

ASSOCIATION OF CASEIN HYDROLYSATE INTAKE WITH CARDIOVASCULAR FUNCTION IN HYPERCHOLESTEROLEMIC FEMALE RATS

Abdraham Abdlelah Abdlhamed and Luma Waleed Khaleel*

Department of Physiology, Biochemistry and Pharmacology, College of Veterinary Medicine, University of Baghdad, Iraq.

*e-mail: waleedluma@yahoo.com

(Received 17 May 2019, Revised 20 July 2019, Accepted 11 August 2019)

ABSTRACT : This study was designed to assess upgraded role of hydrolysate proteins especially casein on hypercholesterolemia that induced by high cholesterol in adult female rats. Twenty-four adult female rats were randomly selected and equally divided into four groups as follows C, G1 and G2. They were treated orally daily for 56 days as follows, C: control group were given (1 ml) distilled water by gavage needle and G1: rats of this group were given (1g/Kg/B.W) cholesterol, G2: rats of this group received cholesterol (1g/Kg/B.W) with casein hydrolysate (1g/Kg/B.W). Fasting blood samples were collected by cardiac puncture technique at (56 day) of the experiment period for measuring the following parameters: Total cholesterol, Triglyceride, troponin, lactate dehydrogenase, creatine kinase and histopathology of heart and Aorta. Results observed a significant increase ($p<0.05$) in total cholesterol (TC), with significant ($p<0.05$) decrease in casein hydrolysate with high cholesterol group (G2) compared with high cholesterol group (G1). In addition results referred that triglyceride in (G2) decreased significantly ($p<0.05$) compared with (G1) group. However, results referred that cardiac markers decreased significantly ($p<0.05$) in casein hydrolysate with high cholesterol. Meanwhile, results showed that cholesterol effects significantly on cardiac cells by causing coagulative increase with fragmented myofibers and hemorrhage with hyper eosinophilic myofibers in (G1) group, compared with casein hydrolysate with high cholesterol (G2) that ameliorates this damaging effect. In conclusion, the results of this study documented that casein hydrolysate is a good hypocholesterolemic milk peptides that amend the mischievous effects of cholesterol in adult female rats.

Key words : Casein hydrolysate, hyper eosinophilic myofibers, hypocholesterolemic milk peptides.

INTRODUCTION

Hyperlipidemia is deemed one of the main risk factors that cause cardiovascular diseases (CVDs). These diseases one third of total deaths around the world, it is believed that CVDs will be the major cause of death and failure throughout the world by the year 2020 (Jorgensen *et al*, 2013; Shattat, 2014). Hyperlipidemia is the status of an increase in lipid content of the body that probably includes the high-rise in one or more of triglycerides, cholesterol, fatty acids and lipoproteins levels (Guo *et al*, 2011; Braamskamp *et al*, 2012).

Lipids are usually present in the bloodstream that are often classified as triglycerides and cholesterol. The cholesterol moves around the blood stream and it is usually contributory in the organization of body cells. It is also contributor in the functioning of cells as well. While the triglycerides, in general, are utilized immediately or is accumulated in the adipose cells (Talath *et al*, 2017). Alteration and/or abnormality in the lipid and lipoproteins metabolism is a very common state that taken place within

general population and it consider as one of the main risk factor in the incidence of CVD due to their effect on atherosclerosis (Hassan, 2013).

Bovine milk is a prime source of proteins of high biological value; it is characterized by a complete amino acids (AA) profile and high digestibility. Apart from their nutritional value, milk proteins and peptides have a wide range of biological functions (Szwajkowska *et al*, 2011). Casein is the major proteinaceous component of milk, where it accounts for about 80% of the total protein inventory. Casein has made us interest due to its numerous using in the food, drug and cosmetic industries in addition to its importance as an investigation material for illustrating essential questions as regards to the protein chemistry (Frisher *et al*, 2011; Wang *et al*, 2002).

Milk proteins like casein are among the most important sources of bioactive peptides; these remain inactive within the sequence of the parent protein until they are released either by gastrointestinal digestion or by food processing (Park and Nam, 2015). Bioactive peptides are specific