

Research on Antidiabetic Herbal Preparation of GK Pharma (Unani) Limited has been accepted in the International Diabetic Federation Congress 2017.

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Stream **Abstract - Basic and Clinical Science**

Topic **Oral glucose-lowering therapies**

Abstract title **Hypoglycemic and antioxidant activities of some antidiabetic herbal preparations available in Bangladesh**

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Abstract body **Background**

Diabetic Mellitus has turned to be a menace to public health because of unavailability of adequate drugs to manage this disorder. A scientific investigation of traditional antidiabetic herbal medicine may provide valuable leads for the development of alternative drugs.

Aim

The present study was undertaken to evaluate the hypoglycemic (in type 2 diabetic model rats) and antioxidant properties of five antidiabetic herbal preparations manufactured locally and readily available in Bangladesh.

Method

Five Antidiabetic Herbal Preparations (ADHPs) (ADHP-1 Sijijium Jamb; ADHP-2 Syp ABC-3; **ADHP-3 Cap Dicure**; ADHP-4 Tab Alisa Garlitab and ADHP-5 Tab Ziabit) produced by different local herbal pharmaceutical companies, were collected from shops in Dhaka city. Long Evans rats were bred at animal house in Bangladesh University of Health Sciences (BUHS). Type 2 diabetes was induced by a single ip injection of STZ to 48 hours old pups bred at BUHS animal house 3 months later after confirming with an OGTT Type 2 rats were selected for experiment. All of the ADHPs at a dose of 2.5 g/kg bw were fed orally to type 2 model rats for 4 weeks with a single feeding daily. Blood samples were collected on 0 day and 14th day by cutting the tail tip and on 28th day by decapitation of rats. Serum fasting glucose, lipid profiles, insulin and liver glycogen content were measured by GOD-PAP, enzymatic colorimetric, ELISA and Anthrone-sulphuric acid method respectively; LDL level was calculated by Friedewald formula. The Methanol extracts of ADHPs were screened for total phenolic, flavonoids and tannin contents. ADHPs were also screened for free radical scavenging activity by using ABTS [2,2'-azinobis-(3-ethylbenzothiazoline-6-sulfonic acid)]. Data were analyzed by univariate and multivariate tools.

Results

Among all the 5 ADHPs tested only 2 were found to be effective in terms of glucose lowering effect. Treatment with ADHP-2 & 3 showed significant reduction in serum glucose on 28th day (mmol/L, M \pm SD; 0 day vs 28 day, 8.64 \pm 0.83 vs 7.48 \pm 1.27, p=0.029; ADHP-2) (8.53 \pm 0.98 vs: 6.49 \pm 0.79, p=0.001, ADHP-3). Glibenclamide treatment group also significantly reduced the blood glucose level on 14th day and 28th day when it was compared to 0 day value (mmol/L, M \pm SD; 0 day vs 14 day, 8.05 \pm 0.62 vs 7.02 \pm 1.02, p<0.05 and 0 day vs 28 day, 8.05 \pm 0.62 vs: 6.77 \pm 1.52, p<0.025), respectively. Other ADHPs (ADHP-1, 4 & 5) did not show any significant blood glucose lowering effect. Fasting serum insulin levels were increased by 30% and 63% in ADHP-2 & 3 treated groups respectively on 28th day in comparison to baseline value. ADHP-1 decreased triglyceride level significantly (mg/dl, M \pm SD; 0 day vs 28 day, 80 \pm 11 vs 61 \pm 7, p=0.014). LDL-C level decreased by 8% and 9% by the treatment of ADHP-2 & 3 group on final day. Liver glycogen content was increased by 5%, 57%, 45%, 27% and 9% after 28th days by the corresponding treatment with ADHPs-1, 2, 3, 4 & 5. Results of the phytochemical analysis revealed that phenolic content was highest in ADHP-1 (591.21 \pm 0.15 mg/g) compared to gallic acid (518.52 \pm 0.16 mg/g) equivalent, high amount of total flavonoid content was observed in ADHP-2 (27.39 \pm 0.17 mg), and in ADHP-3 (30.67 \pm 0.13 mg/g) compared to 30.67 \pm 0.13 mg/g of quercetin. The total tannin content was highest in ADHP-1(40.10 \pm 0.13 mg/g) compared to 26.0 \pm 0.16 mg/g of tannic acid, equivalent. ADHP-1, 3 & 4 showed significant ABTS free radical scavenging activity (98.38 \pm 0.01, 96.03 \pm 0.01 & 96.93 \pm 0.02 %) in 400 ppm concentrations, respectively in comparison to the standard ascorbic acid 99.9 \pm 0.01 % inhibition at the same concentration.

Discussion

For the management of diabetes mellitus, herbal preparations are being used frequently in Bangladesh as well as worldwide. Previously we have screened antidiabetic effect of another six herbal medicines on type 2 diabetic model rats. As a continuation of this process we further included another five ADHPs. The result showed that studied ADHPs are marketed in Bangladesh but significant blood glucose lowering effect in type 2 diabetic rats were found in only in ADHP-2 & ADHP-3. ADHP-1, 2 & 3 contain a number of secondary plant metabolites like flavonoid, alkaloids, tannins and ADHP-1, 3 & 4 showed significant antioxidant activity which is beneficial for type 2 diabetes management. Since dependence on herbal preparations for managing Diabetes is increasing, therefore, thorough scientific investigation of herbal medicines for both safety & efficacy is necessary.

Conflict of Interest I have no potential conflict of interest to disclose

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