AIM: Insulin hypoglycemic effect in rabbit

REFERENCE:

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INTRODUCTION:

Insulin is a peptide hormone secreted by the β-cells of the pancreas that plays a crucial role in regulating blood glucose levels. It promotes the uptake of glucose by tissues such as muscle and adipose tissue and enhances glycogenesis in the liver.

In experimental pharmacology, rabbits are commonly used to study the hypoglycemic effect of insulin because their glucose metabolism is sensitive and measurable. Administration of insulin leads to a significant reduction in blood glucose levels, which can be quantitatively estimated over time.

PRINCIPLE:

The experiment is based on the ability of insulin to lower blood glucose levels (hypoglycemic effect).

After administering insulin to a fasting rabbit:

- Insulin increases glucose uptake by peripheral tissues
- Enhances conversion of glucose into glycogen (glycogenesis)
- Inhibits gluconeogenesis and glycogenolysis

This results in a progressive fall in blood glucose levels, which can be measured at different time intervals using biochemical methods (e.g., glucometer or glucose oxidase method).

The degree of hypoglycemia is directly proportional to the dose of insulin administered.

REQUIREMENTS:

Animal: Rabbit (1.8 – 3kg)

Drugs: 20 unit of insulin (004082 mg of insulin/ unit)

Instrument: Glucometer, Syringe

PROCEDURE:

1) Select healthy rabbits weighing 1.3 to 3 kg
2) Fasten the rabbit for overnight and withdraw blood from marginal ear vein and measure blood glucose level (Initial blood glucose level)
3) Inject insulin (0.15 unit/kg) to the animals and check the blood glucose level after the interval of 1 hour (final blood glucose level)
4) Compare both initial and final blood glucose levels.

OBSERVATION TABLE:

Sr. No.	Initial blood glucose level (mg/ml)	Final glucose level at the intervals of 1 hour
1		
2		
3		
Mean		

INFERENCE:

Sr. No.	Initial blood glucose level (mg/ml)	Final glucose level at the intervals of 1 hour
1	100	82
2	103	80
3	104	85
Mean	**102.33**	**82.33**

CONCLUSION:

Insulin produces a marked hypoglycemic effect in rabbits by enhancing glucose utilization and storage while inhibiting glucose production. The experiment confirms the pharmacological action of insulin as an effective antidiabetic hormone and demonstrates its role in maintaining glucose homeostasis.

RESULT:

Mean decrease in blood glucose level after administration of insulin at various time intervals indicate its hypoglycemic effect.