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RESEARCH ARTICLE

Effects of Aqueous Extract of Moringa Oleifera Linn on Alloxan Induced Hyperglycemia

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ABSTRACT

The study determines the effect of aqueous extract of M. oleifera seeds with respect to its route of administration. The rats were divided into 4 groups. Group I-Rats received only rat chow and water. Group II- Rats received alloxan and were treated with 500mg/kg body weight after 2hours. Group III- Rats receiving alloxan after 2 hours were treated with aqueous extract of M. oleifera (500mg/kg body weight) intraperitonially. Group IV- Rats receiving alloxan after 24 hours began receiving aqueous extract of M. oleifera seeds (500mg/kg body weight) intraperitonially for 1 week. The result of the study showed a significant decrease in the blood glucose level after 12 hours and also after 7 days of both orally and intraperitonially with M. oleifera seed extract. This proves that M. oleifera seed extract have a hypoglycemic effect on both the mild and severe alloxan induced hyperglycemic rats.

KEYWORDS

Hyperglycemia, Diabetes, Moringa oleifera

INTRODUCTION

M. oleifera is a small and deciduous tree. It is commonly known as Drumstick, (Horse) raddish tree, West Indian Ben.[1] There are various medicinal values of M. oleifera leaves like it relieves swelling, headaches, heals skin diseases, increase milk production (quality and quantity) in lacting women etc. Moringa flowers are used as a good tonic, expel worms, enlarged spleen etc.[2,3]. Every human being needs adequate nourishment for a sustainable life. Body requires adequate diet for developing and leading a healthy life[4,6]. M. oleifera is a nutritionally rich plant containing combination of nutrients, amino acids, antiaging, anti-oxidants, anti-inflammatory properties etc. It also nourishes the bodies immune system[5,6]. It promotes healthy circulation. It also supports normal blood glucose which prevents from hyperglycemia.

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So, M. oleifera have anti-hyperglycemic (anti-diabetic) activities which was confirmed by using extracts as well as leaf powders in animal studies[7,18].

MATERIAL AND METHODS

Collection and Extraction

The seeds of M. oleifera (30g) were collected from Bhopal Agro Sales, Hamidia Road, Bhopal and authenticated by CSIR-Niscare, (New Delhi) India. The seeds were dried in shades, milled and grounded into coarse powder using a laboratory Mortar. The powder soaked for 30 min in 200 ml of distilled water and filtered with a sieve. The supernatant decanted by centrifuging and then stored at temperature 50^0 C.

Animals

Healthy randomly albino wistar rats having weight between 250- 400g were obtained. Approximately 1 month before treatment all

animals were examined healthy. The animals were kept in laboratory conditions 12 hour in light and 12 hours in dark. They were fed with rat chow and water.

Experimentation

Group I: Control rats fed with rat chow and water.

Group II: Hyperglycemic rats that received only alloxan without treatment

Group III (mild hyperglycemic rats): Rats receiving alloxan after 2 hours were treated with aqueous extract of M. oleifera (500mg/kg body weight) intraperitonially.

Group IV (severe hyperglycemic rats): Rats receiving alloxan after 24 hours began receiving aqueous extract of M. oleifera seeds (500mg/kg body weight) intraperitonially for 1 week

Blood Glucose Level

Blood glucose levels were measured by glucose strip method. The tip of the tail were snipped with scissors and squeezed for a drop of blood. After insertion of the strip in machine the drop of blood was placed on the strip. The instrument measured and displayed the blood glucose level in 10 sec[8,9]. Observation of blood glucose after intraperitonial administration recorded for a week. Bioequivalence studies are for determination of the therapeutic equivalence[10].

Statistical Analysis

The data were expressed as mean ± S.E.M. Data were analysed using Student t-test and ANOVA was used for more than n two groups. Data were considered significant when $p < 0.05$.

RESULTS

Table 1: The fasting blood glucose levels of the rats after 12 hours of treatment with M. oleifera seed extract were measured in percentage and compared with the untreated group for mild hyperglycemia.

Drugs	Mild Hyperglycemia	Change in Blood Glucose Level (%)
Alloxan	198.5	-
Alloxan + M. oleifera (IP)	122.6	38.8%

Table 2: After treating with M. oleifera seed extract the percentage change in the fasting blood glucose levels of the rats were compared with the untreated group for severe hyperglycemia

Drugs	Mild Hyperglycemia	Change in Blood Glucose Level (%)
Alloxan	597	-
Alloxan + M. oleifera(IP)	64.4	92.2%

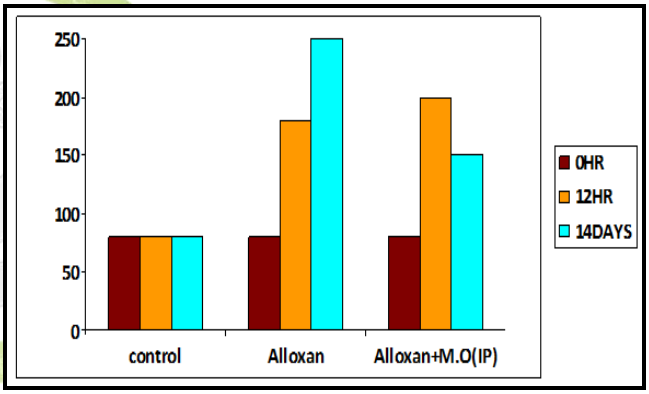

Figure 1: Effect of M. oleifera seed extract on blood glucose level of Alloxan induced mild hyperglycemia

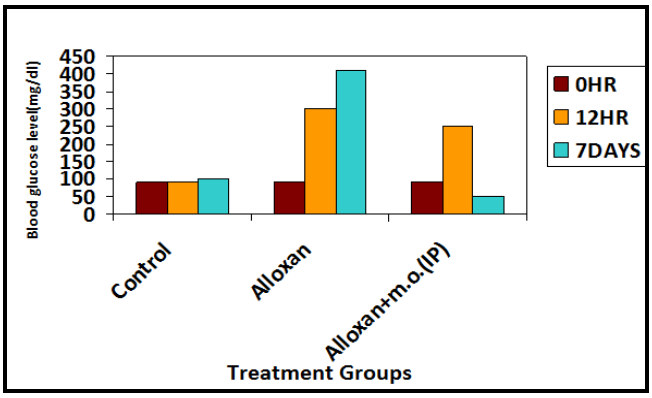

Figure 2: Effect of M. oleifera seed extract on blood glucose level of Alloxan induced severe hyperglycemia

DISCUSSION

Today billions of people on the planet are suffering from hyperglycemia. The extract of M. oleifera seeds demonstrated antihyperglycemic effect by causing a significant decrease in blood glucose level[11]. Hyperglycemia is a metabolic syndrome associated with Diabetes Mellitus. It is a common diagnostic index of Diabetes Mellitus[12].

Table 1 showed that mildly hyperglycemic rats have only a little elevation in the fasting blood glucose rats. When Alloxan was injected into an experimental rats then multiphasic blood glucose response was noted and it lasts for 20 min.[13] Then second phase appeared in which blood glucose concentration rises after 1hour administration of Alloxan this hyperglycemic phase lasts for 3-4 hours and in Table 2 Morina oleifera seed extract significantly decreases the blood glucose level of the alloxan induced severly hyperglycemic rats that demonstrated antihyperglycemic effect. In the mild hyperglycemic group, the decrease in fasting blood glucose level was noted to be 38.8% when the extract was given intraperitonially. Also in severely hyperglycemic rats it was noted that 92.2% decreases in fasting blood glucose level when the extract was administered intraperitonially. In Figure 1 and 2 the reduction in blood glucose levels is (P<0.04>) in the treated animals when M. oleifera seed extract of the same dose of 500 mg/kg body weight was administerd[14].

The seed extract of M. oleifera was able to reduce hyperglycemia induced by Alloxan due to the presence several phytochemical constituents like amino acids, saponins, vitamins and minerals, iron, phosphorus, folic acid, riboflavin, ascorbic acid etc.[15] The flowers and roots of Moringa oleifera contains antibiotic and fungicidal effects. The pods considered essential amino acids. M. oleifera also contains turpenoids, flavonoids, turpentine etc[15,16]. Flavonoids are polyphenolic compounds categorized by flavones, isoflavones, flavones, isoflavones catechism, flavonol, flavanones etc. Flavonoids posse's useful properties like anti-inflammatory, anti-microbial activity, oestrogenic activity, anti-allergic activity, anti-oxidant, vascular activity[17].

M. oleifera also contains several vitamins and minerals which are very useful for humanity. It is readily found in all over the world. The leaves of M. oleifera are used as traditional medicine for common ailments[7,18].

CONCLUSION

The study of M. oleifera shown various properties which prove that it are beneficial for human beings. The extract of M. oleifera showed a hypoglycemic effect on both the mild and severe alloxan induced hyperglycemic rats. This indicates that it may be used for the treatment of hyperglycemia.

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