SHORT COMMUNICATION

DISTRIBUTION OF 5-HYDROXYTRYPTAMINE AND HISTAMINE IN TISSUES OF WLH CHICKEN

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Summary: 5-Hydroxytryptamine and histamine were estimated in lungs, liver, spleen and adrenals of chicken. A substantial amount of both the amines was found in all the organs. The highest level of both the amines was found in adrenals followed by spleen, lungs and liver. The level of 5-hydroxytryptamine was, however, higher than histamine in all the tissues except adrenals.

Key words: 5-hydroxytryptamine histamine chicken

INTRODUCTION

5-Hydroxytryptamine (5-HT) and histamine are widely distributed in animal tissues, work done on mammalian tissues is well documented but data available on the levels of 5-HT and histamine in tissues of poultry is scanty, the work relating mostly to heart and spleen (1, 2, 5). The present work was undertaken to study the pattern of distribution of 5-HT and histamine in a vareity of tissues of chicken, using fluorometric method of estimation.

MATERIALS AND METHODS

Lungs, liver, spleen and adrenals were quickly dissected out from decapitated WLH chicken (20-25 weeks age) of either sex, washed, wiped dry, weighed and then homogenised in 10 *ml* acid butanol. After centrifugation, aliquots of 4 *ml*, in duplicate, were subjected to analysis of 5-HT and histamine employing the fluorometric method of Sadavongvivad (4), and using internal standards and reagent blank in estimations.

RESULTS

The concentration of 5-HT and histamine in various poultry tissues are shown in Table I.

The level of both histamine and 5-HT was found to be highest in adrenal followed by spleen, lung and liver. The 5-HT/histamine ratios revealed preponderance of 5-HT over histamine in spleen, lung and liver. The amine levels were about equal in adrenal glands.

TABLE I : Levels of 5-HT and histamine in tissues of WLH chicken.

Tissues	*5-Hydroxytryptamine (µg/g of tissue)*	*Histamine (µg/g of tissue)*	*Ratio 5-HT/ histamine*
	Mean ± S.E.	*Mean ± S.E.*	
Lung	4.21 ± 0.42	3.13 ± 0.26	1.35
Liver	1.67 ± 0.21	1.04 ± 0.07	1.61
Spleen	34.21 ± 3.17	8.66 ± 0.88	3.95
Adrenal	58.04 ± 4.56	61.05 ± 5.44	0.95

Each value is the mean of 10 observations.

DISCUSSION

Sturkie and his associates (5) have suggested an association between 5-HT level and sympathetic innervation and catecholamine levels in chicken heart. The sympathetically innervated structures can take up 5-HT has also been reported (6). Uptake of serotonin in denervated heart was about one-half the 5-HT taken up by the innervated chicken heart (5). In view of this, concentration of 5-HT in various tissues may depend on the vascularity of an organ and the extent of sympathetic innervation. Our finding that highest concentration of 5-HT occurs in adrenals, followed by spleen, lung and liver supports this view.

It is pertinent here that a decreasing order of tissue catecholamine level was found (7) in chicken adrenals, spleen, lung and liver (10.301 *mg/g*, 5.855 *µg/g*, 2.021 *µg/g*, 1.113 *µg/g*, respectively). Further, as in the case of 5-HT, a parallelism between histamine, 5-HT and catecholamines has also been reported in chicken heart (1). It is, therefore, logical to assume that a possible relationship between these amines may exist in organs under report as suggested for the chicken heart (1, 5). High levels of histamine and 5-HT have also been reported in the spleen of chicken (1, 5). El-Alkad and Sturkie (1) attributed high histamine level to large concentration of blood cells in splenic tissue. In the present work, contribution of formed elements of the blood in tissue amine levels can not be excluded since both the amines are bound to thrombocyte and leucocyte (1,3,5).

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