

INVESTIGATION OF THE ANTIOXIDANTS LEVELS IN PATIENTS WITH GASTROINTESTINAL CANCER AND THE EFFECT OF CHEMOTHERAPY

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ABSTRACT : Gastro-Intestinal (GI) cancer is a term for the group of cancers that affect the digestive system. The aim of this study is to assess the relationships between antioxidants and chemotherapy. Antioxidants markers such as superoxide dismutase SOD, Catalase CAT and Glutathione GSH and lipid peroxidation marker such as Malondialdehyde MDA were analyzed in fifty patients with gastrointestinal cancer before and after exposure to chemotherapy. The results of the study showed a significant decrease in the activity of SOD, CAT enzymes before and after treatment in comparison to healthy control samples also decline in GSH concentration, while the levels of MDA were increased significantly. The results indicate oxidative stress and DNA damage activity increase in GIT cancer and there is no response to chemotherapy.

Key words : Catalase, gastrointestinal cancer, antioxidant enzymes, lipid peroxidation.

INTRODUCTION

Gastrointestinal tract cancer (GIT.C) is one of the common cancers in the world-wide (Ghadimi *et al*, 2011). The GI tract and the accessory organs of digestion (pancreas, liver, gall bladder) are responsible for more cancers and more deaths from cancer than any other system in the body (Yamada and Alpers, 2009). The burden of GIT C is heavy for patients with gastrointestinal disease, because it is the major cause of mortality and hospital admissions. Furthermore, increase in the incidence of most gastrointestinal diseases has major implications for health care systems and health communities (Williams *et al*, 2007).

Free radicals another name for them is "reactive oxygen species" can be hazardous to the body and damage all major components of cells, including DNA, proteins, and cell membranes. The damage to cells caused by the increasing of ROS, especially the damage to DNA, may play a role in the development of cancer and other health conditions (Diplock *et al*, 1998; Valko *et al*, 2007). The body makes some of the antioxidants that it uses to neutralize free radicals called endogenous antioxidant defense mechanisms, such as superoxide dismutase and catalase can overcome ROS activity (Ziech *et al*, 2010; Fuchs-Tarlovsky, 2013). Another antioxidant defense mechanism includes nonenzymatic antioxidants such as glutathione (GSH) (Misra *et al*,

2009). One of such oxidation products is lipid peroxidation products which are formed when ROS attack polyunsaturated fatty acids (PUFAs) leading to membrane structural and/or functional damage (Yoshida *et al*, 2013). Among the common lipid peroxidation products are malondialdehyde (MDA) (Esterbauer *et al*, 1991).

MATERIALS AND METHODS

The samples comprised from 50 patients with gastrointestinal tract cancer selected from Merjan Teaching Hospital in Babylon, Iraq in Oncology Center. Blood samples of 25 individuals were collected as a control to compare with case patients. A questionnaire was taken from people included in the study. It included: Age, Sex, Smoking, Family history, Duration of disease, Number of chemical doses, Residence, Type of cancer. Three milliliters of venous blood were taken from both patients and control was used to separate the serum after clotting the blood by centrifugation at 5000 rpm for 10min then kept in eppendorf tubes at -20°C until used.

The activity of Superoxide dismutase was determined by use a simple and rapid method, based on the ability of the enzyme to inhibit the autoxidation of pyrogallol according to Marklund and Marklund, (1974). Catalase assay was measured according to procedure of Hadwan and Kadhum (2018). Glutathione concentration was determined according to the method of Beutler *et al* (1963) and Moron *et al* (1979). Lipid peroxidation had