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B-Cells in Immune Mediated Glomerular Diseases

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Objectives : The dysregulation of B-cells is thought to play a critical role in immune mediated glomerular diseases (IMGD). However, the phenotypic profiles of IgA and IgG cells in IgA nephropathy (IgAN), membranous nephropathy (MN), focal segmental glomerular sclerosis (FSGS), and minimal change disease (MCD) have not been evaluated in detail. Phenotypic analysis of the B-cell populations has the potential to identify how the B-cell response is dysregulated in IMGD.
Methods : We studied IgAN (n=10), MN (n=7), FSGS (n=8), and MCD (n=7) patients and healthy controls (HC, n=10). Using a spectral flow cytometry approach, we analyzed the peripheral blood mononuclear cell populations to identify the myeloid cell, T-cell populations, and B-cell populations including the IgA and IgG antibody secreting cells and memory cell populations. Flow cytometry data was analyzed using Flow Jo software.
Results : Using spectral flow cytometry we evaluated the B-cell populations in IgAN, MN, FSGS, MCD, and HC. No significant differences were observed in the IgA and IgG memory B-cell populations. No significant differences were observed in the IgG antibody secreting cells. However, a significant increase in the IgA^+ antibody secreting cells was observed in the peripheral blood of IgAN patients compared to MN, FSGS and MCD patients and HC ($P < 0.01$, one way ANOVA). Analysis of the IgA^+ antibody secreting cell populations demonstrated there was a $CD95^{low}$, $CXCR3^+$ sub-population which was unique to IgAN patients, and absent in MN, FSGS, and MCD patients, and HC. Analysis of the IgG antibody secreting cell populations demonstrated there was a $CD95^{low}$, $CXCR3^+$ sub-population which was unique to MN patients, and absent in IgAN, FSGS, and MCD patients, and HC.
Conclusions : Our data demonstrated unique phenotypic profiles of the antibody secreting cells in IMGD, potentially revealing the functional activity of these cells which needs to be experimentally validated.