WHAT CAN BE DONE TO IMPROVE OUR ART OUTCOME: THE AMERICAN AND THE EUROPEAN EXPERIENCE.

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Over the past two decades we have witnessed remarkable improvements in success rates following in vitro fertilization. Recently, in a quest to identify factors responsible for these improvements, several authors have attempted to compare the quality of ART programs in the United States, Europe and Australia/New Zealand. However, comparing success rates between clinics, countries, regions or continents is futile. For one, there are great differences and variations in the practice of ART and some of these factors are not readily comparable and are difficult to validate. These include, but are not limited to, patient selection based on age, ovarian reserve, previous failed IVF attempts, embryo stage at transfer as well as IVF laboratory techniques.

Although many attribute improvements in IVF success exclusively to innovations in the laboratory, one cannot overemphasize that refinements in our approach to and optimization of ovarian stimulation protocols, improved methods of patient evaluation and selection as well as gained insights into the importance of endometrial-embryo synchrony have all played critical roles. Moreover, the developments of sophisticated embryo culture media and the use of endometrial cell-embryo co-culture techniques have allowed for the selection of the "best" embryos for transfer. Although, many factors have contributed to IVF success, this discussion will focus on patient selection, optimization of ovarian stimulation protocols and embryo selection.

Experience has shown that a philosophy which encompasses individualized, moderate ovarian stimulation protocols yields the best outcomes. This approach involves not only choosing the appropriate gonadotropin dose, but also careful monitoring of follicle growth and serum estradiol levels, adjustments of gonadotropin dosage to avoid hyperresponse and precise timing of the ovulatory trigger with either human chorionic gonadotropins (hCG) or a GnRH agonist. Such an intensive monitoring approach during ovarian stimulation results in improved oocyte and embryo quality and higher implantation and pregnancy rates. Most importantly, this regimen reduces the incidence of complications, especially ovarian hyperstimulation syndrome.

Oocyte and embryo quality arguably account for approximately 80% of IVF success and should be the primary focus for improving outcome. One laboratory technique for optimizing embryo quality has been the human endometrial-embryo co-culture system. This technique endeavors to mimic the in vivo conditions normally encountered by the embryo and has resulted in improved implantation rates.

Prolonged embryo culture to day 5 has allowed for selecting the "best" embryo for transfer. Indeed, choosing a single blastocyst for transfer has been one approach utilized to increase implantation rates and reduce multiple pregnancies.

Ultimately, identifying embryo viability by either morphological, biochemical or genetic markers may allow for the selection of the single best embryo for transfer. To date, no such marker has proven to be sufficiently reliable.

In conclusion, IVF success is dependent upon a careful and individualized approach to ovarian stimulation, improved embryo selection and optimization of endometrial receptivity.