How Should We Deal with the Barrage of New Infertility Treatments and Innovative Technologies?

Starting in 1970s as experimental procedures following numerous trial-and-error processes, assisted reproductive technologies (ART) have developed extensively through the past three decades. Following the successful birth of the first IVF baby, ART rapidly developed in both research and clinical practice during 1980s. Then after during1990s, IVF clinics, different ART methods and their success rate extensively increased, along with their widespread popularity. Currently, the changes brought up by the modern lifestyle have lead to increased infertility rates and subsequently increased demand for infertility treatment services and higher numbers of IVF clinics worldwide; therefore, ART is considered to be an industry, the so called IVF industry, in recent times (1).

With the rapid growth of ART as an industry, other related industries such as medical equipment industry and pharmaceutical companies simultaneously developed to support IVF clinics in a way that infertile couples and IVF clinics are continuously exposed to the introduction of new technologies, equipment, drugs and facilities. Therefore, the life span of related equipment and technologies has greatly reduced and has raised the question whether any new technology or equipment should be used in IVF clinics upon its introduction. Noticeably, most of these methods, drugs and equipment are widely used in IVF clinics without the approval of their quality or efficiency or their safety or their proven benefit in infertile couples through comprehensive clinical trials or evidence-based approaches. Embryo culture media, ovary stimulation regimens, intracytoplasmic sperm injection (ICSI), assisted hatching, *in vitro* maturation (IVM) and cytoplasmic transfer are many of these technologies. Dissimilarly, the widespread, rapid and durable application of ICSI methods was achieved by the approval of their safety and efficiency for male and female factor infertility treatment. However, in spite of the long-term use of most others technologies, their safety and performance are questionable and need more medical evidence (2).

Aside from the lack of performance evaluation of these procedures, medications, and equipment, the existing competition between IVF clinics and advertising for attracting more infertile couples have lead to greater interest among most clinics for their use. The major problem associated with the use of these new facilities is a direct increase in cost of infertility treatment. Therefore, infertility has become known as one of the most expensive health care options and due to the partial presence or absence of insurance coverage of these procedures in most countries, many infertile couples are deprived from access to ART services. A detailed analysis of ART cost revealed that controlled ovarian stimulation covered about 70% of the costs per each ICSI cycle due to the price of medications, however, fertilization (IVF laboratory) constituted less than 20% of the total costs of IVF and ICSI cycles (3).

Most new innovative technologies are related to IVF laboratory for increasing the quality and selecting the best embryos. On the other hand, success rate of IVF cycles is less than 50% in spite of improvements during the past three decades. The major cause for this low success rate is related to embryo quality and its ability for leading to a live healthy birth. Therefore, IVF success rates are dependent on repeated treatment cycles, which entail monetary costs and psychosocial burden. Theoretically, every change in IVF setup by using new technologies to increase quality of embryo and implantation rate will reduce the number of IVF cycles and, consequently, lower the total cost of treatment per successful cycles. Therefore, one strategy to reduce the high cost of ovarian stimulation in IVF cycle is oocyte retrieval in a natural cycle without any stimulation or by mild stimulation using clomiphen citrate instead of gonadotropines (4). Although the number of retrieved oocytes is reduced, but advances in embryo lab technology could compensate for the condition and lead to *in vitro* production of high quality embryos and subsequent successful pregnancies. This viewpoint favors cheaper IVF procedures and hopes for its spread around the world, especially in poor and low-income countries.

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