Int. J. Pharm. Med. Res. 2016; 4(2):317-319 **ISSN: 2347-7008**

International Journal of Pharmaceutical and Medicinal Research

Journal homepage: **www.ijpmr.org**

Original Research Article

Anti-diabetic investigation of aqueous extract of *Pterocarpus marsupium* (Vijaysar)

***Tanuja Pathak*[1*], *Balram Prasad Sah*[2], *Dr. S.Sankar*[3], *Kumari Shipra Parmar*[4]**

[1] *Department of Pharmacology, M.B. Kedia Dental College and Teaching Hospital Birgunj, Nepal*
[1,2,3] *JSS University Mysore, Karnataka, India*
[2,] *Quset Pharmaceuticals Pvt. Ltd. Birgunj, Nepal*
[4] *Department of Biochemistry, M.B. Kedia Dental College and Teaching Hospital Birgunj, Nepal*

ARTICLE INFO:

Article history:
Received: 04 April, 2016
Received in revised form:
28 April , 2016
Accepted: 29 April , 2016
Available online: 30 April, 2016

Keywords:
Pterocarpus marsupium
Vijaysar
ACP

ABSTRACT

Powdered root of Vijaysar and its aqueous extract were screened for the anti diabetic activity in the proven diabetic rats at 200 mg and 600 mg per Kg body weights, respectively and given orally. *Pterocarpus marsupium* showed a highly significant increase in serum ALP and ACP was noticed after 7 and 14 days of diabetes induction. The 14-day PMMTE treatment of diabetic rats caused a highly significant decline in ALP and ACP levels in treated diabetic animals, Drug treatment of hyperglycemic rats produced a highly significant decrease in these serum parameters.

1. Introduction

Diabetes is a chronic disorder of carbohydrate, fat and protein metabolism characterized by increased fasting and post prandial blood sugar levels. The global prevalence of diabetes is estimated to increase, from 4% in 1995 to 5.4% by the year 2025. WHO has predicted that the major burden will occur in developing countries? Since ancient times, plants have been an exemplary source of medicine**[1]**. Ayurveda and other Indian literature mention the use of plants in treatment of various human ailments.we about 45000 plant species and among them, several thousands have been claimed to possess medicinal properties. Research conducted in last few decades on plants mentioned in ancient literature or used traditionally for diabetes has shown antidiabetic property**[2,3]**. In the last few years there has been an exponential growth in the field of herbal medicine and these drugs are gaining popularity both in developing and developed countries because of their natural origin and less side effects. The present paper reviews some of such plants and their products (active, natural principles and crude extracts) that have been mentioned/used in the Indian traditional system of medicine and have shown experimental or clinical anti-diabetic activity**[5]**. We believe that the list of medicinally important families and plants presented in this review is useful to researchers, as well as practitioners**[4]**.

2. Material and Methods

Role of phytomedicine in diabetes Phytomedicine are being looked up once again for the treatment of diabetes. Many conventional drugs have been derived from prototypic molecules in medicinal Methodology. For each experiment equal number of rats were selected & divided in three separate groups that is A, B & C. Rats of group A were treated by test drug (oral glibenclamide), rats of group B were treated by standard drug ie; Vijaysar extract alone and rats of group C were kept as control group and plain distilled water was given to them in order to compare the blood sugar level of this group with that of A & B. The test drug, standard drug and water was administered orally to rats by means of gastric tube.

2.1 Effect of Test Drug on Blood Sugar Level in normal Rats

Thirty rats of either sex, weighing 200-600 gms were selected for the experiment. They were divided into three groups – A, B & C having 10 rats in each group. Initial blood samples of every rat were collected in luoride oxalate bottle from their inner canthus of eyes through capillary tube. 5% aqueous solution of test drug was prepared and given orally through gastric tube to the rats of group 'A' in a dose of 30 mg/100 gm body weight per day for 7 days. (This optimum dose was selected after plotting dose response curve for 3 different doses.)

5% aqueous solution of water soluble solid extract of Vijaysar was prepared and given orally to the rats of group 'B' in a similar dose of 30 mg/100 gm body weight per day for 7 days. Rats of group 'C' were kept as control group and distilled water 1 ml / 100 gm body weight was given to them daily for seven days.

Corresponding Author: Tanuja Pathak*, Department of Pharmacology, M.B. Kedia Dental College and Teaching Hospital Birgunj, Nepal; E-mail: *pathaktanuja7@gmail.com*

During this period all animals received normal laboratory diet. Blood samples from all rats were collected on 1st, 3rd, 5th and 7th day of above drug treatment.

2.2 Effect of Test Drug on Blood Sugar Level in Alloxan induced hyperglycaemic Rats[3]

Thirty rats of either sex weighing 100-120 gms were selected for this study. They were kept fasting for 24 hrs prior to the experiment however, water was allowed during this period. Initial blood a sample of every rat was collected as mentioned earlier. Freshly prepared 5% aqueous solution of Alloxan monohydrate was injected intra-peritonially to all the rats in a dose of 150 mg/ kg body weight. At the end of six hrs 5% glucose solution was given orally to all the rats in a dose of 5 gm / kg body weight to prevent Alloxan induced phase of hypoglycaemia. Next day, at the end of 24 hrs of Alloxan administration blood samples were collected from all the rats and then rats were divided into three groups A, B & C having ten rats in each group. 5% aqueous solution of test drug was administered to the rats of group A orally in a dose of 30 mg / 100 gm body weight daily for seven days as earlier. 5% aqueous solution of water soluble solid extract of Vijaysar was prepared and given orally to the rats of group 'B' in a similar dose of 30 mg/100 gm body weight per day for 7 days.

3. Result and Discussion

Table No. 1: Effect of drugs on mean blood sugar levels (mg%) in normal rats (n=10 in each group)

Days	Group A (n)	Group B (n)	Group C (n)
Before drug treatment (1st day)	131.03	112.01	119.47
On 3rd day of drug treatment	127.87	112.98	115.29
On 5th day of drug treatment	127.46	117.93	125.08
On 7th-14th day of drug treatment	126.08	117.39	115.06

Table No. 2: Effect of drugs on mean blood sugar levels (mg%) in alloxan induced hyperglycaemic rats (n=10in each group)

Days	Group A (n)	Group B (n)	Group C (n)
Before Alloxan	105.46	107.96	105.35
24 hrs after Alloxan (1st day of drug treatment – prior to drug administration)	373.73	397.06	388.07
On 3rd day of drug treatment	350.13	383.11	414.00
On 5th day of drug treatment	276.21	324.18	420.20
On 7th-14th day of drug treatment	204.46	280.83	441.59

The below table shows the level of SGOT, SGPT, ALP and total protein. While comparing Experimental group with control group, the results showed that SGPT and ALP was increased and SGOT and total protein was decreased in experimental group.(p-0.05).

Table No. 2. Biochemical parameters[6]

Groups	SGPT(IU/L)	SGOT(IU/L)	ALP(IU/L)	Total protein(gm/dl)
I	64+_6.2	46+_4.1	169+_0.28	7.0+_0.5
II	65+_3.5	43+_5.8	170+_10.7	6.8+_0.3
III	67+_4.1	44+_4.6	162+_10.5	7.1+_0.1
p-value	<0.05	<0.05	<0.05	<0.05

In the last few years there has been an exponential growth in the field of herbal medicine and these drugs are gaining popularity both in developing and developed countries because of their natural origin and less side effects. Many traditional medicines in use are derived from medicinal plants, minerals and organic matter. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. Though there are various approaches to reduce the ill effects of diabetes and its secondary complications, herbal formulations are preferred due to lesser side effects and low cost. To date, over 400 traditional plant treatments for diabetes have been reported, although only a small number of these have received scientific and medical evaluation to assess their efficacy[7,9]. The hypoglycemic effect of some herbal extracts has been confirmed in human and animal models of type 2 diabetes[8].

4. Conclusion

In the present study, glucose level was reduced by the experimental drug in albino mice from day 3 and the chi square test is also showing the significant difference while comparing with control and alloxan induced albino mice. This shows that this combination can be used as a ant diabetic drug. And also body weight, WBC, RBC and hb level was increased in experimental group. Urea and creatinine level was decreased in experimental group at the same time total cholesterol and triglyceride level was increased while

comparing with control group. This shows that along with this drug combination some drug should be added to reduce total cholesterol and triglycerides. While comparing the biochemical parameters, SGPT and ALP was increased in experimental group but in contrast SGOT and total protein was decreased. Hence the drug Vijaysar (*Pterocarpus marsupium*) is having antidiabetic effect. The present study claims that tested drug extract of vijaysar has shown significant hypoglycemic effect in alloxan induced hyperglycaemic rats while there is neither decrease nor increase level of blood sugar level in the normal rats.

Acknowledgement

I am deeply obliged to INDOISRAEL HERBITECH FARMS 461/8 Sankari Road , S.R. Palayam Tiruchencode, City Salem-Namakkal, state- Tamilnadu for providing plant material. I express my sincere gratitude to Mr. Balram Prasad Sah, for constant help during research. I sincerely thank to Dr. S. Sankar, Professor and Head, Department of Pharmaceutical Chemistry, JSS university Mysore, Karnataka, India for his valuable and moral support throughout this work. “Those who are thanked last are thanked the best” and it to my beloved parents, family members and friends for their never ending ray of affection, support, encouragement and good wishes that enable me to go through all my endeavors.

References

[1]. Yoshikawa M., Murakami T., Kadoya M., Matsuda H., Muraoka O., Yamahara J., Murakami N,. Sugar beet. Hypoglycemic oleanolic acid oligoglycosides, beta vulgarosides I, II, III and IV, from the root of *Beta vulgaris* L. Chemical and Pharmaceutical Bulletin 1996;44:1212-1217.

[2]. Pari L., Amarnath Satheesh M., Antidiabetic activity of *Boerhavia diffusa* L. effect on hepatic key enzymes in experimental diabetes, Journal of Ethnopharmacol. 2004;91:109–113.

[3]. Saleem R., Ahmad M., Hussain S.A., Qazi A.M., Ahmad S.I., Qazi H.M., Ali M., Faizi S., Akhtar S.,Hussain S.N. Hypotensive, hypoglycemic and toxicological studies on the flavonol C-glycoside shamimin from *Bombax ceiba*. Planta Medica.1999;5:331–334.

[4]. Pari L., Amarnath Satheesh M., Antidiabetic effect of *Boerhavia diffusa*: effect on serum and tissue lipids in experimental diabetes, Journal of Medicinal Food 2004;7:472–476.

[5]. Satheesh MA., Pari L., Antioxidant effect of *Boerhavia diffusa* L. in tissues of alloxan induced diabetic rats, Indian Journal of Experimental Biology 2004;42:989–992.

[6]. Somani R., Kasture S., Singhai AK., Antidiabetic potential of *Butea monosperma* in rats, Fitoterapia 2006;77:86–90.

[7]. Devasagayam T.P.A., Kamat J.P., Mohan H., Kesavan PC., Caffeine as an antioxidant: inhibition of lipid peroxidation induced by reactive oxygen species in rat liver microsomes, Biochimica et Biophysica Acta 1996; 1282:63–70.

[8]. Bhattacharya A., Chatterjee A., Ghosal S., Bhattacharya SK., Antioxidant activity of active tannoid principles of *Emblica officinalis* (amla)**,** Indian Journal of Experimental Biology 1999;37:676–680.

[9]. Chakrabarti S., Biswas T.K., Seal T., Rokeya B., Ali L., Azad Khan A.K., Nahar N., Mosihuzzaman M., Mukherjee B., Hypoglycemic activity of *Caesalpinia bonducella* F. in chronic type 2 diabetic model in Long-Evans rats and evaluation of insulin secretagogue property of its fractions on isolated islets, Journal of Ethnopharmacology 2005;97:117–122.

Conflict of interest: None Declared