

TOXICOLOGY AND APPLIED PHARMACOLOGY

July 20-22, 2017 | Chicago, USA

Chromosomal mutations of hematologic malignancies of the elderly: Chromosomal aberrations of indeterminate potential in MIC-exposed Bhopal population

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Numerical and structural alterations in human chromosomes indicate exposure to chemicals/radiation, heritable congenital disorders and acquired malignancies. Hematologic malignancies are diagnosed and prognosticated based on the chromosomes involved and complexity of rearrangements. Acquisition of mutations of genes and chromosomes due to biological senescence among elderly results in foundation of clonal abnormalities of indeterminate potential, which is agitated further by other cooperating mutations for neoplastic patho-mechanism. Myelodysplastic syndrome (MDS) has been characterized with pre-malignant hematopoietic changes causing blood cytopenia and marrow dysplasia in ~18.4% elderly of ~65 years median age with a high risk of acute leukemia. Predominantly del/-(5, 7), trisomy 8, del(20q), -Y as single or in combination with complex rearrangements indicate severity of the disease and risk of transformation. Conventional cytogenetic analysis in bone marrow of the cytopenic elderly and peripheral blood of the methyl isocyanate (MIC)-exposed Bhopal people revealed multiple clonal abnormalities, which may indicate early onset of hematopoietic disorder in the MIC-exposed people. Chromosomal aberrations (CA) detected in stimulated blood-lymphocytes may represent cytogenetic CHIP (clonal hematopoiesis of indeterminate potential) and warrants marrow-cytogenetics for screening of specific mutations. MIC-exposed Bhopal people are aged ~60 years or more 30 years post-disaster and presented with blood cytopenia. However, multiples of environmental and occupational confounders might have cooperated with their life-style/tobacco consumption for yielding chromosomal damage as a result of gene-environment interaction. Therefore, it is not apparent that MIC-exposure is the sole cause of such chromosomal rearrangements, even after adjustment of initial level of damage measured immediately after the accident. However, ascertainment of CA is essential in bone marrow of those selective individuals of Bhopal for detection of clonal aberrations and early therapeutic intervention. Since mRNA splicing and epigenetic mutations are demonstrated as founder mutation of MDS, screening of gene mutations of several functions in MIC-exposed population may direct re-understanding of disease mechanism and tailoring targeted drugs for such exposure/population.

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The adverse health effects of boron on women

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In the last twenty years; there has been growing controversy over whether or not boron, a vital trace element, is essential and if so, to what extent. Although many studies have been conducted on the health effects of men, studies pertaining to the health effects boron has on women are scarce. This scarcity contributes to an even larger amount of ambiguity concerning the role boron plays in health. Some studies found indicate that boron may cause harm to women if consumed in large amounts while other studies indicate consuming larger amounts of boron may have beneficial health effects on women. A key reason why there is ambiguity on the topic of boron and women is because there is no standard limit on how much boron a woman should consume each day in order to remain healthy. The purpose of this paper is to assess whether boron is a risk factor for complications with women's health, with a focus on cancer (breast cancer, cervical cancer, lung cancer and prostate cancer) and to assess whether boron is essential or not and if so, to what extent. Discussions will also be made on the academic advancements research on the health effects of boron on women have made on what should be the healthy limit of boron intake. Ultimately this paper serves as a systematic review of boron that will help provide suggestions for why this ambiguity exists and where researchers are headed in trying to find amounts of boron that better and/or harm the health of a woman. The first part of this paper will review the steps taken to gather research documents for the systematic review. The ultimate purpose of this systematic review is to propose a future research agenda related to the effects of boron on women.

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