

LETTER TO THE EDITOR

RELEASE OF CATECHOLAMINES FROM THE ADRENAL MEDULLA BY HISTAMINE AND ITS PREVENTION BY *ALBEZZIA LEBBEK* IN GUINEA PIGS

Sir,

(Received on June 9, 1981)

Histamine is known to increase the release of adrenaline by direct action on adrenal medulla (2). In our clinical study plasma catecholamine level has been found to be higher in the patients of bronchial asthma. Further, positive correlation has been noticed between histamine and plasma catecholamine levels (7) when these patients were subjected to *Albezzia lebbek* (Shirisha) therapy, along with amelioration in symptoms, fall in histamine level and decrease in plasma catecholamines (5,7). In experimental study histamine-induced bronchospasm was also prevented by the administration of *Albezzia lebbek* in guinea pigs; simultaneously, a rise in plasma cortisol has been recorded (6).

In this study the effect of exogenous histamine on plasma catecholamine was assessed in guinea pigs. Another group of animals has been treated with *Albezzia lebbek* along with histamine to see any modification in the catecholamine response to histamine.

Twentyfour guinea pigs (350–400 g) were kept on routine laboratory diet and were divided into three groups each consisting of 8 animals; group 1 was kept as a control and received only distilled water (the solvent); group 2, was injected histamine acid phosphate intramuscularly at a dose of 0.02 mg/kg per day for 7 days and group 3 received *Albezzia lebbek* at a dose of 100 mg/ml per 1/g of body weight along with histamine for the same period.

The animals were sacrificed by cervical dislocation on the seventh day. The adrenal glands were dissected out free from other adhesive tissues and fixed in dichromate solution for the differentiation of noradrenaline and adrenaline granules in adrenal medulla. PAS and aniline blue stains were used (4). For the biochemical estimation heparinized blood samples were collected from the animals of each group and the plasma catecholamine level was estimated by spectrophotometric method (3).

The above mentioned dose of histamine was tolerated very well, except that the respiration was faster and the animals were dyspnoeic for 5-10 min after injection; this

was followed by gradual recovery. There was no mortality. On the other hand in the drug treated group the effect of histamine was not so pronounced and was short-lived (2 to 3 min). The drug was also tolerated very well.

In response to histamine challenge, plasma catecholamines increased in comparison to the normal (Table I). On the other hand, the group receiving *A. lebbek* along with histamine had a different biochemical pattern; plasma catecholamine was much lower and nearer to the control value (Table I).

TABLE I : Effect of histamine and *Albezzia lebbek* on plasma catecholamine level in guinea pigs.

Group	Catecholamine $\mu\text{g}/100\text{ ml}$ (Mean \pm SEM)	Statistical group	P value
1. Control	24.90 \pm 0.08	1 VS 2	P < 0.001
2. Histamine-treated*	39.50 \pm 0.39	2 VS 3	P < 0.001
3. Histamine-and drug-treated*	30.03 \pm 0.12	3 VS 1	P < .001

* See text for details of treatment.

The biochemical findings are corroborative with the histochemical picture of the adrenal medulla. In histamine-treated group, the total medullary area was increased and the size of the individual clusters and medullary cells was also increased, while in the normal groups and group receiving *Albezzia lebbek* along with histamine, medullary area was comparatively smaller as compared to histamine treatment and the size of the individual clusters was also small in these groups.

It is obvious from the observations that plasma catecholamine level was raised by the intramuscular administration of histamine due to activation of medullary cells the area of which has been found to be increased in size. It is in conformity with the previous observations (2). But with the simultaneous administration of *Albezzia lebbek* the release of catecholamine in response to histamine was reduced. This is only possible if the histamine effect is counteracted or histamine is destroyed by the drug. Normally the histamine is destroyed by histaminase. In a previous study (6) it has been found that drug has a tendency to increase the plasma histaminase level. Probably the reduction in catecholamine level in drug-treated groups may be either due to production of this enzyme or the drug may have itself antihistaminic property.

It is reported earlier that the plasma cortisol level was increased by the administration of *Albezziya lebbek* in patients of bronchial asthma (5). Probably this increase in cortisol may be helpful in the suppression of histamine reactions including the catecholamine response because it is established that the allergic effect of histamine is controlled or prevented by cortisone, though it is controversial as to how far cortisone can reduce the histamine concentration in blood (1). With the rise in plasma cortisol the untoward effects like bronchospasm, hypotension, hypothermia are counteracted; hence the necessity for the secretion of a catecholamines is likely to be reduced. Probably this is the reason why in the drug treated group the rise in plasma catecholamines was less as compared to histamine treated group.

ACKNOWLEDGEMENTS

Authors are thankful to C.S.I.R. for financial assistance.

PRATIBHA TRIPATHI, Y. B. TRIPATHI, P. K. DEY AND S. N. TRIPATHI

*Department of Kayachikitsa,
Institute of Medical Sciences,
Banaras Hindu University, Varanasi-221 005*

REFERENCES

1. Code, C.F. and R.G. Mitchell. Histamine, eosinophils and basophils in the blood. *J. Physiol.*, (Lond.) **136** : 449-468, 1957.
2. Drazen, J.F. Adrenergic influence on histamine mediated bronchoconstriction in the guinea pigs. *J. Appl. Physiol.*, **44** : 340-345, 1978.
3. Ghosh, N.C., P. Deb and S. Banerjee. Determination of serum catecholamines. *J. Biol. Chem.*, **194** : 1967.
4. Mukherjee, M. Histochemical studies of catecholamine. D.Sc. Thesis, Calcutta University.
5. Tripathi, S.N., P. Shukla, A.K. Misra and K.N. Udupa. Experimental and clinical studies on adrenal function in bronchial asthma with special reference to the treatment with *Albizzia lebbek*. *Quart. J. Surg. Sci.*, **14** : 169-176, 1978.
6. Tripathi, S.N. and P. Shukla. Effect of histamine and *Albezziya lebbek* Benth on guinea pig adrenal glands. *Ind. J. Exp. Biol.*, **17** : 915-917, 1979.
7. Tripathi, P. Effect of *Albizzia lebbek* Benth an adrenals with special reference to its role in the management of histamine mediated bronchial asthma. Ph.D. Thesis, Banaras Hindu University.