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THE METABOLISM OF HISTAMINE IN A CASE OF COLD URTICARIA

By

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High values of blood histamine (*Henderson, Code & Roth* 1958, *Lindell, Nilsson & Rorsman* 1961, *Rose* 1941 and 1954), plasma histamine (*Henderson, Code & Roth* 1958) and urinary histamine (*Henderson, Code & Roth* 1958) have been found in cases of cold urticaria. This communication presents a case of cold urticaria where not only the urinary excretion of histamine but also that of two histamine metabolites was studied.

The patient was a 28 year old male who had suffered from cold urticaria about one year. The urine was collected in 24 hours' portions in bottles containing hydrochloric acid during seven consecutive days. On the 4th and 5th day the patient provoked attacks by taking baths. The temperature of the water was gradually diminished until the patient had a full attack with general erythema and itching over the whole exposed body surface.

The cutaneous changes faded away in about 10 minutes after the end of the exposure to cold water. On the 6th day the patient got an unintentional mild attack by taking a bicycle ride. He never suffered any feeling of malaise, heart palpitation or vertigo during the attacks.

The urinary excretion of histamine (*Wetterqvist & White* 1969), methylhistamine (*Granerus, Wetterqvist & White*

1968) and methyl imidazole acetic acids (*Granerus & Magnusson* 1965) was investigated during the seven days and the results are given in Table 1.

TABLE 1

The daily excretion of histamine, methylhistamine and the two isomers of methylimidazoleacetic acid in a case of cold urticaria.

Day	Urine volume ml/24 hrs	Symptoms	Histamine base $\mu\text{g}/24$ hrs	Methyl- histamine $\mu\text{g}/24$ hrs	1-methyl- 4-imida- zoleacetic acid mg/24 hrs	1-methyl- 5-imida- zoleacetic acid mg/24 hrs
1	1580	No	18	175	1.5	2.8
2	2265	No	14	216	1.4	2.2
3	615	No	10	105	1.7	3.3
4	1570	Urticaria	80	361	8.3	0
5	1015	Urticaria	68	227	7.8	0
6	850	Slight urticaria	48	164	5.0	0
7	1550	No	16	182	1.6	0.5

There was a striking increase in the urinary excretion of histamine and its metabolites during the days when the patient suffered from cold urticaria. The increase of urinary histamine and 1-methyl-4-imidazoleacetic acid was more pronounced than that of methylhistamine. However, 1-methyl-5-imidazoleacetic acid, which is probably not a histamine metabolite, disappeared from the urine during the same days.

The increase in the histamine excretion may well be due to release from mast cells of the skin and/or the basophilic granulocytes of the blood (*Horton, Brown & Roth* 1936). *Lindell, Nilsson & Rorsman* (1961) have shown that there is no difference between healthy individuals and people suffering from cold urticaria in the excretion of radioactive histamine and its metabolites after an intravenous injection of radioactive histamine. This indicates that the catabolism of histamine is normal in these patients, whereas our findings of increased urinary excretion of both histamine and its

metabolites provide additional evidence that there is, during attacks, an increased liberation and/or formation of histamine. Despite this over-all increase, the proportions between the substances excreted did not change much, which supports the view, that histamine catabolism was unchanged.

Dunér, Pernow & Sterky (1960) have shown that the increased blood histamine in venous blood draining one hand and forearm subjected to cold, is of the same magnitude in healthy subjects and in patients with cold urticaria. *Schayer* (1960) has found that in mice there is some sort of adaptive mechanism resulting in increased histamine formation in the skin after the animals have been exposed to cold. In cold urticaria such a possible mechanism may be exaggerated for some reason or other.

SUMMARY

The urinary excretion of histamine and of its two main metabolites was found to be increased to about the same extent during attacks in a case of cold urticaria.

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