Increased serum IFN-γ in women with a history of repeated implantation failures after in vitro fertilization and embryo transfer

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Objective: To compare serum cytokines, including interferon-γ (IFN-γ), tumor necrosis factor-α (TNF-α), interleukin-4 (IL-4) and IL-10, between non-pregnant women with repeated implantation failures (RIFs) after in vitro fertilization and embryo transfer (IVF-ET) cycles and those with normal fertility during late follicular phase.

Methods: Serum levels of IFN-γ, TNF-α, IL-4 and IL-10 in 24 women with RIF and 40 women with normal fertility were measured using Luminex-based cytokine assays.

Results: A significantly higher serum level of IFN-γ was observed in women with RIF (median = 38.50 pg/mL, interquartile [IQ] range 2.44-86.73 pg/mL) than in controls (median = 2.44 pg/mL, IQ range 2.44-47.01 pg/mL, p<0.05). A significantly higher IFN-γ/IL-4 ratio was observed in women with RIF (median = 7.7, IQ range 1.0-21.1) than in controls (median = 2.9, IQ range 1.0-8.4, p<0.05).

Conclusion: A significantly higher serum IFN-γ and IFN-γ/IL-4 ratio in women with RIF after IVF-ET cycles might suggest skewed Th1 immune status was possibly associated with the pathogenesis of implantation failures.

Key words: Serum cytokines, repeated implantation failure, in vitro fertilization

Introduction

Human in vitro fertilization (IVF) and embryo transfer (ET) are accompanied by a low implantation rate even after a very successful IVF, and there are a certain number of idiopathic sterilities which are due to repeated implantation failures. This failure may be due to either a defect in implantation, as no human chorionic gonadotrophin (hCG) production is ever detected, and there can be occult pregnancy loss occurring after a transient detection of hCG production following an immediate drop in hormone levels which is evidence of early pregnancy loss. Early pregnancy losses are likely to differ from a constitutive abortion, and even recurrent immediate post implantation failures are likely to differ from recurrent spontaneous abortion.

The actions of cytokine are associated with most processes in the body, including immune function and implantation [1]. Among their major regulatory functions, cytokines participate in differentiation of naïve T-helper cells into T-helper type (Th)-1 cells, or...