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Identification of patients affected by hidradenitis suppurativa and inflammatory bowel disease overlap using type VII collagen biomarkers

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Introduction & Objectives:

Patients with hidradenitis suppurativa (HS) have more than double the risk of being diagnosed with inflammatory bowel disease (IBD), such as Crohn's disease (CD) and ulcerative colitis (UC), compared to individuals without HS. Type VII collagen is synthesized by keratinocytes and fibroblasts and is crucial for the function and stability of the extracellular matrix, connecting the epidermal basement membrane to the dermis. In addition to its presence in the skin, type VII collagen has also been linked to the pathogenesis of IBD, especially CD. We investigated novel blood-based biomarkers of type VII collagen in serum from healthy controls, and HS patients with or without IBD, with the aim to investigate the biomarker's ability to identify patients with HS+IBD overlap.

Materials & Methods:

Blood samples from 430 HS patients, 387 without IBD (mean ±SD age 39.64 ±14.06, 67.7% female), 31 with HS+CD (mean ±SD age 42.83 ±14.34, 51.6% female), 12 with HS+UC (mean ±SD age 33.73 ±19.75, 91.7% female), totaling 43 with HS+IBD (mean ±SD age 40.23±16.35, 64.3% female, and 26 healthy donors (mean ±SD age 42.62 ±10.53, 50% female), were collected. The two biomarkers C7M and PRO-C7, measuring degradation and formation of type VII collagen, respectively, were measured in serum from all subjects. Statistically significant differences between groups were calculated by ANCOVA, corrected for Hurley stage, age, and sex.

Results:

C7M and PRO-C7 were both significantly upregulated in patients with HS, HS+CD, HS+UC and HS+IBD, compared to healthy controls (all $p<0.0001$, Figure 1). No differences were found between HS patients with or without IBD for C7M, while PRO-C7 showed significantly higher levels in patients with HS+CD and HS+IBD compared to the patients only having HS (both $p<0.0001$). In an AUROC analysis, PRO-C7 showed a separation between HS and HS+CD with an AUC=0.862, $p<0.0001$, and between HS and HS+IBD an AUC=0.821, $p<0.0001$, while no difference was found between HS and HS+UC.

Conclusion:

Formation of type VII collagen, quantified by PRO-C7, is significantly elevated in patients with HS+CD overlap, compared to HS alone, which indicates an excessive collagen production. Such biomarker could potentially be used to identify patients affected by both manifestations, and guide treatment decisions.

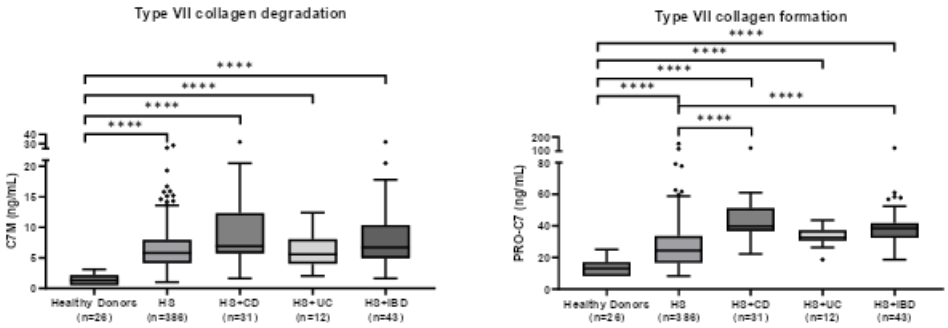

Figure 1. Biomarker levels of type VII collagen degradation (C7M) and formation (PRO-C7). Data are plotted as Tukey Box-plots and analyzed by an analysis of covariance (ANCOVA) corrected for

Hurley stage, age, and sex.