Ain Shams University
Faculty Of Education (Abasia Branch)
Home Economics Dept.

Effectiveness Of Some Natural Antioxidants In Restricting The Renal Dysfunction In Rats

Thesis

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Abbreviations

ARF	Acute Renal Failure
BUN	Blood Urea Nitrogen
BW	Body Weight
CRF	Chronic Renal Failure
CDDP	Cis-diammine dichloride platinum II
Cis-platin	Cis-diammine dichloride platinum II
ESRD	End Stage Renal Disease
FER	Food Efficiency Ratio
FI	Food Intake
GFR	Glomerular Filteration Rate
GTE	Green Tea Extract
GTP	Green Tea Polyphenol
HPLC	High Performance Liquid Chromatography
IU	International Unit
Im.	Intramuscularly
Ip.	Intraperitoneally
Iv.	Intravenous
Mg/dl	Miligram per deseliter
PAN	Puromycin Amino Nucleoside
ROS	Reactive Oxygen Species
SPSS	Statistical Package For Social Science
UA	Uric Acid
Wt.	Weight

Approval Sheet

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ABSTRACT

Effectiveness Of Some Natural Antioxidants In Restricting The Renal Dysfunction In Rats.

The present study is carrying out for investigating the effect of supplementation with some natural antioxidant extracts in restricting renal dysfunction in rats. (56) adult male Sprague - Dawley rats (150-200 g) divided to two groups. First group: (8) rats were fed on standard diet (S.D.), as negative control group. Second group: (48) rats were injected intraperitoneal with a single dose of Cis-diammine dichloride platinum II (CDDP) for inducing renal dysfunction (2.5 mg/kg) then it was divided to six subgroups each (8). (1): fed on (S.D.) as positive control group. (2): fed on (S.D.) + Vitamin A (15 mg/kg/day). (3): fed on (S.D.) + Vitamin E (317 I.U./kg/day). (4): fed on (S.D.) + Vitamin C (280 mg/kg/day). (5): fed on (S.D.) + Selenium (0.6 mg/kg/day). (6) fed on (S.D.) + Green Tea Extract (100 mg/kg/day). The experimental period was four weeks, results were statistically analyzed. The results proved that group of nephrotoxicity rats supplemented with Vitamin C showed significant reduction in serum urea nitrogen (57.00%), creatinine (63.04%), uric acid (34.68%), nitric oxide (47.5%), sodium (27.26%) and significant elevation in serum potassium (26.53%) and albumin (84.28%) compared with positive control group. Best results in histopathological examination of kidney were in Selenium group. These results suggest that natural antioxidants could be beneficial as additional therapy in renal dysfunction.

Key Words: Renal Functions, Renal Dysfunction, Nephrotoxicity, Natural Antioxidants and Histopathological Examination.

1. Introduction

The urinary system is the organ system that produces, stores and eliminates urine. In human, it includes two kidneys, two ureters, bladder and urethra. The kidneys are bean shaped organs, which lie in the abdomen. They are about the size of a human fist and surrounding by what is call peri-nephric fat (**Cotran, et al., 2005).** The kidneys are the main organs of the body through which nitrogenous wastes are excrete in the form urea. They are carrying through the blood stream where the blood capillaries coiled up in lakhs of tufts called glomeruli **(Shubhangini, 2001).**

The basic functional unit of the kidneys is the nephron. Most kidney diseases attack the nephrons, causing them to lose their filtering capacity. Damage to the nephrons may happen quickly, often as the result of injury or poisoning. However, most kidney diseases destroy the nephrons slowly and silently. It may take years or even decades for the damage to become apparent. The two most common causes of kidney disease are diabetes and high blood pressure **(Bruce, 2004).** Any disorder in the kidney this sensitive organ results in serious complications of the circulatory system, high blood pressure, anemia (low blood count), weak bones, poor nutritional health, nerve damage and cause complications may not be satisfactory consequences **(Perazella, 2006).**

In addition, kidney disease increases the risk of having heart and blood vessel disease, as well as speed up the death by heart disease. The dangerous of renal diseases is that they may happen slowly over a long period like the silent disease that is exacerbate by moves in the human body without being aware of. These kidney problems are costly in lost work, time and pay, as well as in personal quality of life **(Perazella, 2006).**

A worldwide, the number of patients who receiving renal replacement therapy (RRT) is estimate at more than 1.4 million, with incidence growing by approximately 8% annually. At the year 2025 the kidney failure patients in the world will be 10 million, 70% of them are there in growing countries. In Egypt there are more than 120.000 patient suffering from kidney failure. Driving this increase are population ageing, diabetes mellitus and hypertension, the key risk factors for chronic kidney disease **(Sarah, et al., 2008).**

Diabetes mellitus from more diseases that affect kidney function, because it increases the incidence of chronic kidney disease by 40 to 50%. In Egypt, about 4 million Egyptians are suffering from diabetes. The second reason of kidney diseases in Egyptian society is blood pressure. The studies found that about 26% of Egyptians are suffering from high blood pressure **(Sarah, et al., 2008)**. The specialized researches confirmed that the last ten years in Egypt have shown a significant increase in the number of children living with kidney failure between the ages of 2 - 12 years and has become representing 15% of patients with kidney failure **(Sarah, et al., 2008)**.

Various environmental agents such as (chemical pesticides, solvents and similar materials), animal venom, certain plants and some drugs are nephrotoxic by producing free radicals such as (O_2, RO_2, OH, NO_2, NO) which can cause kidney damage and dysfunction by starting chain reactions that damage cells **(Staci Nix, 2005).**

Antioxidants are molecules capable of slowing or preventing these chain reactions by removing free radicals intermediates and inhibits other oxidation reactions by being oxidize themselves **(Bjelakovic, 2007)**. Moreover, **Saravanan and Nalini, (2007)** demonstrated that treatment with antioxidants offers protection against free radical-mediated oxidative stress in kidney of animals with nephrotoxicity. In addition, **Mohamadin, et al., (2005)** indicated that oxidative stress plays a role in nephrotoxicity and renal dysfunction in rats. Supplementation with antioxidants could be useful in reducing nephrotoxicity in rats.

2. Aim Of The Study

This study is carrying out to investigate the Effect of supplementation with some natural antioxidant extracts in restricting the renal dysfunction in rats through the following parameters:

A- Investigate of some biological evaluations.

B- Investigate of some renal functions.

C- Investigate of some antioxidant levels.

D- Investigate of kidney histopathological.