

LETTER TO THE EDITOR

EFFECT OF ISONIAZID ON INSULIN INDUCED HYPOGLYCEMIA IN RABBITS

Sir,

( Received on April 20, 1989 )

Frequent coexistence of pulmonary tuberculosis and diabetes mellitus is a well known observation. Long term therapy with antitubercular and anti-diabetic drugs is quite likely to exhibit drug interactions. In the present study we have studied the effect of isoniazid on insulin induced changes in blood sugar level.

The study was carried out on healthy albino rabbits of either sex weighing 1-2 kg. Blood samples were collected from marginal vein of pinna in fluoride vials at 1, 2, 4 and 6 hr after insulin/isoniazid administration. Rabbits were divided into 3 groups of 4 rabbits each. In group I the effect of insulin (1 unit/kg, sc) on blood sugar level was studied. In group II the effect of isoniazid (5 mg/kg,

po) alone on blood sugar level was studied. In group III acute effect of isoniazid was studied on the pattern of changes in blood sugar level produced by insulin. Blood sugar estimation was done by the technique of Nelson-Somogyi modified by Somogyi. All the reagents used in the study were AR/GR quality and were prepared by glass distilled water.

Crystalline insulin exhibited a significant hypoglycemia with a peak mean percentage fall of  $60.07 \pm 2.07$  at 2 hr which gradually decreased and completely recovered at 6 hr (Table I). Isoniazid produced a biphasic response consisting of initial hypoglycemia at 1 hr followed by hyperglycemia with a peak mean rise of  $34.57 \pm 1.17\%$  at 2 hr (Table I).

TABLE I : Modification of insulin induced changes in blood sugar level by isoniazid.

S. No.	Drug treatment	n	Percent change (time interval in hours)			
			1	2	4	6
1.	Insulin (1 IU/kg, S. C.)	4	-43.50	-60.07	- 6.87	-1.45
			$\pm 1.97$	$\pm 2.07$	$\pm 2.75$	$\pm .96$
			<.001	<.001	>.05	>.05
2.	Isoniazid (5 mg/kg, P. O.)	4	-11.59	+37.57	+ 7.60	-4.60
			$\pm 1.15$	$\pm 1.17$	$\pm 1.91$	$\pm .48$
			P* <.05	<.001	>.05	>.05
3.	Insulin (1 IU/kg, S. C.)	4	-24.31	-19.6	-27.57	-2.46
			$\pm 1.36$	$\pm 2.10$	$\pm 1.26$	$\pm .72$
			P** >.05	<.001	>.05	>.05
	Isoniazid <sup>+</sup> (5 mg/kg, P. O.)					

P\* value indicate the degree of significance as compared to its own control

P\*\* value indicates the degree of significance of difference in blood sugar level as compared to insulin alone.

'n' Indicates the number of animals observed.

Insulin induced hypoglycemia in isoniazid pretreated rabbit was significantly altered as hypoglycemic effect was greatly antagonised at 1 and 2 hr as compared to insulin alone at the corresponding time (Table I).

treatment significantly antagonises the insulin induced hypoglycemia. The nature of antagonism is not clarified by the present study. A rise in blood sugar with isoniazid and slowing down of rise and fall of glucose in oral glucose tolerance test has been observed by other workers too (1, 2).

The observations reveal that isoniazid pre-

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REFERENCES

1. Segarra FR. Experiences with tolbutamide and chlorpropamide in tuberculous diabetic patients. *Ann NY Acad Sci* 1959; 74 : 656.
2. Luntz GR, Smith SG. Effect of isoniazid on carbohydrate metabolism in controls and diabetics. *Br Med J* 1953; 1 : 296.

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TABLE I  
Mean blood glucose (mg/100 ml) in blood sugar test in rabbits

Group	0 hr	1 hr	2 hr	3 hr
Control	100 ± 10	110 ± 10	120 ± 10	110 ± 10
Isoniazid (100 mg/kg)	100 ± 10	110 ± 10	120 ± 10	110 ± 10
Insulin (0.5 U/kg)	100 ± 10	80 ± 10	60 ± 10	80 ± 10
Isoniazid + Insulin	100 ± 10	90 ± 10	70 ± 10	90 ± 10