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Original Research Paper

Ayurveda

ASSESSMENT OF HYPOGLYCEMIC ACTIVITY RASAKA SATTVA BHASMA IN ALBINO RATS.

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ABSTRACT Rasaka is very important element of Maharasa varga. It is considered to be excellent medicine in Prameha. Hence current study is aimed at assessment of hypoglycemic activity Rasaka sattva bhasma in albino rats.

KEYWORDS : Rasaka sattva bhasma, Hypoglycemia.

INTRODUCTION:

Rasaka is an ore of Zinc, which was used to extract 'Yashada' (Zinc) in ancient times. Sattvapatana is an important process described by ancient Rasacharyas to extract purest form of various rasadravyas which were used for dehasidhhi and lohasidhhi. This process of extraction was not known to the Europeans until 1721 A.D.; but it was known to Indians from 9th century or even before that. Sadly very little progress or research has been done in this field. Sattva bears more potency than bhasma, even though, the actual usage of sattva in clinical practice is not seen. This arouses a dire need to study the preparatory methods of sattva and its merits and demerits.

AIM:

To assess hypoglycemic activity Rasaka sattva bhasma in albino rats.

METHODOLOGY:

Hypoglycemic Study (On Alloxan Induced Hyperglycemia In Albino Rats)

Study Group:

Test Group - 40 mg *Rasaka sattva bhasma*.
Control Group - 1 ml Carboxy methyl cellulose.

METHOD:

1. The animals were starved for 24 hrs and water ad libitum.
2. Preparation of Alloxan was done in 0.9% cold saline.
3. The dose of Alloxan was 150mg/kg body wt.
4. After preparation of Alloxan solution it was kept in defreezer for 5 minutes
5. Hyperglycemia was induced by the single intraperitoneal injection in 150mg/kg dose of Alloxan.
6. The fasting glucose level checked after 72 hours after induction and rats with blood glucose level above 220mg/dl were selected for experiment.
7. Blood was withdrawn from tail vein by puncturing with hypodermic needle.
8. Drugs specific to groups were administered 1 hour after confirmation of hyperglycemia.
9. 1 hour after confirmation blood was withdrawn from tail vein.
10. Blood was withdrawn on 1st,4thand 7th day to estimate blood glucose level.

Table Showing The Drug Schedule:

Hypoglycemic activity study:

Sr. No	Group	No. of Rats	Drug	Dose
1	Test drug	6	*Rasaka sattva bhasma*	40mg/200gms of rat
2	Control drug	6	Carboxy methyl cellulose	1 ml

EVALUATION OF HYPOGLYCEMIC ACTIVITY:

The animals were rendered diabetic by injecting alloxan through tail vein dialated by applying hot water swab, at a dose of 150 mg/kg body weight. Alloxan was weighed according to the body weight of animals separately before starting the experiment and the alloxan in phosphate buffer solution (pH 6.4) was prepared freshly prior to the injection.

After 3 hours of Alloxan injection, all the animals were injected 1 ml of (100mg/ml) glucose I.P. because of the severe hypoglycaemia due to β-cell degranulation and necrosis resulting into increased insulin release.

After 3 days glucose was measured in blood samples collected from tail vein. Rats with blood glucose level above 220mg/dl were included in the experiment. The blood samples were obtained through the tail vein puncturing with hypodermic needle and blood glucose level was measured by using glucometer.

Estimation Of Glucose:

The blood samples were obtained through tail vein by puncturing with hypodermic needle. A drop of blood so obtained was placed on the enzyme treated surface of the haemoglucostrip, which was kept in the glucometer. The glucometer was kept on, then after 2 minutes glucomonitor reading was recorded.

Blood was withdrawn on 1st,4thand 7th day to estimate blood glucose level.

DISCUSSION:

Experimental Study:

Experimental Model For Induction Of Diabetes Mellitus

1. In the current study, chemical induction of diabetes by Alloxan monohydrate was selected because it is reliable, economical, and easily reproducible and has a choice of different routes of administration.
2. Route of administration was intraperitoneal as it provides larger area for better absorption.
3. Dose of Alloxan monohydrate was kept at 150mg/kg body weight.
4. Diabetes was induced by a single IP dose.
5. Alloxan causes degranulation and destruction of beta cells in pancreas resulting in increased BSL levels.
6. Special precautions were taken as Alloxan is highly toxic.

Toxicity Study

1. Limit test was performed at 2000mg/kg dose of Rasaka sattva bhasma and no toxic signs were observed which confirms non toxicity of the drug.

LD50 (Limit Test):

• The limit test is primarily used in situations where the experimenter has information indicating that the test material is likely to be non-toxic, so limit test is carried out.

• Rasaka sattva bhasma treatment in the dose 2000 mg/kg in female wistar rats did not showed any toxic symptoms or mortality, hence the LD_{50} was considered to be more than 2000mg/kg.

• In the present study $1/10^{th}$ of LD_{50} that is 200mg/kg dose was selected to carry out hypoglycemic study.

Experimental Study Proper

The animals were rendered diabetic by injecting Alloxan intra peritonially, at a dose of 150 mg/kg body weight. Alloxan was weighed according to the body weight of animals separately before starting the experiment and the Alloxan solution was prepared in 0.9% cold saline (i.e. 900mg of NaCl dissolved in 100 ml water).

After 3 hours of Alloxan injection, all the animals were given glucose solution orally because of the severe hypoglycemia due to -cell degranulation and necrosis resulting into decreased insulin release. After 3 days glucose was measured in blood samples collected from tail vein. Rats with blood glucose level above 220mg/dl were included in the experiment. The blood samples were obtained through the tail vein puncturing with hypodermic needle and blood glucose level was measured by using glucometer.

Analysis Of Results

1. There was no difference in the means of test and control groups on first day.

2. On 4^{th} and 7^{th} day significant difference in the means was observed which indicates that Rasaka sattva bhasma has anti hyperglycemic in Alloxan induced hyperglycemia in albino rats.

3. This result supports the Mehaghna property of rasaka sattva bhasma mentioned in various texts.

Probable Mode Of Action Of Rasaka Sattva Bhasma

1. Kleda in the body, abaddha Dhatu and Bahudrava Shleshma are the prominent factors in Samprapti of Prameha.
2. Rasaka is Katu, Kashay in Rasa, these are responsible for clearing of abddha Meda Dhatu and shoshan of excess Kleda created in the body.
3. Laghu, Ruksha guna helps in shoshana and Lekhana of bahudrava Shleshma, abaddha Meda, Mamsa, Vasa, Majja and Lasika.
4. It is mentioned as kapha pittaghna in texts which means it is able to reduce excess Drava guna in these Doshas by above guna.
5. Due to Lekhana property it can clear the avarodha in Medovaha strotas and help in Samprapti vighatana.
6. Rasaka also has Rasayana property hence it can recover Dhatukshaya in Prameha.
7. It is proven that Rasaka sattva bhasma contains highest quantity of Zinc.
8. Zinc is required for the preparation of insulin and increases the duration of insulin action when given by injection. Zinc is used in the Beta-cells of the pancreas to store and release insulin as required.
9. Hence it can be said that Rasaka sattva bhasma shows anti hyperglycemic activity by clearing the excess Kleda present in Doshas, Dooshyas and Strotasas, biochemically it can help beta cells of pancreas to store maximum amount of insulin and to release it when required.

CONCLUSION:

From the study it can be concluded that Rasaka sattva bhasma has hypoglycemic activity in albino rats.

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