Risk factors for multiple gestation in women undergoing intrauterine insemination with ovarian stimulation

EB Pasqualotto, T Falcone, C Petrauskis, J Goldberg, DR Nelson, and A Agarwal, Center for Advanced Research in Human Reproduction and Infertility, Departments of Gynecology-Obstetrics, Urology, and Biostatistics and Epidemiology, The Cleveland Clinic Foundation, Cleveland, OH

Objectives: We sought to identify whether post-wash sperm characteristics and/or ovulation induction cycle characteristics can predict the occurrence of multiple conception in patients after ovarian stimulation and intrauterine insemination (IUI).

Design: Retrospective study.

Material and Methods: The medical records of 162 pregnant women who underwent ovarian stimulation and IUI with their partner’s sperm at the Cleveland Clinic Foundation from January 1993 through December 1997 were reviewed in this retrospective study. Couples with ectopic pregnancies, incomplete data, who did not achieve pregnancy, or who did not undergo ovarian stimulation with clomiphene citrate or human menopausal gonadotropin (hMG) were excluded from analysis (n = 36). The relationship between patient characteristics, ovarian stimulation, and post-wash sperm characteristics to multiple pregnancy were evaluated.

Results: Comparison of the multiple (n = 100) and single (n = 22) conceptions showed that the mean serum estradiol (E₂) levels on the day of human menopausal gonadotropins injection were significantly higher in the multiple conception group (p = 0.01). Patients in both groups received similar amounts of hMG for comparable intervals. The post-wash total sperm count, total motile sperm count and sperm motility did not differ between groups. However, patients with multiple pregnancies underwent IUI with significantly higher curvilinear velocity (p = 0.04), sperm linearity (p<0.001), and amplitude of lateral head movement (ALH, p <0.001) than patients with single pregnancies. A peak serum E₂ level greater than 583 pg/mL on day of hCG injection and post-wash ALH greater than 4 µm/sec predicted multiple pregnancies. Considering ALH less than 4 µm/sec and excluding serum E₂ levels from the analysis, number of follicles (determined by transvaginal ultrasound) greater than 11 mm significantly correlated with multiple gestations.

Conclusion: In our study: 1) Post-wash ALH greater than 4 µm/sec and serum E₂ greater than 583 pg/mL were significant risk factors for multiple pregnancy, 2) the ability of the ovaries to respond to exogenous stimulation is one of the decisive factors in multiple pregnancy and the monitoring of ovarian response by serum E₂ was better predictor for multiple pregnancy than ultrasound monitoring the follicle number and size, 3) the total sperm count, total motile sperm count and sperm motility were not correlated with multiple pregnancy, and 4) the probability of fertilization of more than one oocyte most likely is primarily related to the functional characteristics of the sperm available, once several fertilizable oocytes are released in patients with ovarian stimulation therapy.