World Journal of Clinical Pharmacology, Microbiology and Toxicology
World J. Clin. Pharmacol. Microbiol.Toxicol.
Vol. 1 [1] May 2015; 52-54

URL: http//wjcpmt.com

ORIGINAL ARTICLE

Effect of Seed Extract of *Amomum cardamomum* on Renal Function in Alloxan Induced Diabetic Rats

Deepmala Verma, Rajesh Yadav and **Manish Kumar
Department of Environment Science, SS Jain Subodh PG College,Jaipur
**Academy for Environment and Life Sciences, Agra
Email: manishzoology06@yahoo.com

ABSTRACT
The present work was undertaken to investigation, the effect of ethanolic seed extract of Amomum cardamomum on blood urea nitrogen, creatinine, and uric acid in alloxan induced diabetic rats. Ethanolic seed extract of Amomum cardamomum was administered orally (50 mg/kg body weight) for 7,15,30,45 and 60 days. Treatment with Amomum cardamomum resulted in significant reduction of serum urea ($p<0.001$), creatinine ($p<0.001$) and uric acid ($p<0.001$); while increment in serum total protein ($p<0.001$) and comparable with that of alloxan induced diabetic rats and control groups. The results clearly show, the decreased urea, creatinine, uric acid and improvement in serum protein activity with the treatments have been attributed to improve renal function.
Keywords: Diabetes Mellitus, Renal Function

INTRODUCTION

Diabetic nephropathy is mainly associated with excess urinary albumin excretion, abnormal renalfunction as represented by an abnormality in serum creatinine. The common progression from microalbuminuria to overt nephropathy has led many to consider microalbuminuria to define early or incipient nephropathy. Renal disease is suspected to be secondary to diabetes in the clinical setting of long-standing diabetes. Clinically, diabetic nephropathy is characterized by a progressive increase in proteinuria and decline in GFR, hypertension, and a high risk of cardiovascular morbidity and mortalit(Dosseter,1966 and Kassirer, 1971) . Cardamom is the dried, unripened fruit of the perennial *Amomum cardamomum*. Enclosed in the fruit pods are tiny, brown, aromatic seeds, which are both pungent and sweet to the taste. Cardamom pods are generally green but are also available in bleached white pod form. It is available both in the whole pod and as decorticated seeds with the outer hull removed. The spice known as cardamom is the fruit of several plants of the *Elettaria*, *Aframomum* and *Amomum* genera in Zingiberaceae, or ginger family. Cardamom is used both as a spice and as medicine, and used as an ingredient in several traditional medicines in China, India, Korea and Vietnam. Cardamom has been used traditionally for a variety of conditions including as a digestive, carminative, stimulant, breath freshener and aphrodisiac. Current research has implicated cardamom's potential therapeutic value as an inhibitor of human platelet aggregation (Mukherjee,1981). The purpose of the present work was conducted to examine the renoprotective effect *A. cardamomum* on the renal function in alloxan induced diabetic male albino rats.

MATERIALS AND METHODS

Experimental animals: Thirty five male albino rats were acclimatized for two month prior to experiment. Healthy and adult male rats of almost equal size and weight ranging from 100-120g were kept in polypropylene cages measuring 90x60x30 cms at temperature 27±5ºC, relative humidity 65±10% and photoperiod 12 hrs /day. The rats were fed on Gold Molar brand ret feed manufactured by Lipton India Ltd. Mumbai and water was provided *ad libitum.*

Plant material and Extract: The seed of the *Amomum cardamomum* was purchased from local market, Agra. The 100 g of bark was extracted with 500 ml of ethanol and kept in magnetic stirrer for 48 hours at room temperature. After it the solution was filtered by Whatmann no.1 filter paper and kept in lyophilizer for 48 hours and obtain material was stored at room temperature (25^0C). The residue was

re-extracted with distilled water for experiments.

Dosage regimen: The dose for the entire research was 50 mg/kg body weight given to experimental rats. The doses were given once in a day for 7, 15, 30, 45 and 60 days respectively.

Induction of diabetes: The acclimatized animals were kept fasting for 24 h with water ad libitum and injected intraperitoneally a dose of 150 mg/kg of alloxan monohydrate in normal saline (Joy and Kuttan, 1999). After one hour, the animals were provided feed *ad libitum.*

Experimental protocol: All the rats were divided in to six groups of five rats each.

1. **Control Group-I:** Control groups provide normal saline (1 ml/kg b.wt.).
2. **Diabetic Groups-II:** The second group alloxan induced diabetic rats.
3. **Treatment Groups**: Third groups treated with 50 mg/ kg b.wt. of ethanol seed extract of *Amomum cardamomum.*

Serum separation : After the conclusion of experiment, the animals were subjected to overnight fasting and killed under mild anesthesia. Blood was withdrawn from retro-orbital sinus using glass capillary in plain vials. The blood was centrifuged and the serum was separated for biochemical profile.

Biochemical analysis: Blood urea nitrogen was determined by Talke and Schubert, (1979), creatinine (Bartels, *et al.*1972), serum uric acid (Morin and Prox, 1973) and Serum total protein was estimated by folin's reagents method (Lowery, *et al*. 1951).

Statistical analysis: All results are expressed as Mean ± S.Em. (Standard error of mean) for a given number of observations (n). Groups of Data were compared statistically using Dunnett's multiple comparison test (DMCT) and performed calculation by KpKy plot (ver.3.0) computer statistical software. Results were considered significantly at ($p<0.05$).

RESULTS AND DISCUSSION

The results of Table 1 reveals that the extract produced significant decrease in the blood urea nitrogen (BUN) ($p<0.001$), creatinine $p<0.001$) and uric acid($p<0.001$); while increment in serum total protein ($p<0.001$) level when compared with the controls in alloxan induced hyperglycemic rats in the single dose experiment.

Table.1- Effect of *A. cardamomum* on renal function test in alloxan induced diabetic rats

Renal profile	Control groups	Diabetic groups	Treatment groups(*A. cardamomum* 50 mg/kg body weight)				
			7 days	15 days	30 days	45 days	60 days
Blood urea nitrogen (mg/dl)	10.4±0.57	20.2±0.84	19.1±0.76ns	16.2±0.65*	14.6±0.88**	13.2±0.54***	11.5±0.58***
Uric acid (mg/dl)	2.6±0.13	6.0±0.30	.9±0.23ns	5.6±0.45*	4.4±0.22**	4.0±0.18**	3.1±0.19***
Creatinine (mg/dl)	0.78±0.006	1.57±0.016	1.45±0.010ns	1.20±0.012*	0.98±0.009*	0.85±0.010***	0.80±0.008***
Total protein (g/dl)	5.43±0.13	2.45±0.21	3.21±0.14*	4.09±0.22**	4.25±0.15**	4.78±0.20***	5.12±0.18***

Values are given in Mean± S.Em (standard error of mean); no. of observations (5)
ns- no-significant ($p>0.05$); while * significant ($p<0.05$), highly significant ($p<0.01$) and very highly significant ($p<0.001$)

Diabetic nephropathy is mainly associated with excess urinary albumin excretion, abnormal renal function as represented by an abnormality in serum creatinine Annapurna, *et al.*2001). In the present study, the significant reduction in blood urea nitrogen, uric acid and serum creatinine after beneficial effect of alcoholic seed extract of *A. cardamomum* in alloxan induced diabetic rats due to improvement on glomerular function of kidney and maintained positive nitrogen balance (Sabu and Kuttan, 2002). Similar findings have been reported by Rao and Nammi (2006) in rats antidiabetic and renoprotective effects of the chloroform extract of *Terminalia chebula* rats. seeds in streptozotocin-induced diabetic rats. In the present study, total protein increased after oral administration of alcoholic seed extracts of *A. cardamomum* due to stimulation of number of m -RNA molecule the attachment with ribosome (Rao, and Nammi, 2006). Similar mechanism have also been reported by Joy and Kuttan(1999) in diabetic rats the anabolic action of *Picrorrihza kurroa* on protein metabolism. Therefore, the decreased urea, creatinine, uric acid and improvement in serum protein activity with the treatments have been attributed to improve renal function. We concluded that the *A. cardamomum* is more effectively inhibited the

incidence of diabetic nephropathy and stimulate protein biosynthesis

REFERENCES

1. Joy, K.L. and Kuttan, R. 1999. Antidiabetic activity of *Picrorrhiza kurroa* extract. J. Ethnopharmacol. 67: 143-148
2. Bartels H, Bohmer, M. and Heieri, C. 1972. Serum creatinine determination without protein precipitation. Clin Chem Acta, 37:193-196.
3. Lowry, O.H, Rosebrough N.J., Farr, A. and Randall, R.1951. Protein determination with the Folin's reagent. J. Biol. Chem., 195:133-140.
4. Dosseter, J.B.1966.Creatininemia versus uremia. Ann. Intern. Med., 63:1287-1299.
5. Kassirer, J.P.1971.Clinical evaluation of kidney function. Kidney Int.23:102-122.
6. Morin, L.G. and Prox, J. 1973. Reduction of ferric phenanthroline-a procedure for determining serum uric acid. Am. J. Clin. Path., 60(5): 691-694.
7. Talke, H. and Schubert, G.E. 1979. Estimation of urea and blood urea nitrogen in the serum and urine by ultra visually method. Klin. Woshchschr., 19: 43-174.
8. Annapurna, A, Kumar, V.K., Rao, N.K., Harish, G. and Kumar, K.V. 2001. Diabetic nephropathy. Ind. J .Pharm. Sci., 63:273-278.
9. Sabu, M.C. and Kuttan, R. 2002. Antidiabetic activity of medicinal plants and its relationship with their antioxidant properties. J. Ethnopharmacol. 81:155-160.
10. Mukherjee, S.K.1981. Indigenous drugs in diabetes mellitus. J. Diabet. Assoc. Ind, 21:97-106.
11. Rao, N. K and Nammi, S.2006.Antidiabetic and renoprotective effects of the chloroform extract of *Terminalia chebula* Retz seeds in streptozotocin-induced diabetic rats. BMC Comp.Med.6:17-24

CONFLICT OF INTEREST : Nil
Received : 12.03.2015
Accepted : 28.04.2015

CITATION OF THIS ARTICLE

Deepmala V, Rajesh Y and Manish K. Effect of Seed Extract of *Amomum cardamomum* on Renal Function in Alloxan Induced Diabetic Rat. World J. Clin. Pharmacol. Microbiol.Toxicol. Vol 1 [1] May 2015. 52-54