAS may be a precise procedure for estimation of exposure condition based on working experience (more than 3 months).

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Biomedical applications of calcium phosphates ceramics

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The present conference provides brief information on calcium phosphate bioceramics and describes in details current state-of-the-art and recent developments on the subject, starting from synthesis and characterization to biomedical and clinical applications. Furthermore, future perspectives are too discussed.Among the recognized orthopedic and dental cares, calcium phosphates are most of the time used to restore damaged bones and in periodontics, due to the chemical similarity to human bones and teeth. Besides, the most of the synthetic calcium phosphates of high purity seem to be well tolerated by human tissues in vivo and have the excellent biocompatibility, osteoconductivity and bioresorbability.Usual biomedical applications of calcium phosphate bioceramics contain artificial replacements for teeth, knees, hips, tendons and ligaments, in addition to repair for maxillofacial reconstruction, augmentation and stabilization of the jawbone, spinal fusion, bone fillers after tumor surgery and periodontal diseases. Among others, biomimetically synthesized formulations in the presence of collagen, chitin, gelatin, and/or alginate appear to be the most promising candidates for clinical applications. In addition, preparation and application of nanodimensional calcium orthophosphates are the important topics in modern material science and such formulations have already been tested clinically for various purposes. The specific advantages of the use of calcium phosphate-based biocomposites in various applications are highlighted. Like the way from a laboratory of a hospital is a long one and the prospective biomedical candidates have to meet a lot requirements, the scientific challenges that need research and development are even considered. Moreover, other applications of calcium phosphate bioceramics are demonstrated in drug delivery systems and tissue engineering purposes because they are effective carriers of growth factors, bioactive peptides and various types of cells.

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