Sulphidoleukotriene and Histamine Releasability in Atopic Patients

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In 1977, Conroy et al. [1] defined releasability as the ability of the basophil to release mediators in response to antigen or anti-IgE stimulus. This releasability implies that some biochemical events determine the basophil to release mediators in response to an activator [2-41.

In this study, we evaluated the releasability of cellular mediators in atopic patients by means of in vitro quantita-tion of sulphidoleukotriene (sLT) production and histamine release in whole blood after stimulus with antigen and anti-IgE antibodies.

We studied 92 atopic patients sensitive to Dermatopha-goides pteronyssinus (n = 62) or to Lolium perenne (n = 54), diagnosed by skin tests and specific IgE quantification (CAP FEIA Pharmacia, Uppsala, Sweden). We also studied a control group of healthy donors (n = 12).

In vitro production of sLT in the presence of IL-3 was measured after stimulus with an anti-IgE monoclonal antibody (Le27; Bühlmann, Basel, Switzerland), as well as after antigenic stimulus with D. pteronyssinus and L. perenne extracts (at 2 and 20 ng/ml). Leucocytes obtained from peripheral blood after dextran sedimentation were incubated with antigen or anti-IgE antibody (40 min at 37°C), and sLT was quantified in the supernatants with CAST (Cellular Assay Stimulation Test, Bühlmann).

Histamine release was determined with the fluorometric method of Shore, automated by Siraganian, in a Bran-Lüb be Analyzer. The whole blood was incubated with polyclonal anti-IgE (Caltag, South San Francisco, Calif, USA) at 4.2 µg/ml and with D. pteronyssinus and L. perenne at the same concentrations as above.

2,000 -↑
1,500 -
p < 0.001
Fig. 1. sLT production after stimulus with anti-IgE.
We found an IgE-dependent sLT production in response to anti-IgE antibodies; this response was higher in atopic patients than in controls (p < 0.001; fig. 1). We also found a positive and significant correlation between IgE-dependent and antigen-specific releasability. This releasability was higher in sLT production (r = 0.8; p < 0.001; fig. 2) than in histamine release (r = 0.5; p < 0.001). We also noticed a positive and significant correlation between specific histamine release and specific sLT production (r = 0.67; p < 0.001; fig. 3).
Ag-specific histamine release

Fig. 2. Correlation between antigen (Ag)-specific and IgE-dependent sLT production.

Fig. 3. Correlation between antigen (Ag)-specific histamine and sLT release after stimulus with L. perenne 2 ng/ml.

On the other hand, the highest specific sLT production was attained at 20 ng/ml for D. pteronyssinus and at 2 ng/ml for L. perenne.

IgE-dependent releasability decreases with patient’s age, in sLT production as well as in histamine release.

We conclude that the quantification of sLT production after anti-IgE stimulation is a useful method to study cellular releasability and, in addition, that such releasability is higher in atopic patients than in healthy donors.

References


