

URTICARIA, ANGIOEDEMA

## HIGH HISTAMINE CONCENTRATIONS IN HUMAN SWEAT IN ASSOCIATION WITH TYPE I ALLERGY TO SEMI-PURIFIED SWEAT ANTIGEN

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**Introduction:** Cholinergic urticaria (CholU) is characterized by pruritic pinpoint-sized wheals under sweating conditions. Histamine is considered as an important mediator to develop wheals, but histamine in sweat has never been examined in CholU.

**Objective:** To elucidate a role of sweat histamine in wheal formation of CholU.

**Materials and Methods:** Sweat samples were collected from nine patients with CholU and 10 healthy controls after exercise or in sauna. Histamine in sweat and blood was measured by high-performance liquid chromatography. The concentrations of sweat histamine were compared with histamine concentration to induce skin reactions by intradermal injection, as well as the release of histamine from basophils in response to the semi-purified sweat antigen.

**Results:** Histamine concentrations in sweat of patients with CholU and healthy donors were  $533.2 \pm 405.6$  ng/mL and  $147.9 \pm 100.3$  ng/mL with no significant difference. They were higher than the concentration of plasma histamine in healthy subjects,  $0.89 \pm 0.18$  ng/mL. In four patients with CholU and three controls, sweat histamine concentrations were higher than the minimum concentration to induce flare at the site of intradermal injection ( $\geq 100$  ng/mL). In a patient with CholU and a control, they were high enough even for wheal induction ( $\geq 1000$  ng/mL). Moreover, there was an apparent correlation between histamine release from the subjects' basophils in response to the semi-purified sweat antigen, and histamine concentration in sweat of both patients with CholU and healthy controls.

**Conclusions:** Both patients with CholU and healthy subjects showed high concentrations of sweat histamine to induce skin reactions by intradermal injection. The individuals with hypersensitivity to the sweat antigen (i.e. sweat allergy) tended to show higher concentration of sweat histamine than those without sweat allergy. The increased histamine activity in sweat may be involved in the pathomechanism of CholU in association with sweat allergy.