SPONTANEOUS CLEARANCE OF *CHLAMYDIA TRACHOMATIS* INFECTION IS CHARACTERIZED BY DISTINCT DIFFERENCES IN INTERFERON-GAMMA-PRODUCING MEMORY CD4-T CELL POPULATIONS

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Background:
Murine models show that clearance of *Chlamydia trachomatis* (CT) is mediated by interferon-gamma (IFNγ)-producing CD4+ T-cells. In women, spontaneous clearance of CT infection is found in approximately 20% of women on returning for treatment of a positive test and may indicate development of immunity. We hypothesized that spontaneous clearance in women would be associated with an increase in IFNγ-producing memory T-cell responses compared to women with persisting infection.

Methods:
We enrolled women returning for treatment of a recent positive CT NAAT. Repeat CT NAAT differentiated women as having spontaneous clearance (NAAT-negative) versus persisting infection (NAAT-positive). Peripheral blood mononuclear cells from 114 matched women who spontaneously cleared (N = 57) or had persisting CT infection (N = 57) were stimulated with CT antigens and intracellular levels of IFNγ were measured by intracellular cytokine staining and flow cytometry. Memory CD4+ T-cells were defined as naïve T-cells ($CD45RO^{lo}/CCR7^{hi}$), central memory T-cells ($CD45RO^{hi}/CCR7^{hi}$, effector memory T-cells (Tem, $CD45RO^{hi}/CCR7^{lo}$) and terminally differentiated effector memory T-cells ($CD45RO^{lo}/CCR7^{lo}$). Significant associations were evaluated by Mann-Whitney or Kruskal-Wallis. Significance was defined as $p < 0.05$.

Results:
Comparing women with spontaneous clearance versus persisting infection, no difference in frequency of specific memory T-cell subpopulations or percent IFNγ-producing T-cells was found. Comparing IFNγ-producing T-cell responses across memory populations by clearance outcome, there was a significant difference in distribution of IFNγ-producing T-cells in women with spontaneous clearance ($p = 0.017$), but not persisting infection; this difference was driven by an almost 4-fold increase in IFNγ-producing Tem T-cells (25% vs 7% in Tcm T-cells, $p = 0.02$).

Conclusion:
Women who spontaneously cleared CT had a significant increase in the proportion of IFNγ-producing effector memory T-cells, suggesting that a critical threshold of effector T-cells may be required to effectively traffic to the genital tract and confer protection against CT.

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