

Editorial

Potential Impact of Environmental Pollutants on *In Vitro* Fertilization (IVF) Treatment

Iman Al-Saleh*

Environmental Health Section, King Faisal Specialist Hospital & Research Centre, Saudi Arabia

***Corresponding author:** Iman Al-Saleh, Environmental Health Section, King Faisal Specialist Hospital & Research Centre, PO Box: 3354, Riyadh 11211, Saudi Arabia

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Utilization of *In Vitro* Fertilization (IVF) treatment is growing exponentially worldwide which for many couples; IVF is their only chance of conceiving a child. However, in many cases the implantation rates following the IVF-embryo transfer is low and reported to be around 24% according to the most recent Assisted Reproductive Technology (ART) success report from USA (<http://www.cdc.gov/art/>). In many times, the IVF takes repeated and costly attempts with traumatic stress and anxiety feelings. There are many physiological and pathological reasons for implantation failure [1]. A review article by Homan *et al.* [2] pointed out to the role of factors such as psychological stress, caffeine consumption, alcohol consumption and exposure to environmental pollutant on infertile population undergoing ART treatment, however the evidence is ambiguous. The authors also stressed that changing lifestyle might assist couples to conceive spontaneously or optimize their chances of conception with ART treatment. Kumar & Mishra [3] reviewed available data and observed less success rate of IVF outcome in couples exposed to some of the reproductive toxic chemicals in comparison to those were not exposed to such chemicals. Though the authors stated that data were very insufficient, they believe that sub-fertile subjects, who are planning to go for the IVF, should adopt a healthy lifestyle as well as the clinician ought to be aware of occupational and environmental exposure history of the participating couple. Many researchers have found that IVF opened a good opportunity to assess the effect of environmental pollutants on early development and pregnancy outcomes that is hard to observe in women conceiving naturally such as fertilization rate, implantation, embryo quality, etc. Recent studies have observed less success rate of IVF outcome in couples exposed to pollutants such as perfluoroalkyl acids [4], heavy metals [5], chlorinated biphenyl 153 and *p,p'*-DDE [6]. In general, toxicity of many pollutants is mediated through oxidative DNA damage resulting from the excessive production of Reactive Oxygen Species (ROS) that could lead to many pathological states,

including pregnancy complications [7,8]. Few experimental and human studies suggested that oxidative stress might affect oocyte *in-vitro* maturation, *in-vitro* culture and sperm preparation techniques leading to the failure of IVF treatment [9-12]. However, one must say that the results remain scarce and inconclusive and studies are needed to understand whether pollutants-mediated ROS production plays a role in the initiation of oxidative DNA damage in sperm and granulosa cells that might affect the success rate of IVF treatment.

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