دراسات بيوكيميائية علي تأثير الجرعات الزائدة من الحديد في الفئران البيضاء

رسالة مقدمة من

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6-CONCLUSION

In our study, the iron overload induced in rats by intraperitoneal injection of iron dextran for 4.5 month leading to many toxic effects in the liver, spleen, testes, heart and kidneys since it increasing lipid peroxidation, modulating antioxidant enzymes and glutathione, impairment of liver and kidney functions as well as impairment of lipid metabolism and induction of hyperglycemia, also alter blood picture and decreasing body weight. All of these toxic effects lead to tissue injuries and may lead to cancer and even death. The use of turmeric powder as spice in the food improved to some extent the toxic effects induced by iron overload .

INTRODUCTION

Iron is the fourth most common element on the earth and is one of the most studied nutrients in human health. Iron exists in two main forms; ferric (Fe^{3+}) and ferrous (Fe^{2+}), the possibility of oxidation and reduction of the iron makes it an important trace element for many cellular redox reactions. Iron is required by all living cells for many biochemical reactions especially for aerobic and anaerobic metabolism and cell proliferation ***(Cazzalo et al., 1990).***

Iron is an important component of molecules that undergo redox reactions in the cells; however, this property also makes iron potentially toxic, since redox reactions may generate reactive oxygen species ***(Fridovich, 1998).***

ROS were known to damage proteins, lipid and DNA, as consequence cells and organisms had developed several mechanisms to reduce toxicity by iron ions which include highly regulated trans-membrane iron transport, intracellular iron chelations and enzymatic destruction of ROS. An imbalance of these mechanisms increase susceptibility to oxidative damage resulting in mutation, cancer, neurological diseases, iron overload and iron deficiency related diseases ***(Meneghini, 1997).***

Niederau et al., (1996) reported that high level of iron (iron overload) was associated with an increase risk of cancer, heart diseases and other illness such as endocrine problems, arthritis, diabetes and liver diseases.

Kontoghiorghes et al., (2001) demonstrated that two chelating agents; desferroxamine and deferriprone were used in the treatment of iron overload

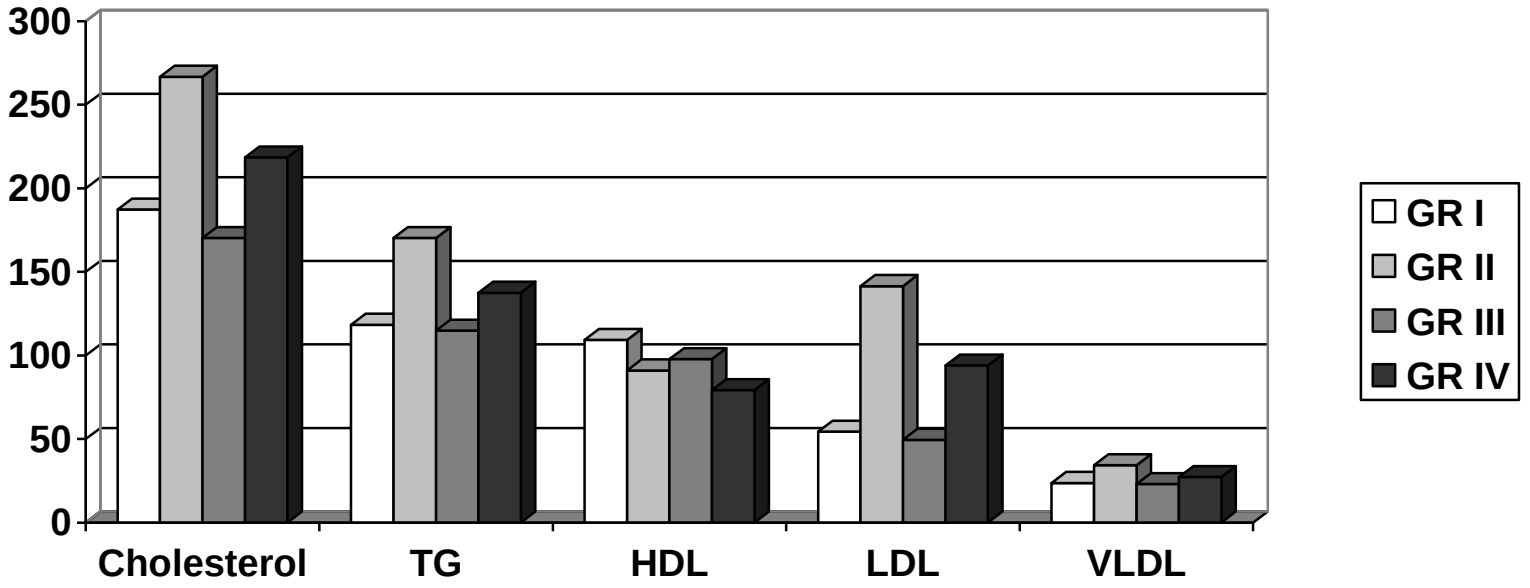
diseases. Although both drugs were very effective, they exert several side effects and disadvantages.

Medicinal plants and their active principles had received great attention as a potentially antiperoxidative agents ***(Lee and Park, 2003)*.**

Curcuma longa (turmeric) is a perennial herb that grow to a height of three to five feet and is cultivated extensively in Asia (India and China) and other countries with a tropical climate. Curcumin, the active ingredient from the spice turmeric is a potent antioxidant and anti-inflammatory agent with hepatoprotective, anticarcinogenic and antimicrobial properties ***(Pal et al., 2001).***

The aim of the present work is planned to study the effect of iron overload on serum iron profiles (serum iron concentration, TIBC, UIBC, transferrin and transferrin saturation percent) and the degree of iron deposition within liver, spleen, testes, heart and kidneys. Also the work is extended to show the effect of iron overload on lipid peroxidation, glutathione and antioxidant enzymes (GPx and GST) of the same tissues. Furthermore, we examined the serum parameters related to liver and kidney functions, glucose level and serum lipid profiles (total cholesterol, triacylglycerols, HDL-c, LDL-c and VLDL-c). Finally, this work is extended to show the effect of iron overload on blood picture and histopathological feature of rats. The work is also planned to show the protective effect of turmeric against iron overload on the same parameters.

Fig. (13): Effect of iron over load (200 mg/ kg b.wt) and turmeric (1% in diet) on serum lipid profile of rat.



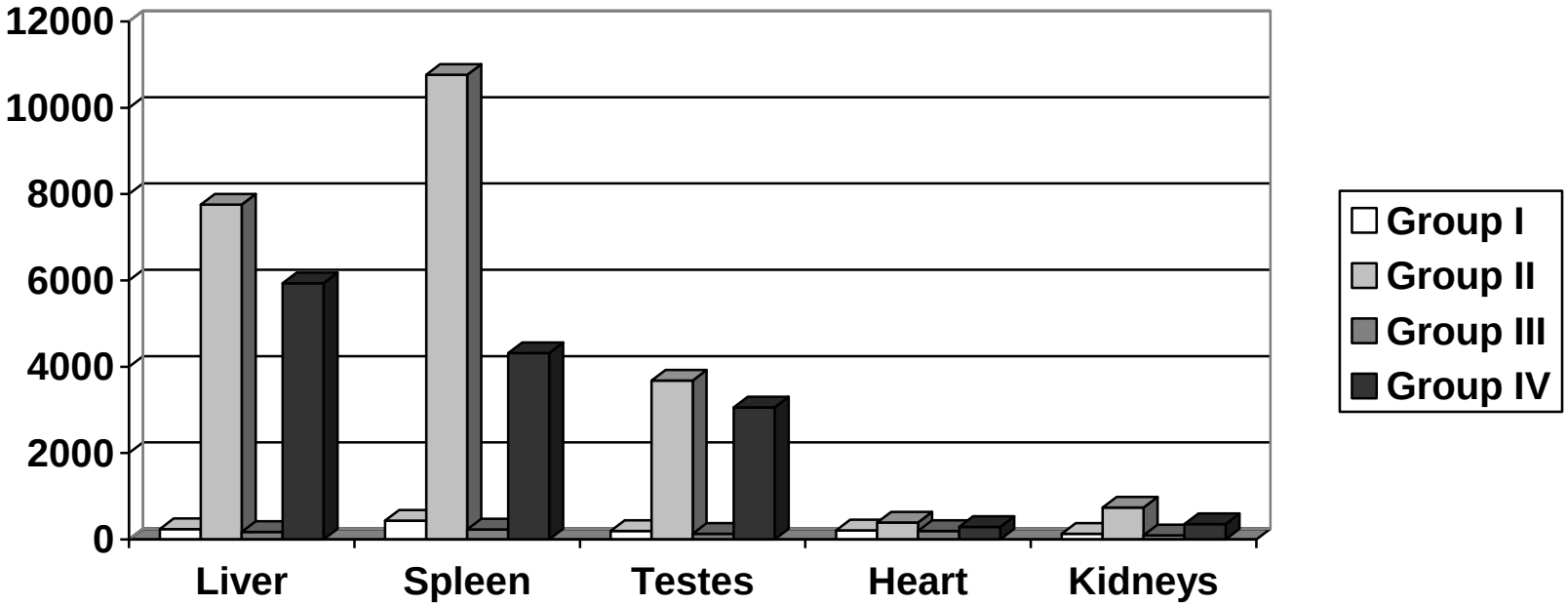


Fig (5): Effect of iron overload (200 mg iron dextran/kg b.wt) and turmeric (1% in diet) on iron concentration of rat liver, spleen, testes, heart and kidneys.

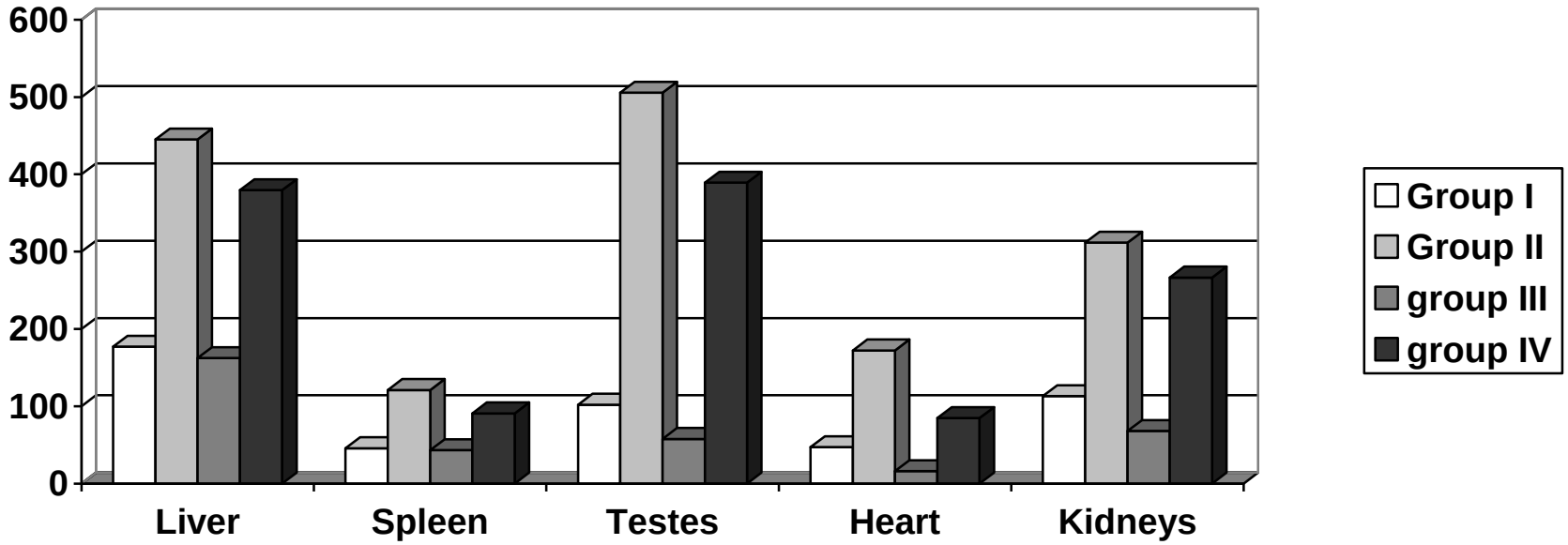


Fig (6): Effect of iron overload (200 mg iron dextran/kg b.wt) and turmeric (1% in diet) on lipid peroxidation of rat liver, spleen, testes, heart and kidneys.

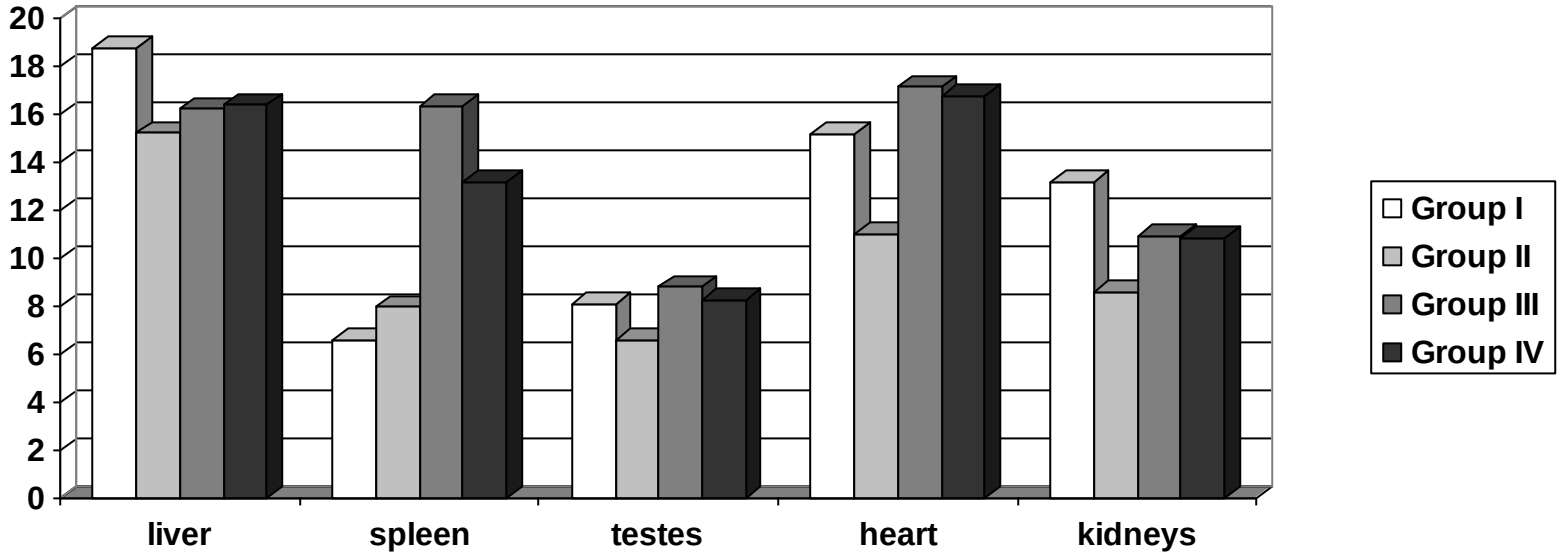


Fig (7): Effect of iron overload (200 mg iron dextran/kg b.wt) and turmeric (1% in diet) on glutathione peroxidase activity of rat liver, spleen, testes, heart and kidneys.

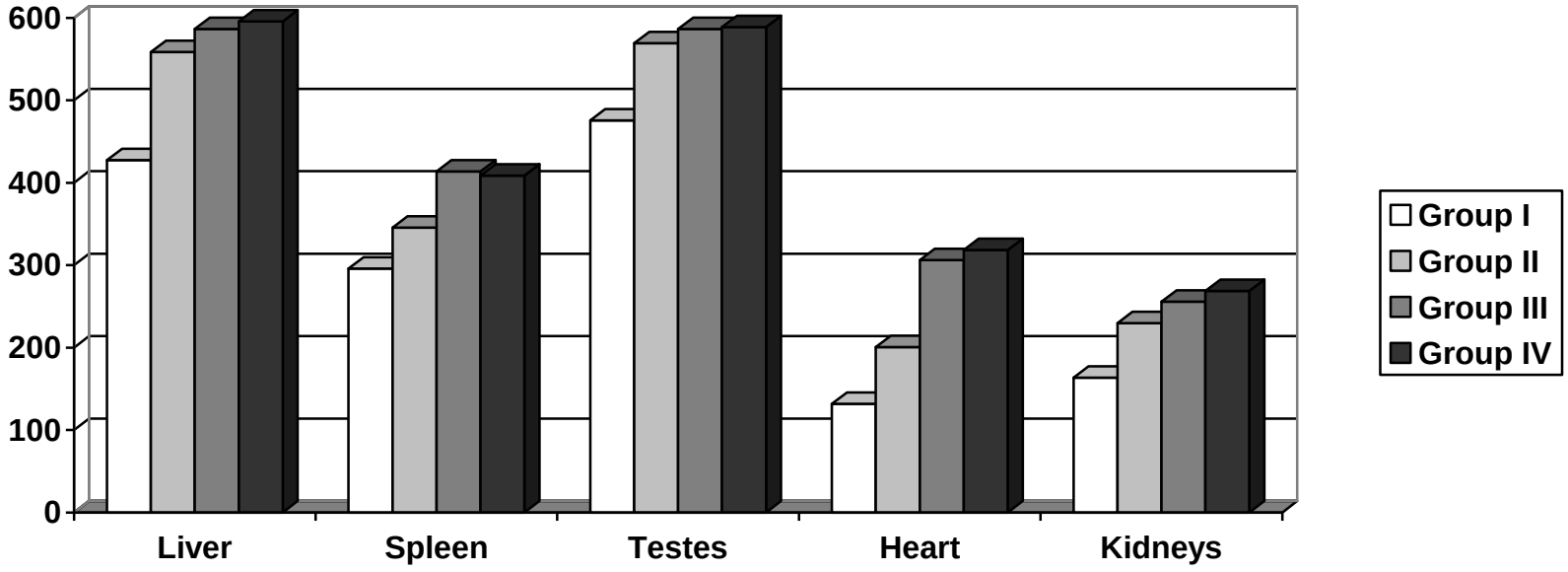


Fig (8): Effect of iron overload (200 mg iron dextran/kg b.wt) and turmeric (1% in diet) on glutathione s-transferase activity of rat liver, spleen, testes, heart and kidneys.

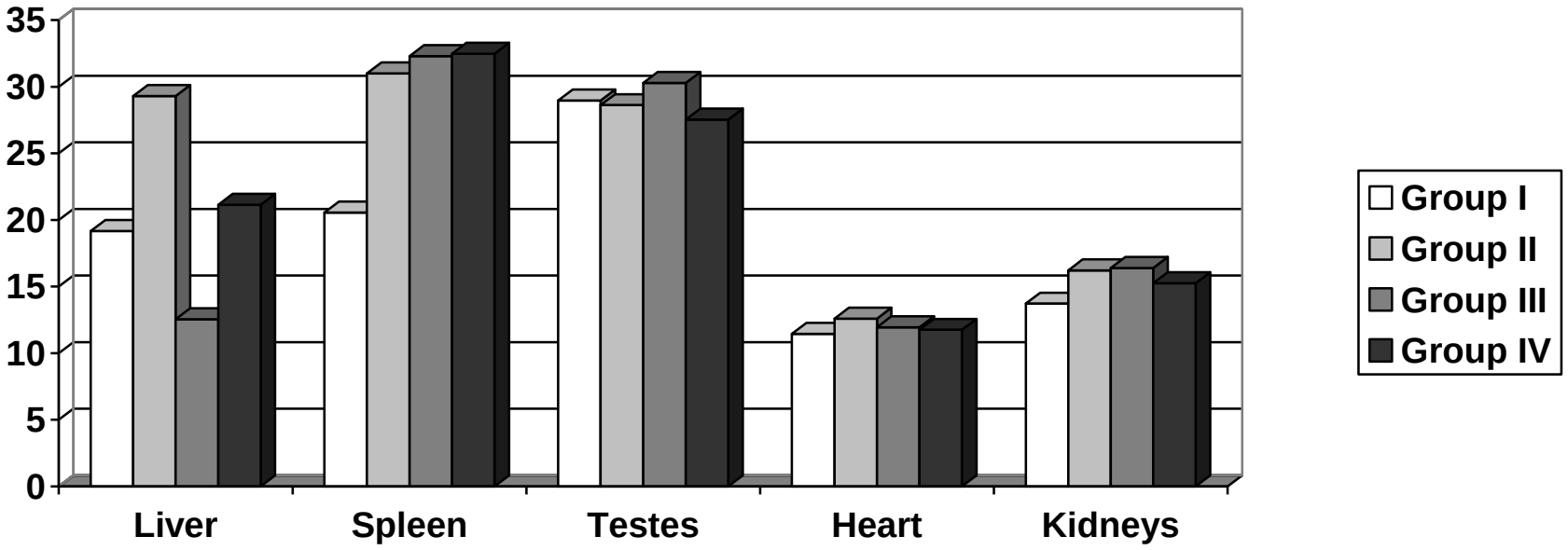


Fig (9): Effect of iron overload (200 mg iron dextran/kg b.wt) and turmeric (1% in diet) on glutathione on rat liver, spleen, testes, heart and kidneys.

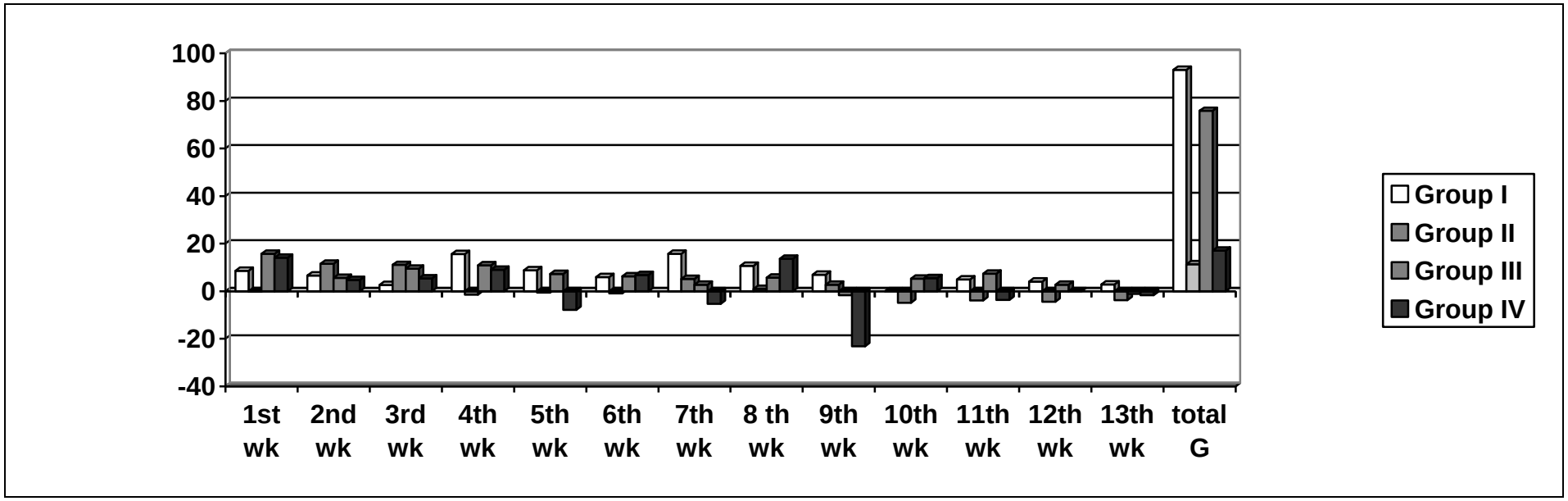


Fig (15): Effect of iron overload (200 mg iron dextran/kg b.wt) and turmeric (1% in diet) on weight gain of rats.

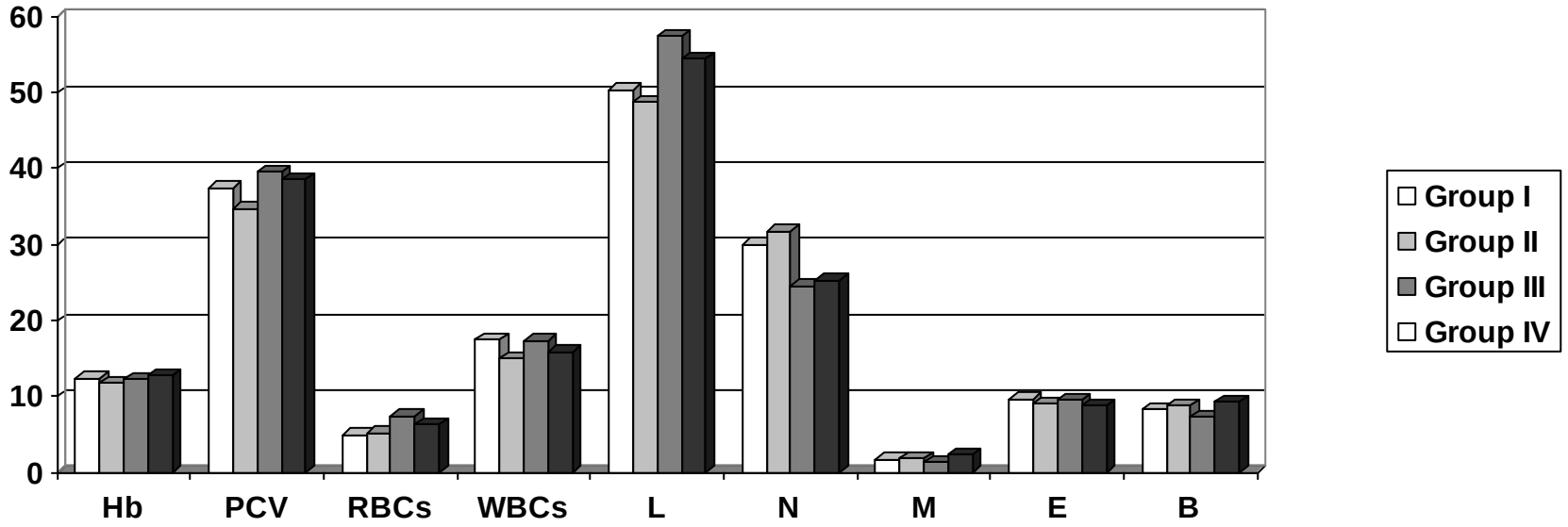


Fig (14): Effect of iron overload (200 mg iron dextran) and turmeric (1% in diet) on blood picture of rats.