

The Effects of Weight Reducing Drugs: Ultra-Slim Plus and Slim Smart on the Morphology of Kidneys of Albino Mice

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ABSTRACT

Aim: To study the effects of weight reducing drugs: ultra-slim plus and slim smart on the morphology of kidneys of albino mice.

Methodology: In this study, 39 adult albino mice were used and were divided in three groups containing 13 animals in each. Group I was control. Group II and Group III were experimental groups and were given 0.5 mg of Slim Smart and Ultra Slim Plus dissolved in 1 ml of distilled water respectively/day for 8 weeks.

Results: Histological examination of sections of kidney stained with H&E and PAS showed mesangial cellular hypertrophy, vascular wall thickness and lymphocyte infiltration. These results were significant in both groups but inflammation was more marked in group II.

Conclusion: Slim Smart and Ultra Slim Plus cause thickening of blood vessel walls along with mesangial hypercellularity with infiltration of lymphocytes. These changes are consistent with interstitial nephritis thus these drugs may be used with caution in patients with kidney diseases.

Key words: Albino mice, Weight reducing drugs, kidneys

INTRODUCTION

Herbal products and supplements have been used extremely for the last three decades. Almost 80% of people throughout the world are using them. Safety is to be a main issue with the use of herbal medications. The related regulatory departments establish suitable methods to safeguard public health by warranting all herbal drugs as harmless and of appropriate quality.¹ Clinical investigations of herbal medicines have been proved to be effective in the management of obesity. Experimental studies have begun to reveal the potential mechanisms of the various herbal medicines². So far research has been done on few natural weight reducing herbs containing Garcinia Cambogia, a fruit extract that has been long used as an anti-arthritis pill and moreover for curing digestive problems³. Another herbal product, Aristolochic acid is used as a weight decreasing agent and has been proved to be carcinogenic and nephrotoxic in both animals and humans⁴.

In 2016, Sripradha et al⁵ carried out a study on antioxidant and antihyperlipidemic effects of the ethanolic extract of Garcinia Cambogia on rats fed on high fat diet. In these rats, there was rise in total oxidant status (TOS), oxidative stress index (OSI) and decrease in the total antioxidant status (TAS), witnessed in plasma, kidney and liver. The rats which were given garcinia extract, there is decrease in plasma cholesterol, triglycerides levels and increase in HDL-C and blood antioxidants. In 2014, Lucian H et al analyzed the probable antioxidant and memory enhancing properties of the methanolic extract of Piper nigrum L. fruits in amyloid beta rat model of Alzheimer's disease⁵.

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METHODOLOGY

This involved to study effects of two drugs i.e. Slim Smart and ultra-slim plus. This Experimental study was carried out in Experimental Research Laboratory (Animal House) university of Veterinary and Animal Sciences Lahore and Histology Laboratory of Anatomy Department, King Edward Medical University Lahore. A total of 39 adult male albino mice were taken. 13 mice were randomly allocated to each group i.e.

- Group I (Control Group)
- Group II (Experimental group with slim smart)
- Group III (Experimental group with ultra slim)

Sampling technique: Simple random sampling technique Healthy adult male albino mice were selected and were weighed using a digital weighing machine. Animals were kept in Pharmacology Department of UVAS, Lahore under controlled conditions.

Grouping:

- Group I (Plain distilled water),
- Group II (Drug i.e. Slim Smart)
- Group III (Drug i.e. Ultra Slim plus).

Calculation of corticomedullary ratio: Kidney specimens were fixed in 10% formalin for 24 hours. Kidneys were cut longitudinally and the cortex (the outer area) and the medulla (the inner area) were identified. Each half of the kidney was then observed under the dissecting microscope for calculation of corticomedullary ratio.

Microscopic features: Interstitial fibrosis, Hyalinization of glomeruli, vascular changes.

Tubular atrophy was measured through TA index, Cellular Infiltration was calculated as percentage of inflammatory cells/HPF, corticomedullary ratio (C/M) was calculated under the dissection microscope.

Data analysis procedure: Data was collected and analyzed by using SPSS version 20. Quantitative variables such as cellular infiltration in kidney was analyzed by using mean ± SD for groups and comparison among groups was made by using one-way ANOVA. Post hoc Tuckey's test was also applied for corticomedullary ratio and P value < 0.05 was considered significant.

RESULTS

The detail of results is given in tables 1,2, 3, 4

Table 1: Corticomedullary ratio in different groups

	Group I	Group II	Group III
Mean ± SD	1.75±0.35	1.97±0.52	1.60±0.42
Ranges	1.25---2.17	1.38---3.0	1.0---2.5
Total mice	13	13	13

I vs II p>0.05 (NS), I vs III p>0.05 (NS),
 II vs III p>0.05 (NS), Group I= Control group,
 Group II= With slim smart drug, Group = With ultra slim drug

Table 2: Vascular changes

	I	II	III
Present	zero	03(23.1%)	05(38.5%)
Absent	13(100%)	10(76.9%)	08(61.5%)
Total mice	13(100%)	13(100%)	13(100%)

I vs II p<0.01 (HS), I vs III p<0.01 (HS),
 II vs III p<0.05 (S)

Table3: Cellular infiltration

	I	II	III
Absent	13(100%)	Zero	Zero
Mild	Zero	13(100%)	09(69.2%)
Moderate	Zero	Zero	04(30.8%)
Total mice	13(100%)	13(100%)	13(100%)

I vs II p<0.01 (HS), I vs III p<0.01 (HS),
 II vs III p<0.05 (S)

Table4: Mesangial hypercellularity

	I	II	III
Present	Zero	06(46.2%)	04(30.8%)
Absent	13(100%)	07(53.8%)	09(69.2%)
Total mice	13(100%)	13(100%)	13(100%)

I vs II p<0.01 (HS), I vs III p<0.01 (HS),
 II vs III p>0.05 (NS)

DISCUSSION

In this study, mesangial hypercellularity was found in 6(46.2%) biopsies of group II and 4(30.8%) of group III, while absent in all 13 animals of group I. There was no Inflammatory Cellular infiltrate in control group I, while 13(100%) of experimental group II had mild cellular infiltration. In group III, 9(69.2%) biopsies were with mild and 4(30.8%) with moderate infiltration. The inflammatory cells were lymphocytes. There was no vascular change in control group I, while there were vascular changes in 3(23.1%) biopsies of experimental Group II and 5(38.5%) in experimental group III. Interstitial fibrosis and Hyalinization of glomeruli along with tubular atrophy were absent in all three groups.

Benzakour G⁷ in 2011 on Aristocholic acid studied the herb used for weight reduction, in which different concentrations of aristocholic acid were given to mice. Lymphocyte infiltration and glomerular lesions such as mesangial hypercellularity were observed in histological sections. They also reported tubular necrosis and atrophy along with slight interstitial fibrosis. The reason for this may be due to different ingredients and these drugs were given only for 8 weeks. In the same study, it has been reported that longer duration of exposure to aristocholic acid lead to more changes.

Mozaffari MS⁸ studied on the effects of chromium picolinate on glycemic control and kidney of the obese Zucker rats in 2009. Sections of kidneys showed tubular protein casts, diffuse tubular dilation, interstitial chronic inflammation and cystic tubular formations. Mice in one of the groups showed scattered patchy foci of interstitial fibrosis. Only interstitial chronic inflammation favores my study whereas all other tubular changes and deposits were absent in contrast to this study.

CONCLUSION

Slim Smart and Ultra Slim Plus cause thickening of blood vessel walls along with mesangial hypercellularity with infiltration of lymphocytes. These changes are consistent with interstitial nephritis thus these drugs may be used with caution in patients with kidney diseases.

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