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Original Research Article

Comparison of Hypoglycemic Effects of *Coscinium fensestratum* colebr Bark and Stem in Normal Rats

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Abstract: This present study was conducted to evaluate the hypoglycemic effect of aqueous extract of stem and bark of *Coscinium fensestratum* colebr in normal rats.Total 18 rats were selected and divided into the three groups each of 6 rats. G-I given 1% gum acacia, G-II given aqueous extract of C.F stem (500 mg/kg) and G-III treated with aqueous extract of C.F bark (500 mg/kg). Test drugs were given single dose to their respective groups. Fasting and IPGTT (30, 60 and 120 min) blood was collected and serum was separated. The collected serum was used for estimation of glucose. Aqueous extract of stem showed significant decrease in glucose levels at 30, 60 and 120 min of IPGTT compared to control and bark extract. Rats treated with aqueous extracts of bark and stem showed significant decreased glucose levels compared to control group. Aqueous extract of *Coscinium fensestratum* colebr stem showed significant hypoglycemic effect than bark. Further studies required to isolate the phytochemicals having hypoglycemic effect in the extract.
Keywords: Aqueous extract, Bark, *Coscinium fensestratum* colebr, hypoglycemia, IPGTT, stem.

INTRODUCTION

According to the World Health Organization (WHO) the prevalence of diabetes mellitus (DM) has increased in the past few years and is expected to double by the year 2025 [1]. In Ayurvedic medicine is reported to have been used in the treatment of DM [2]. Several synthetic drugs are available to treat DM. But these drugs cause various adverse effects. In recommendations of WHO expert committee on DM suggested that there is a requirement of investigation of plant for the treatment of DM [3]. In India many herbs reported for their anti-diabetic activity. Still there is a requirement of screening of plants to evaluate the hypoglycemic effect [4]. According to Ayurveda *Coscinium fensestratum* colebr (C.F) bark and stem have hypoglycemic effect. With this reference present study was conducted to evaluate the hypoglycemic effect of C.F in normal rats.

MATERIALS AND METHODS

Animals

Male Wistar Albino rats (200-250gm) were selected for the study. Total 18 rats were divided in to three groups each of 6 rats. All the rats were kept in Central Animal House. They were fed on standard rat feed and given tap water ad libitum [5]. This study was approved by Institutional Animal Ethics Committee, Government Madurai Medical College, Madurai, and Tamil Nadu. The study was conducted according to the GCP and CPCSEA guide lines.

Collection of plant materials

C.F Colebr bark and stem was collected from local area of Madurai, Tamil Nadu. Collected plant was cleaned and used for the extraction.

Preparation of aqueous extract of *Coscinium fensestratum* colebr bark powder

C.F bark was collected and cleaned, made into fine powder by using domestic grinder. The powder was used for aqueous extraction. Sufficient amount of bark powder was soaked in water in round bottomed flask for 24 hours. After 24 hours the solute was filtered. The filtrate was evaporated to dryness and the final dark brown colored extract was obtained. The extract was stored and used for the study [6].

Preparation of aqueous extract of *Coscinium fensestratum* colebr stem

C.F stem powder was weighed and soaked in a round bottomed flask. 300ml of distilled water was added and refluxed for about 24 hours. After 24 hours the solution was filtered and the filtrate was evaporated to dryness and the final extract was obtained. The extract was stored and used for the study [7].

Study groups

Group-I: Gum acacia (1% 10 ml/kg)
Group-II: Aqueous extract of C.F stem (500 mg/kg)
Group-III: Aqueous extract of C.F bark (500 mg/kg)

Experimental procedure

All the groups' rats were kept for overnight fasting. Fasting blood was collected. After collection of blood, rats given test drugs to their respective groups. 30 min later rats were given glucose (2gm/kg/i.p). Blood samples were collected at 30, 60 and 120 min during IPGTT. Blood was centrifuged and serum was separated. Collected serum was used for the estimation of glucose levels by oxidation peroxidation method [8].

STATISTICAL ANALYSIS

Glucose levels were expressed in MEAN±SEM. The data was analyzed by Statistical Analysis of Social Sciences (SPSS 16.0 version). One way ANOVA (Posthoc) followed by Dunnet t test used for find the statistical significant between the groups. p values less than 0.05 ($p<0.05$) considered statistically significant.

RESULTS

Control group showed significant increase in glucose levels compared to C.F stem and bark extract at 30, 60 and 120 min of IPGTT. C.F stem given rats showed significant hypoglycemia compare to bark extract at all the time periods of IPGTT.

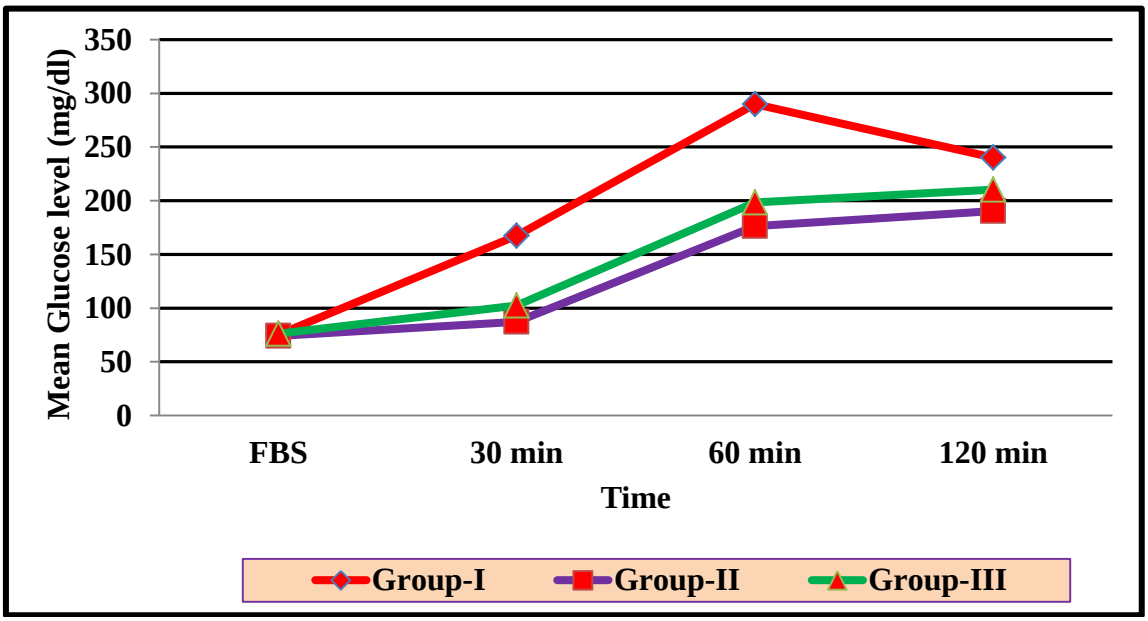

Fig 1: Hypoglycemic effect of aqueous extract of C.S stems and barks on normal rats

DISCUSSION

Coscinium fensestratum colebr commonly known as "tree turmeric" is widely distributed in Western Ghats of India. Stem and bark of this plant is bitter and widely used in the treatment of inflammation, ulcer, infections, tonic, wounds, skin diseases, liver disorder, fever, hyperglycemia and immunomodulation [9, 10]. Previous studies have reported that the C.F stem showed anti-diabetic activity in rats [11]. In the present study hypoglycemic effect of C.F stem and bark was studied in normal rats. Rats treated with extract showed low glucose levels compared to control group. This effect of extract may be due to stimulation of glucose uptake by liver, muscle and fat cells or increased insulin release. Phytochemical analysis of extract showed presence of berberine, steroids, alcohol component, sitosterol and saponins. These agents may be responsible for hypoglycemic effect of plant extract [12]. This study results explains phytochemicals present in the extract may act like insulin or oral hypoglycemic drugs and reduced the glucose levels.

CONCLUSION

Aqueous extract of C.F stem given rats showed hypoglycemic effect. Further studies required to isolate the phytochemicals having hypoglycemic effect.

REFERENCES

1. Eliziane N, Nestpor AS, Lydia MF; Experimental model of induction of diabetes mellitus in rats. Acta Cir Bras 2003; 18: 60-65.

2. Rai MC; A review on some hypoglycemic plants in India. Ancient Sci Life 1994; 14: 42-54.
3. The WHO expert committee on Diabetes mellitus. Technical report series 646. Geneva. World Health Organization 1980.
4. Nadkarni KM; Indian Materia Medica. 3rd edition. Mumbi, Popular Prakashan; 1982; 1236-7.
5. Syed MA, Vrushabendra Swamy BM, Gopkumar D, Chandrashekara VM; Anti-diabetic activity of Terminalia catappa Linn. Leaf extracts in alloan induced diabetic rats. IJPT 2005; 4(1): 35-39.
6. Rajesh Kumar G, Achyut narayan K, Geeta W, Murthy PS, Ramesh Changdra, Kapil M, *et al.;* Hypoglycemic and anti-diabetic effect of aqueous extracts of leaves of Annona squamosa (L.) in experimental animal. Current Science 2005; 88(8): 1244-1254.
7. Mahomed IM, Ojewolw JA; Hypoglycemic effect of Hypoxis hemerocallidea corm (African potato) aqueous extract in rats. Exp Clin Pharmacol 2003; 25(8): 617-623.
8. Babu V, Gangadevi T, Subramoniam A; Antidiabetic activity of ethanol extract of Cassia kleinii leaf in streptozotocin induced diabetic rats and isolation of an active fraction and toxicity evaluation of the extract. IJP 2003; 35: 290-296.
9. Aher NB, Pal SC, Saudagar RB; Evaluation of immunomodulatory activity of ethanolic extract of stem bark of Coscinium fenestratum (Gaertn.) Colebr. IJPPR 2015; 3(2): 1-11.
10. Venukumar MR, Latha MS; Effect of Coscinium fenestratum on hepatotoxicity in rats. Ind J Expt Biol 2004; 42: 792-797.
11. Shiwaikar A, Rajendran K, Punitha ISR; Anti-diabetic activity of alcoholic stem extract of Coscinium fenestratum in streptozotocin-nicotinamide induce type 2 diabetic rats. J Ethanopharmacol 2005; 97: 369-374.
12. Joharapurkar AA, Wanjari MM, Diit PV, Zambad SP, Umathe SN; Pyrogallol. A novel tool for screening immunomodulators. Ind J pharmacol 1994; 42: 31-37.