A PILOT STUDY PHENOTYPING BASOPHILS IN CHRONIC SPONTANEOUS URTICARIA

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Background: Chronic Spontaneous Urticaria (CSU) is defined as the occurrence of spontaneous wheals, angioedema or both for more than 6 weeks. In most instances it is a self-limiting condition, lasting for 2 to 5 years. Although mast cells, basophils, autoantibodies and the coagulation cascade seem to be involved, their possible interplay in CSU is unknown as is the exact pathogenesis of the condition. Several studies provided suggestive evidence for the relevance of basophils in the CSU e.g. altered responsiveness towards IgE mediated stimulation, lowered peripheral cell number (basopenia) and increased ability to migrate to the skin wheals, however the thorough surface and intracellular investigation of the resting or activated basophils has not been described. Hence, we hypothesize that comprehensive characterization of basophils will clarify their role and significance in CSU pathogenesis and allow for an identification of predictors of the clinical response to Omalizumab (OMZ) treatment.

Objective: To preliminary characterize an activation status and skin homing potential of basophils in CSU patients clinically in control with OMZ by investigating the expression of cell surface receptors of patients and healthy subject.

Method: Peripheral whole blood samples have been obtained by venipuncture from two female CSU patients and from one healthy subject. The patients have been receiving Omalizumab injection of 300 mg every 6 weeks. Phenotypic profile of basophils was assessed by a flow cytometric assay, namely a modified basophil activation test, that besides the identification (CCR3 and CRTH2) and activation markers (CD63, CD69 and CD203c) also included skin homing receptors CCR6, CCR8, CLA and scavenger receptor CCX-CKR. The phenotypic and functional profiles of basophils were compared between IgE activated and resting conditions. Blood has been handled within 4 hours after collection.

Results: Basopenia was not observed in CSU patients as compared to the healthy subject. In all subjects the blood basophil number constituted between 0.28 – 0.30 % of leukocytes. At resting condition basophils from the healthy subject did not express the activation markers, CD63 and CD69, which however, were seen on basophils (10-11%) from CSU patients (10-11%). Interestingly, the baseline expression of CD203c in both groups was not changed (MFI range 282-385). Moreover, no difference in expression of skin homing receptors (CCR6, CCR8, CLA, and CCX-CKR) was found between the CSU patients and healthy control. Activation of basophils via the IgE pathway resulted in enhanced expression of CD63 and CD203c in both groups, whereas increased expression of CD69 was only observed in CSU patients. Subsequently, an augmented expression of CCR6 and decreased level of CLA were seen in CSU patients. No difference was found in the expression of CCR8 and CCX-CKR.

Conclusion: In this pilot study we were able to observe an altered expression of activation and skin homing markers on CSU basophils, suggesting that the resting and activated profiles of basophils differ from the profile of healthy individuals, which might be an effect of the Omalizumab treatment. Nevertheless, further testing with higher number of CSU and healthy individuals and with enhanced set of surface markers is required.