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EVALUATION OF THE CLINICAL EFFICACY OF *HEEN BOWITIYA* LEAVES [*OSBECKIA OCTANDRA*] POWDER IN THE MANAGEMENT OF DIABETES MELLITUS

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ABSTRACT

Diabetes mellitus is a chronic metabolic disorder with multi factorial etiologies. If it is not treated effectively and in time Diabetes mellitus produces several complications. *Heen bowitiya* [*Osbeckia octandra*] is one of the widely used endemic plants in Sri Lanka. *Heen bowitiya* is well known as liver tonic drug and mostly plant leaves are used. Although it is recommended for Diabetes mellitus, its hypoglycemic effect is not scientifically proved. So, this research was done in search of hypoglycemic effect of *Heen bowitiya* leaves powder in the management of diabetes mellitus. 30 patients were selected from the OPD of *Gampaha Wikramarachchi* Ayurveda hospital in irrespective of their sex, religion, occupation and habitat and they were treated with *Heen bowitiya* leaves powder twice a day prepared by dipping 2 spoonsful of powder in 30 ml of warm water for 15 minutes for up to one-month period. Patients were investigated with fasting blood sugar level before and after treatment. Liver function test was done before and after treatment to check any adverse effect of drug. Data was analyzed by one sample paired T test. Analyzed data revealed that p value of fasting serum blood glucose level is 0.01. It is below the significant level of 0.05. Hence it proves *Heen bowitiya* leaves powder has the hypoglycemic effect. Liver function of all the patients were analyzed before and after the treatment. After the treatment all the calculations were below the normal range.

KEYWORDS: Diabetes mellitus, *Heen bowitiya* [*Osbeckia octandra*], Hypoglycemic effect.

INTRODUCTION

Diabetes mellitus has become a major health issue worldwide with huge number of morbidity and mortality rate. It is calculated that 69% adult population of developing countries and 20% of developed countries are more prone to the disease. (Kharjul, 2016) Diabetes mellitus is an endocrine disease characterized by hyperglycemia due to impairment of insulin secretion, insulin action or both. Polyuria, polydipsia, weight loss and fatigue are some of the common symptoms of Diabetes mellitus. (Diabetes, 2013; Kharjul, 2016) It has become the epidemic of centaury due to the improper management at early stage. Uncontrolled Diabetes mellitus may lead to several complications involving eyes, nerve, kidney and blood vessels. This affects the patients quality of life and put immense pressure on cost of health care service. (Kharroubi, 2015) Insulin and other oral hypoglycemic drugs have failed to give proper cure for Diabetes mellitus. This has been led to in search of medicinal plants which are having hypoglycemic effect. Medicinal plants have been used to manage Diabetes mellitus in indigenous medicine of many cultures throughout the world. (Chikezie, 2015) Last few years requirement for herbal medicine has been developed. WHO reports due to the less cost, efficacy, potency and less side effects, 70% percentage of the world population use herbal drugs for medication. (Bases, Azetidinone and Derivatives, 2015)

Heen bowitiya (*Osbeckia octandra*) is one of the endemic plant which used in the management of Diabetes mellitus in Sri Lankan indigenous medicine and it is cultivated as an ornamental herb as it bears beautiful violet color flowers. (Meneripitiya and Jayatilleke, 2014) *Heen bowitiya* [*Osbeckia octandra*] is well known as liver tonic drug and mostly plant leaves are used. Although it is recommended for Diabetes mellitus, its hypoglycemic effect is not scientifically proved. (Medicinal plants, 2003) Most of the people in rural areas in Sri Lanka add *Heen bowitiya* leaves fresh salad to their meal to control blood sugar level. *Kolakenda* made up of *Heen bowitiya* has been recommended for the patients who are suffering from diabetes and hepatitis in Sri Lankan Indigenous medicine. (Jayaweera, 1982) Only few researches are taken place about *Heen bowitiya* plant. So it is the demand of time to investigate the hypoglycemic effect of *Heen bowitiya* plant.

Figure 01: Leaves of *Heen bowitiya.*

Figure 02: Flower of *Heen bowitiya.*

MATERIALS AND METHODS

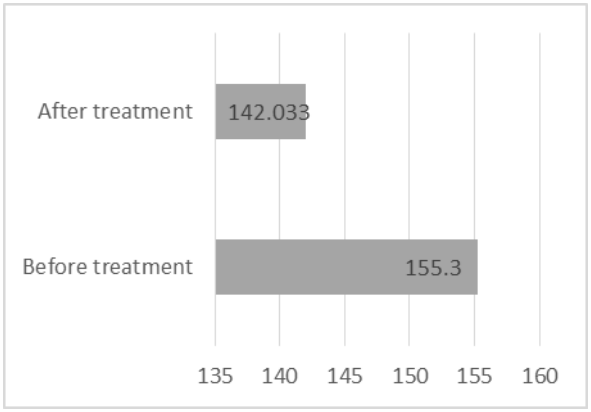
Total 30 Patients were selected from the outdoor patient department of *Gampaha Wikramarachchi* Ayurveda hospital, *Yakkala* in irrespective of their sex, religion, occupation and habitat. The patients who are having Fasting Blood Sugar level between 115-200 mg/dl and age between 30-65 were selected for the study. Patients were treated with powder twice a day prepared by dipping 2 spoonsful of *Heen bowitiya* leaves powder in 30 ml of warm water for 15 minutes, for up to one-month period. The improvement of the patients was assessed on the basis of the fasting blood sugar level of each patient before and after treatment. Detailed advices were given to the patients about the foods and regimens he/she should or should not follow. Follow up study continued up to one month after completion of the treatment. Liver function test was done to estimate any other advance effect of the drug. Data was statically analyzed by one sample paired T-test and graphs were plotted accordingly. If the T value is below 0.05 considered as significant.

RESULTS

Table 01 shows the mean values of fasting blood sugar level before and after the treatment. Graph was plotted according to the mean values. It is found that mean value of fasting blood sugar level is reduced after treating the patients with *Heen bowitiya* leaves powder. P value was 0.010.

Table 01: Values of paired T test for fasting blood sugar level.

	No	Mean	St. Dev	SE Mean
After	30	142.033	24.462	4.466
Before	30	155.300	20.115	3.673
Difference	30	-13.2667	29.414	5.370

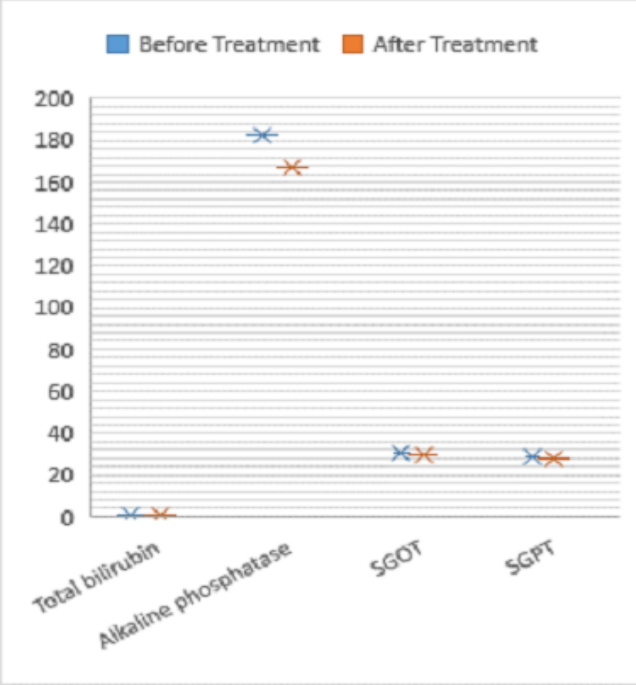


Graph 01: Mean values of fasting blood sugar level before and after the treatment.

Liver function test was done to assess any advance effect of *Heen bowitiya* leaves powder. Accordingly, total bilirubin count, Alkaline phosphatase level, SGOT and SGPT level were done before and after the treatment. Table 02 shows the mean values of checked parameters and the graph 02 plotted accordingly. All the values were in normal range and it indicates that consuming *Heen bowitiya* leaves powder do not cause any bad impact for health.

Table 02: Mean values of parameters of liver function test.

Parameter	No. of patient	Before treatment	After treatment
Total bilirubin	30	0.56	0.55
Alkaline phosphatase	30	182.7	180.2
SGPT level	30	28.9	30
SGOT level	30	30.5	28.5



Graph 02: Mean values of liver function test.

DISCUSSION

Present study showed the similar result with the other researches have done to evaluate the efficacy of different ethnobotanical plants on diabetes and related disorder to maintain the blood glucose level. Analyzed data revealed that p value of fasting serum blood glucose level is 0.01. It is below the significant level of 0.05. So it proves *Heen bowitiya* leaves powder has the hypoglycemic effect.

Extracts of *Osbeckia octandra*, can be used for pharmaceutical as well as for nutraceutical purpose as it is having high antioxidant capacities and high phenolic contents. (Perera, Ekanayake and Ranaweera, 2015; Samaradivakara *et al.*, 2016) Any advance effects of *Heen bowitiya* was not recorded. It may be due to *Osbeckia octandra* leaves extracts possess anti hepatotoxic qualities. (Thabrew, Joice and Rajatissa, 1987; Thabrew and Jayatilaka, 1999). In addition, apart from the leaves, chyme of *Osbeckia octandra* can be used as an antidiabetic food. (Ediriweera and Ratnasooriya, 2009).

Previous investigations revealed aqueous extracts of *A. heterophyllus*, *O. octandra* and *B. vulgaris* possess significant hypoglycemic activity. Among them *O. octandra* showed maximum hypo- glycemic activity at +3 hr, with *A. heterophyllus* maximum activity was not exhibited even at + 5 hr. Further it is showed that in the case of *O. octandra* the maximum hypoglycemic response and the time of its occurrence are comparable with that of

tolbutamide while *A. heterophyllus* and *B. vulgaris* appear to be more significant than tolbutamide. (Fernando, Thabrew and Karunanayake, 1990).

CONCLUSION

This study shows leaves of *Osbeckia octandra* is useful for Diabetic patients for lowering the blood glucose level. This study and following up should be carried out for longer period to investigate significant reduction on blood glucose with diabetes mellitus patients.

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