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HEMATOLOGICAL AND PATHOLOGICAL EFFECTS OF ACRYLONITRILE AND TREATMENT BY ALPHA LIPOIC ACID IN ALBINO MALE RATS

Anas A. Humadi[1] and Bushra Al Qaisei[2]

[1]Department of Pathology, College of Veterinary Medicine, University of Diyala, Iraq
[2]Bushra Al Qaisei, Dep. of Pathology, College of Veterinary Medicine, University of Baghdad, Iraq

email: anashumady@yahoo.com

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ABSTRACT : This study provides details on effect of Acrylonitrile (AN) in blood profile and pathological changes in liver and kidney in male albino rat, the aims of present study were detected the influence of AN and role of ALA as antioxidant to the toxic effects of AN in the male rats, the present article was include (130 albino rat) divided into five groups, their age ranged from 8-9 week. The doseof Acrylonitrile (40 mg / kg of BW) and doseof Alpha lipoic acid (600 mg /kg of BW) and the period of this study 90 days. The hematological examination showed increased in WBCs (15.31±1.11) while decreased in RBCs (6.68±0.30), Hb (13.15±0.12), platelets (670±20.86) in 2nd group, while in 4th and 5th group showed significant amelioration in RBCs, Hb and platelets, without any change in 3rd group. The pathological examination revealed in 2nd group in liver and kidney enlargement and pale in color, The histopathological changes in liver showed extensive necrosis, dilation in sinusoid, increased cellularity, cirrhosis, granulomatous reaction and sever infiltration of inflammatory cells in 2nd group, in 4th group showed acute cellular swelling with mild sinusoid and infiltration of neutrophils, in 5th group showed moderate infiltration of inflammatory cells, sinusoid dilation with extensive hemorrhage, fibroblast cells aggregation with midzone areas of necrosis.while the histopathological changes in kidney showed renal cortex dilated tubules, enlargement glomeruli, calcified heavy interstitial infiltration and aggregation of lymphocytes, congested with heavy MNCs infiltration in 2nd group, in 4th group showed mild acute cellular swelling, hyper cellularity of glomeruli, in 5th group showed acute cellular swelling and degeneration in epithelial lining of proximal and distal convoluted tubules.

Key words : Albino male rats, ALA, AN, pathological effects.

INTRODUCTION

Acrylonitrile (AN) is an important industrial hazard chemical used extensively in the manufacture of synthetic fibers, resins, plastics, elastomers, and rubber for a variety of consumer goods, such as textiles, drink-ing cups, automotive parts, and appliances (Brazdil, 2010). It is also used as a monomer for acrylic and modacrylic fibers, in plastics, surface coatings as a chemical intermediate, in organic synthesis, in home furnishings, in nitrile rubbers, and as a modifier for natural polymers and pesticides (HSDB, 2016; Simon *et al,* 2016). Also IARC (1999) were found lower exposure to AN occurred in the plant that dried the polymer before the spinning operation resulting in lower monomer content in the polymer.

Acrylonitrile is not known to occur naturally and there are no known reactions that could lead to insitu formation of this substance in the atmosphere and the main source of exposure to acrylonitrile is occupational, since its primarily used in industry, although individuals may be exposed to low concentrations of AN from some consumer products and cigarette smoke (IPCS, 2002). In occupations where acrylonitrile is used suitable personal protective equipment is recommended to reduce the potential for exposure (IPCS, 2001; NIOSH, 2005).

Human may be exposed to the AN around factories where it is made for used or near chemical waste sites which it has been improperly stored or disposed, two most likely exposure pathways are breathing acrylonitrile that has evaporated in to air or drinking water that has been contaminated due to AN is highly soluble and stable in water (Simon *et al*, 2016).

NICNAS (2000) referred to approximately (2000 tons) of AN per year were used and (70%) of which used for manufacture of styrene acrylonitrile polymer, which is further compounded in to plastic resins and the remainder is used in manufacture polymers (polymer dispersed in water) for adhesive and coating applications, where found the personal exposure levels were slightly higher in latex than styrene – acrylonitrile polymer and plastic resin manufacturing plants.