INVESTIGATION OF SYSTEMIC INFLAMMATORY RESPONSE IN FIRST TRIMESTER PREGNANCY

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Background: The contribution of local and systemic inflammation to the pathophysiology of sporadic first trimester miscarriages remains unclear. The objective of this study was to investigate the inflammatory response in the circulation of women presenting with first trimester miscarriage.

Methods: Levels of tumour necrosis factor alpha (TNFα), TNF receptors 1 and 2, interferon gamma (IFNγ), interleukin (IL)-6 and IL-10 were assayed using cytometric bead arrays in plasma samples from 29 euploid and 21 aneuploid missed miscarriages, 35 normal pregnant controls and 31 non-pregnant women. Whole blood flow cytometry was carried out with samples from 17 euploid and 16 aneuploid miscarriages, 18 pregnant controls and 13 non-pregnant women.

Results: The plasma of women with euploid miscarriage contained significantly higher circulating levels of TNFα (p<0.005), IFNγ (p<0.005), IL-6 (p<0.005) and IL-10 (p<0.01) than that of pregnant controls, irrespective of gestational age. Significantly (p<0.05) higher TNF-R1 levels at 6-9 weeks, and significantly higher TNFα/IL-6 (p<0.001) and significantly lower TNFα/IL-10 (p<0.001) and IFNγ/IL-10 (p<0.001) ratios at 10-14 weeks, were also found in euploid miscarriage cases compared with pregnant controls. TNFα/IL-10 ratio in plasma was significantly (p<0.05) lower in miscarriages with an abnormal karyotype than those with normal karyotype. Normal pregnant women had a significantly higher plasma level of IFNγ (p<0.01) and IFNγ/IL-10 ratio (p<0.005), a significantly (p<0.005) lower TNF-R1 level, and a significant (p<0.05) increase in stimulated TNFα in monocytes, compared to non-pregnant women.

Conclusion: Our data confirms that there is an inflammatory reaction in normal pregnancy compared to the non-pregnant state, which may be disrupted during miscarriage.