BAFF and PAF: assessing long term stability in dried blood samples

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Aims: The aim of this study is to evaluate the degradation over time of B Cell Activating Factor (BAFF) and Platelet-Activating Factor (PAF) in collected dried blood, evaluating the differences between two kinds of sample collectors: Whatman 903 Neonatal card (CARD) and Copan Nylon Swab (SWAB).

Methods: A dried blood spot is a common, moderately-invasive method for collecting patient blood from finger pricks. The blood samples are collected from 18 individuals. The collection of the samples is carried out in triplicate for both devices. Samples were stored at room temperature in the dark until serum extraction and analysis. Samples are assayed by Enzyme-Linked Immuno-Sorbent-Assay (ELISA) for BAFF (R&D Systems) and PAF (Elabscience). Serum extraction and ELISA assay were carried out 2 days (T2), 7 days (T7), 14 days (T14), 21 days (T21) and 28 days (T28) after collection. Results were presented as mean ± SEM.

Results: PAF values were stable over the time up to 21 days both for CARD and SWAB. At 28 days there was a reduction of up to 54.3 ± 6.76% for SWAB and up to 36.6 ± 5.5% for CARD (p < 0.001). As regards BAFF, values were stable until T21 while at T28 there was a decrease of up to 77.1 ± 6.3% for SWAB and up to 63.7 ± 4.5% for CARD (p<0.001).

Discussion: According to Finkelman, there is a pathway of activation of immune system mediated by IgG, FcγRs, macrophages, and PAF. BAFF is a member of the tumor necrosis factor superfamily and an important regulator of peripheral B cell survival, maturation and immunoglobulin class-switch recombination. Many studies suggest that BAFF might modulate immune inflammation and could probably be one of the cornerstones of this IgG pathway of immune reaction. BAFF and PAF have both already been linked in non-atopic subjects to food reactions, supporting the possibility that these inflammatory molecules could be involved in non-IgE-mediated allergic reactions.

Conclusion: The data presented in this study should be considered for both clinical and research applications. The higher degradation of PAF compared to BAFF could be attributed to the different chemical nature of these two inflammatory molecules, lipid and protein respectively. The degradation over time of BAFF and PAF also depends on the type of technological support used for the collection of the specimen. Samples should be analysed as soon as possible and no later than 21 days from the time of collection to ensure greater stability of the values.