CYTOGENTICAL STUDIES OF MITOMYCIN-C DRUG ON THE BONE MARROW CHROMOSOMES OF MALE ALBINO MICE *Mus musculus*

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TO

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بسم الله الرحمن الرحيم

وَاللَّهُ خَلَقَ كُلَّ دَابَّةٍ مِنْ مَاءٍ ۖ فَمِنْهُمْ مَنْ يَمْشِي
عَلَىٰ بَطْنِهِ وَمِنْهُمْ مَنْ يَمْشِي عَلَىٰ رِجْلَيْنِ وَمِنْهُمْ
مَنْ يَمْشِي عَلَىٰ أَرْبَعٍ ۚ يَخْلُقُ اللَّهُ مَا يَشَاءُ ۚ إِنَّ
اللَّهَ عَلَىٰ كُلِّ شَيْءٍ قَدِيرٌ

﴿النور : ٤٥﴾


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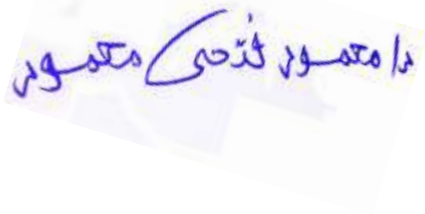

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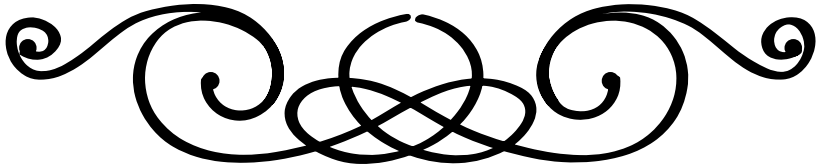

ABSTRACT

Mitomycin-C (MC) is an anti-cancer drug has a genotoxic effect on the bone marrow cells as this influence extends to the testicular tissue. The aim of this work is to study the genotoxic effect on bone marrow chromosomes, DNA content and testicular tissue of male albino mice after mitomycin-C treatment. Sixty male albino mice (16-17 weeks old and 28 ± 2 g. weight) were used in the present study and divided into five groups each group consists of 12 mice. The first group served as control was injected intrapretonialy with (physiological saline solution 1ml/kg b.wt.) while the second group was treated with mitomycin-C (3 mg/kg b.wt.) for one week, group (3) was treated with mitomycin-C (3 mg/kg b.wt.) for two weeks, group (4) was treated with mitomycin-C (6 mg/kg b.wt.) for one week and group (5) was treated with mitomycin-C (6 mg/kg b.wt.) for two weeks. Each mitomycin-C treated animal was intraperitoneally injected single time at the first day of the experiment.

Results indicated that the treating male mouse with mitomycin-C showed chromosomal aberrations in bone marrow cells whether structural aberrations and numerical aberration. Structural aberrations were deletion, fragmentation, chromatid gap, centric fusion, centromeric attenuation, ring and chromosomal gapping. While numerical aberration was polyploidy. Results of chromosomal aberrations indicated that the rates of total aberrations were increased by time and dose.

Abstract

Micronucleus assay illustrated that mitomycin-C treatment induced genotoxicity in bone marrow cells, and the rate of polychromatic erythrocytes with micronucleus was increased by dose. Also, cytotoxicity test showed that the polychromatic erythrocytes (PCEs) to normochromatic erythrocytes (NCEs) ratio was increased by dose.

In the current study, genetic changes among control and all treated groups have been studied according to RAPD-PCR analysis. Results indicated that mitomycin-C treatment induced genetic changes among control and all treated groups. Comet assay showed that mitomycin-C treatment induced DNA damage in mice lymphocytes and the mean of total comet score was increased by dose and time among all treated groups.

The damage caused in the testis of mice after mitomycin-C treatment displayed variable changes in both the seminiferous tubules and the interstitial tissue. Changes in seminiferous tubules were represented by hypoplasia of the germinal epithelium and spermatogenic arrest at various stages of spermatogenesis. The most prominent changes reported in the intertubular tissue were represented by the presence of a homogeneous and intensely eosinophilic ground substance in the interstitial areas, congestion of blood vessels as well as haemorrhage in the interstitial tissue. The histological changes were also significantly increased by time and dose.

Key words: Mitomycin-C, Chromosomes, Micronucleus, DNA, RAPD-PCR, Comet assay, Histopathology, Testis, Mice.

Contents

LIST OF TABLES AND LIST OF FIGURES

List of Tables