

The Impacts of Ultra-Slim Plus and Slim Smart on the Morphology of Kidneys and Renal Function of Albino Rats as Weight Reducing Drugs

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ABSTRACT

Aims and objectives: Current study was designed to investigate the effects of two weight reducing drugs i.e. Slim Smart and Ultra-Slim Plus on kidneys and renal function.

Experimental Study: This study was conducted in the Experimental Institute (Animal House) of The University of Lahore, Anatomy departments and Biochemistry department from November 2021 to May 2022. A total 25 adult male albino rat were collected and divided them into three different groups. Plain distilled water, Slim Smart and Ultra Slim plus were used in glass bottles. Under an anatomical microscope, the TA index was used to quantify interstitial fibrosis, glomerular hyalinization, vascular alterations, and tubular atrophy. Cell infiltration was computed as a percentage of inflammatory cells / HPF, and the cortical medulla ratio (C / M) was also calculated. SPSS version 20 was used to gather and analyze the raw data. One-way ANOVA was used to compare groups for quantitative variables such as renal cell infiltration. Group (mean \pm standard) error was used for this analysis. Post-tacky tests were also used for cortical medullary ratios and ($p < 0.05$) was considered important.

Results: Sections of Albino Rate kidney stained with H&E and PAS and examined histologically revealed mesangial cellular hypertrophy, thickened vascular walls, and lymphocyte infiltration. The results of group-A and group-C were significant but in group-B much inflammation was seen. A slightly significant changes ($p < 0.05$) were seen in serum creatinine and blood urea levels in different groups.

Conclusion: Slim Smart and Ultra Slim Plus induce mesangial hyper cellularity and lymphocyte infiltration, as well as thickening of blood vessel walls. These alterations are consistent with interstitial nephritis, thus individuals with renal problems should use these medications with care.

Keywords: Slim Smart, Ultra Slim Plus, Mesangial hyper cellularity, Lymphocyte infiltration, Nephrotoxicity

INTRODUCTION

Obesity is one of the most common nutritional problems in the world and is currently reaching the epidemic rate. This condition was previously thought to be typical of developed countries, but now it is also highly prevalent in developing countries [3]. The World Health Organization (WHO) estimates that in 2019, more than 1.9 billion individuals over the age of 18 were overweight, with more than 650 million of them being obese. Obesity prevalence has risen globally since 1975, severely impacting public health. Numerous comorbidities, including type 2 diabetes, hypertension, dyslipidemia, non-alcoholic fatty liver disease, and cardiovascular disease, are linked to obesity [2]. The WHO also notes that compared to those of normal weight, obese individuals have a 50–150 percent higher chance of dying from any cause [1].

Treatment for overweight and obesity is currently centered on low-calorie diets and exercise regimens. Numerous people turn to dietary supplements that claim to help them lose weight or maintain their weight loss since it can be challenging to attain and maintain good adherence to treatment [4]. Many people find it to be a straightforward option that enables them to maintain their current way of life. These dietary supplements are frequently used for purely cosmetic purposes. Because slimness is a component of the attractiveness that is demanded in our culture today [6].

In the last 30 years, the usage of nutritional supplements and herbal products has increased significantly. They are used by around 80% of people worldwide. A significant concern when utilizing Chinese herbs is safety. By guaranteeing that all herbal medications are secure and of the proper calibre, the responsible regulatory bodies have devised adequate methods to safeguard the public's health [7]. Chinese herbs have been shown in clinical research to be useful in treating obesity. The possible processes of numerous Chinese herbs are starting to be revealed through experimental research. Research has been done so far on a number of natural weight reduction herbs, including *Garcinia cambogia*, a fruit extract that has long been used to treat digestive issues and as an anti-arthritis medication [9].

Aristolochic acid, another herbal substance that has been utilized as a weight-loss aid, has been demonstrated to be nephrotoxic and carcinogenic in both animals and humans [8]. A 2016 study examined the benefits of *Garcinia cambogia* ethanol extract on rats given a high-fat diet in terms of antioxidant and anti-hyperlipidemic activity [10]. In the plasma, kidney, and liver of these rats, there were higher levels of total oxidative state (TOS), higher levels of oxidative stress index (OSI), and lower levels of total oxidative state (TAS). Rats fed *Garcinia* extract experienced decreased plasma cholesterol, triglyceride levels, and increased blood HDL-C and antioxidants [12]. 2014, Lucian Hetal. Potential antioxidant and memory-promoting effects of *Piper nigrum* L. fruit methanol extract in an amyloid beta rat model of Alzheimer's disease.

A rapid deterioration in kidney function brought on by the harmful effects of medications and chemicals is known as nephrotoxicity. There are many different kinds, and some drugs may have various detrimental impacts on renal function [13]. Nephrotoxic compounds are known as nephrotoxins. Nephrotoxicity is caused by a number of different factors, such as crystal nephropathy, renal tubular toxicity, inflammation, glomerular damage, and thrombotic microangiopathy. The traditional markers of nephrotoxicity and renal failure, blood urea and serum creatinine, are viewed as being insufficiently sensitive indicators of early renal injury. There are number of phytochemicals which caused nephrotoxicity [14].

MATERIALS AND METHODS

Study Design: Current study was designed to investigate the effects of two weight reducing drugs i.e. Slim Smart and Ultra-Slim Plus on kidneys.

Experimental Study: This study was conducted in the Experimental Institute (Animal House) of The University of Lahore, Anatomy departments and Biochemistry department from November 2021 to May 2022. A total 25 adult male albino rat were collected and divided them into three different groups.

Materials, Treatment and Time duration: Plain distilled water, Slim Smart and Ultra Slim plus were used in glass bottles.

Microscopic features: Under an anatomical microscope, the TA index was used to quantify interstitial fibrosis, glomerular hyalinization, vascular alterations, and tubular atrophy. Cell infiltration was computed as a percentage of inflammatory cells / HPF, and the cortical medulla ratio (C / M) was also calculated.

Data Analysis Procedure: SPSS 20 was used to gather and analyze the data, One-way ANOVA was used to compare groups for quantitative variables such as renal cell infiltration. Group (mean standard) error was used for this analysis. Post-tacky tests were also used for cortical medullary ratios and (p< 0.05) was considered important.

RESULTS

Table 1: Corticomedullary Ratio in G-A, G-B, G-C

Groups	Treatment	No of Rats	Body weight
Group A	(Control Group)	5	100 gm.
Group B	(Slim Smart Experimental Group)	10	100 gm.
Group C	(Ultra Slim Experimental Group)	10	100 gm.

Table2: Vascular variation in G-A, G-B, G-C

	G-A	G-B	G-C
Present	(0)	05(45.1%)	09(59.2%)
Absent	12(100%)	06(53.8%)	05(29.8%)
Total mice	5 (100%)	10(100%)	10(100%)

Table3: Cellular infiltration in G-A, G-B, G-C

Groups	Treatment	Time duration
Group A	(plain distilled water)	12 weeks
Group B	(Slim Smart + distilled water)	12 weeks
Group C	(Ultra Slim plus + distilled water)	12 weeks

Table4: Mesangial hyper-cellularity

	G-A	G-B	G-C
Absent	12(100%)	(0)	(0)
Mild	(0)	14(100%)	09(59.2%)
Moderate	(0)	(0)	04(29.8%)
Total mice	5(100%)	10(100%)	10(100%)

Table5: Serum Creatinine and Blood Urea levels

Groups	Mean ± SD	Normal range	(P<0.05)
G-A	1.73±0.24	1.26-2.17	0.00
G-B	1.98±0.41	1.37-2.99	0.00
G-C	1.71±0.11	1.26-2.51	0.00

Table 6:

	G-A	G-B	G-C
Present	(0)	04(24.2%)	06(39.7%)
Absent	12(100%)	11(76.9%)	09(61.5%)
Total Rats	5(100%)	10(100%)	10(100%)

Table 7:

Variables	Mean ± SD G-A, mg/dL	Mean ± SD G-B, mg/dL	Mea ± SD G-C, mg/dL
Serum creatinine levels	1.0 ±0.01	1.3±0.03	1.2±0.04
Blood Urea levels	16±0.03	20±0.01	21±0.02
Total Rats	5(100%)	10(100%)	10(100%)

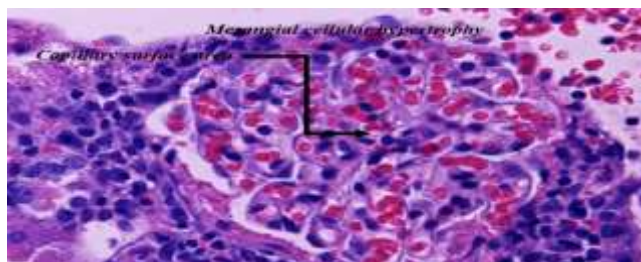


Fig-1

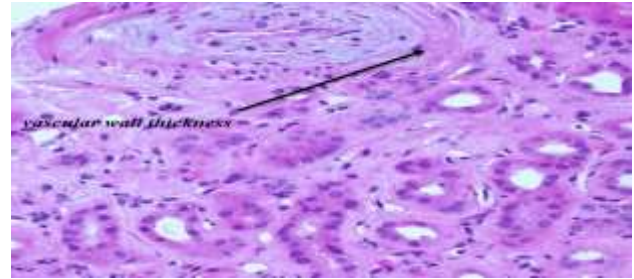


Fig-2

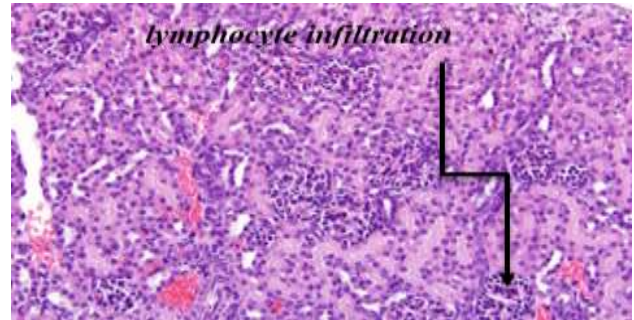


Fig-3

Sections of Albino Rate kidney stained with H&E and PAS and examined histologically revealed mesangial cellular hypertrophy, thickened vascular walls, and lymphocyte infiltration. The results of group-A and group-C were significant but in group-B much inflammation was seen.

DISCUSSION

Different researchers concluded in their studies that there are some phytochemicals which may cause nephrotoxicity in the biological system [8]. Regular use of these medicinal plants for different syndromes without any pharmacological analysis is so harmful for human health. Metabolic complications are developed because of hemostasis changes [10]. Serum creatinine and blood urea directly correlated to the kidney function and different infections or toxic compounds caused medical complications. Mozaffari et al., 2009 conducted research on the impact of chromium picolinate on the kidney and glycemic control of Albino rats that were fat. Kidney sections revealed cystic tubular forms, widespread tubular dilatation, long-term interstitial inflammation, and tubular protein casts [4]. Interstitial fibrosis was concluded in the form of sporadic, patchy foci in a group of rats. The only tubular change or deposit that favors my study is interstitial chronic inflammation, whereas all other tubular changes and deposits are missing in contrast to it.

In current study mesangial hyper cellularity was seen after biopsies investigation in group- B and group-C. But percentage was higher in group-B as compared to group-C. In contrast to experimental group-B, which exhibited modest cellular infiltration, control group-A showed no inflammatory cellular infiltrate. In group-C of the biopsies had moderate infiltration and it had mild infiltration? Inflammatory lymphocytes were present. No vascular alterations occurred in control group-A, however there were changes in the biopsies from experimental group-B and of the biopsies from experimental group-C. Interstitial fibrosis, glomerular hyalinization, and tubular atrophy were mild seen in group-B and group-C respectively.

Biological system absorb chromium, an important mineral, from the food. It used as breaking agent of carbohydrates and lipids[9]. In a study stated that those who have liver or renal illness shouldn't take chromium pollinate. Before using a chromium picolinate dietary supplement, see your doctor if you are on insulin, anti-diabetes medicine, or levothyroxine. The kind of chromium

most frequently encountered in dietary supplements is called chromium picolinate. It could be useful for decreasing blood sugar in diabetics or enhancing the body's reaction to insulin. Additionally, it could lessen cravings, hunger, and binge eating [14].

CONCLUSION

Slim Smart and Ultra Slim Plus induce mesangial hypercellularity and lymphocyte infiltration, as well as thickening of blood vessel walls. These alterations are consistent with interstitial nephritis, thus individuals with renal problems should use these medications with care.

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