

## Effect of Diabecon a Multiherbal Formulation On Serum Glucose Level In Alloxan Induced Diabetic Rats

Dr. Nitin Kapure<sup>1</sup>, Dr. Kiran Vakade<sup>2</sup>, Dr. B.B. Nayak<sup>3</sup>

<sup>1</sup>Medical Adviser, Alkem Pharmaceuticals, Pune,  
<sup>2</sup>Associate Professor, <sup>3</sup>(Retd.)Professor & Head,  
Department of Pharmacology, DVVPFs Medical  
College & Hospital, Ahmednagar-414111

Corresponding Author : Dr. Kiran Vakade

E-mail : dr.kiran84@gmail.com

Address : Department of Pharmacology, DVVPFs  
Medical College & Hospital, Ahmednagar-  
414111

### Abstract :

**Background:** Diabetes mellitus is a group of metabolic disorders characterised by hyperglycemia resulting from defects in insulin secretion, action and both. Though different types of oral hypoglycemic agents are available along with insulin for the treatment of Diabetes Mellitus, there is growing interest in herbal remedies, due to side effects associated with these therapeutic agents. Because of their perceived effectiveness, minimal side effects in clinical experience and relatively low costs, herbal drugs are prescribed widely. Diabecon (commercial name of a polyherbal drug) is a mixture of various extracts derived from Indian indigenous herbs commonly used against diabetes. The objective of our study is to study the effects of diabecon a multiherbal preparation on serum glucose level in alloxan induced diabetic rats. **Methodology:** Alloxan induced diabetic rats of either sex were divided into two groups (Group A and Group B), each group consisting of six animals. Group A was control group and Group B was test group. Group A animals were treated with distilled water while group B animals were treated with Diabecon (1 mg/kg/day, single daily dose) for 28 days. Blood samples were collected after 1, 3 and 6 hr after last dose of the test drug on 28th day and serum glucose level was estimated in control and diabecon treated group. Paired and Unpaired t test were used for the analysis of the result. **Result:** In diabetic rats, diabecon produced significant hypoglycemic effect after 28days treatment. **Conclusion:** In our study we found that Diabecon has significant serum glucose lowering effect in alloxan induced diabetic rats.

**Key words:** Diabetes, Diabecon, Serum glucose level, Alloxan

### Introduction:

Diabetes mellitus is a group of metabolic disorders characterised by hyperglycemia resulting from defects in insulin secretion, action and both.<sup>(1)</sup> Once considered as single disease entity, Diabetes Mellitus is now seen as heterogeneous group of diseases characterised by a state of chronic hyperglycemia resulting from a diversity of etiologies, like environmental and genetic factors acting jointly. The chronic hyperglycemia of diabetes is associated with long term damage, dysfunction and failure of various organs, especially eyes, kidneys, nerves, heart and blood vessels and intercurrent infections.<sup>(2)</sup> Though different types of oral hypoglycemic agents are available along with insulin for the treatment of Diabetes Mellitus, there is growing interest in herbal remedies, due to side effects associated with these therapeutic agents. Because of their perceived effectiveness, minimal side effects in clinical experience and relatively low costs, herbal drugs are prescribed widely even when their biologically active compounds are unknown.<sup>(3)</sup>

Many plant species viz; Acacia Arabica, Areca catechu, Coccinia indica, Hibiscus rosasinesis, Vinca rosea etc. have been used in traditional system of medicine like Ayurveda, Siddha and Unani etc. for antidiabetic formulations.<sup>(4)</sup> Following the WHO's recommendation for research on the beneficial uses of medicinal plants in the treatment of diabetes mellitus, investigations on hypoglycemic agents derived from medicinal plants have gained momentum.<sup>(5,6)</sup> Diabecon (commercial name of a polyherbal drug) is a mixture of various extracts derived from Indian indigenous herbs commonly used against diabetes.<sup>(7)</sup> Diabecon has been found to reduce blood glucose level in many experimental trials.<sup>(8)</sup>

### Methodology:

**Aim:** To study the effects of diabecon a multiherbal preparation on serum glucose level in alloxan induced diabetic rats.

It was an animal experimental study. The study was conducted in the department pharmacology of medical college located in Western Maharashtra. The study was conducted only after the permission of Institutional Animal Ethics Committee.

**Experimental animals:** Albino Wistar rats of either sex (150-250 grams) were used for the study. All animals were acclimatized for seven days under standard husbandry conditions i.e. room temperature of 25±10C, relative humidity 45-55% and a 12:12 light/dark cycle.

The animals had free access to standard rat pellet (Pranav Agro Industries Ltd, Sangali, Maharashtra, India), with water supplied ad libitum under strict hygienic conditions. Animals were habituated to laboratory conditions for 48 hours prior to experimental protocol to minimize if any of nonspecific stress.

#### Drugs/Chemicals used in the study:

1. Diabecon (The Himalaya drug company, Bangaluru, Karnataka, India)
2. Alloxan (SD fine-chem Ltd., Mumbai, India)
3. Glucose estimation kit (Supplied by Span diagnostic Ltd, Surat)

#### Equipment used:

1. Feeding tubes: the custom made rat oral feeding tube was used for oral administration of diabecon.
2. Tuberculin syringe: Used for injecting Alloxan into peritoneal cavity.
3. Capillary tubes: Microhaematocrit capillary tubes used for collection of blood samples by retro-orbital plexus puncture technique to investigate hematological parameters.

**Induction of diabetes:** Alloxan monohydrate was used to induce diabetes mellitus. After an overnight fasting, the rats were injected freshly prepared 2% solution of alloxan monohydrate in 0.9% sodium chloride solution. The dose injected was 150 mg/kg body weight.<sup>(9)</sup> Rats which developed stable hypoglycemia with fasting blood sugar more than 200 mg/dl after 72 hrs were selected for the study.

**Plan of study:** Alloxan induced diabetic rats of either sex were divided into two groups (Group A and Group B), each group consisting of six animals.

Group A was control group and Group B was test group. Group A animals were treated with distilled water while group B animals were treated with Diabecon (1 mg/kg/day, single daily dose) for 28 days. Blood samples were collected after 1, 3 and 6 hr after last dose of the test drug on 28th day and serum glucose level was estimated in control and diabecon treated group. Paired and Unpaired t test were used for the analysis of the result.

#### Results:

Effects of diabecon on serum glucose level (mg% as Mean  $\pm$  SEM) in diabetic albino rats:

Groups	Before starting treatment	After last dose of 28 days treatment		
		After 1hr	After 3hr	After 6hr
Group A (Control group)	307.8 $\pm$ 8.1	305.6 $\pm$ 12.5	309 $\pm$ 6.6	312.3 $\pm$ 8.1
Group B (Diabecon treated group)	319.3 $\pm$ 10.2	169.2 $\pm$ 7***###	182.8 $\pm$ 6.5***###	185 $\pm$ 5.3***###

**Note:** All the values are expressed as Mean  $\pm$  SEM, P- values of paired t test is expressed as \*(<0.05), \*\*(<0.01), \*\*\*(<0.001),

P – values of unpaired t test is expressed as # (<0.05), ##(<0.01), ### (<0.001)

Alloxan given 150 mg/kg IP produced stable hypoglycemia at >300 mg% after 72 hrs. These rats were further used to see the effect of diabecon on serum glucose level. In diabetic rats diabecon produced significant hypoglycemic effect after 28 days treatment.

#### Discussion:

Diabecon is a polyherbal formulation marketed by "The Himalaya Drug Company, Bangalore, Karnataka" for the treatment of diabetes mellitus. The formulation contains extract from 14 different mechanical plants which are used as antidiabetic agents.<sup>(10)</sup>

The pharmacological effect of Diabecon has been studied by some workers. They have reported that Diabecon elicit hypoglycemic action in lab animals as well as in diabetic patients, probably by release of insulin from pancreatic  $\beta$  islet cells and also accelerating glucose uptake in peripheral tissues.<sup>(10-12)</sup> The present study also confirms serum glucose lowering effect of Diabecon in alloxan induced diabetic rats following a 4 weeks of treatment.<sup>(10-12)</sup>

Limitations of the study: We haven't study the combined effect of diabecon and other hypoglycemic drugs on diabetic rats. Such type of studies will be more helpful in the management of diabetes.

#### Conclusion:

In our study we found that Diabecon has significant serum glucose lowering effect in alloxan induced diabetic rats.

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