Introduction:
Histamine plays an important role in the development of anaphylaxis. Although histamine is promptly degraded because of its short half-life in plasma, basophils, which release histamine, remain in the blood for days. The aim of this study is to evaluate the intracellular histamine concentration and the degree of basophil activation in anaphylaxis patients.

Methods:
We conducted a case-control study enrolling anaphylaxis patients and healthy controls. The amounts of histamine were measured using high performance liquid chromatography. Basophil activation was evaluated by flow cytometry using up-regulation of CD203c expression.

Results:
We enrolled 25 patients and measured their blood histamine concentration. Basophil activation was analyzed in eight of 25 patients. The median intracellular histamine concentrations at admission were significantly lower in patients compared with controls (16.4 ng/mL [interquartile range {IQR}, 2.16 to 32.3] vs. 62.3 ng/mL [IQR, 46.0 to 85.1]; \(p<0.0001\)). The median basophil number at admission was also significantly lower in patients compared with controls (2.10 cell/\(\mu\)L [IQR, 0.74 to 10.3] vs. 21.0 cell/\(\mu\)L [IQR, 19.5 to 28.9]; \(p=0.017\)). CD203c expression was not up-regulated in any of the eight patients in vitro, but it was up-regulated in response to anti-IgE stimulation in vitro in three patients at admission and five patients at follow-up.

Conclusion:
Anaphylaxis is associated with a decrease in intracellular histamine, a reduced number of peripheral basophils and impaired basophil function.