



Air Pollution and Infertility – A letter to Editor

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Abstract

Air pollution is one of the most important environmental issues in 21 century. It is so essential to understand relationship between air pollution and human health effects. Many air pollutants such as volatile organic compounds (VOCs) have several negative effects on human reproductive system. The objective of this letter to editor is to introduce the fundamental relationship between air pollution and human infertility. An extensive literature review was done to gather a large number of studies on effect of various air pollutants on human reproductive system and then an extended abstract was written as a letter to editor. It is clear that a wide range of air pollutants are able to be effective on human infertility. If the emission of pollutants is not appropriately controlled, the rate of human infertility will be significantly increased in near future.

Keywords: Air pollution, Reproductive system, Infertility

Scientific studies demonstrated that environmental factors have a significant effect on people's health [1]. Notwithstanding the growing interest in evaluating effects of environmental factors on the human health status, higher attention must be focused on evaluating the effects of air pollution on human's health. Nowadays, the air pollution phenomenon is a global issue which is associated to pathogenesis of a vast variety of diseases. The results of studies have showed a statistical association between contacts to air pollutants and the expansion of diseases such as cancer, cardiovascular disease and reproductive system dysfunction [2-6]. Adverse effects of air pollution on the occurrence of health problems have been extracted from a variety of studies evaluated the short and long term exposure of individuals to different level of air pollutants as well as gender specific effects [7]. Air pollutants such as nitrogen oxides (NO_x) or sulfur oxides (SO_x) can produce acid rain and lead to destruction of buildings and machinery, and damage to plants and aquatic ecosystems [8]. Particulate matter which known as PM are another air pollutants that have destructive effects on human respiratory system [9]. Another category of airborne pollutants known as VOCs include hazardous pollutants such as benzene and vinyl chloride, which are poisonous and carcinogenic [11,10].

Hundreds of VOCs are produced by biochemical reactions in landfills and released into the air [12-15]. Millions of tons of VOCs are emitted into the atmosphere annually through the industries, transportation system, fuel distribution, and many other anthropogenic activities. Since people are simultaneously exposed to several pollutants, in

epidemiological studies it is difficult to precisely evaluate the individual role of specific pollutant. Pollutants exert their effects through different mechanisms to destroy physiological functions including reproduction. Studies demonstrated that air pollution has destructive impacts on both male and female reproductive system at the level of tissue structure, function, gametogenesis and even alter the genetic and epigenetic status of produced gametes which at last may affect embryo development and even leads to miscarriage. Although most studies focuses on male gametes due to its easy accessibility, there are some published researches involving females one. Hormonal disturbances, oxidative stress induction, cell DNA and epigenetic alterations, separated or combined, are considered as mechanisms of air pollutants for causing infertility. Reports showed that some of the VOCs such as 1,1,1-trichloroethane, 1,1,2,2-tetrachloroethane, 1,1-dichloroethylene, 1,2-dichloroethane, 1,2-dichloropropane, acrylonitrile, benzene and acetone has several negative effects on the human reproduction system [16]. The effect of indoor and outdoor air pollution on human reproductive system has been an interesting topic for a wide verity of studies and policy analysts [16-18]. Several epidemiological researches can be found that have studied the increased risk of infertility from living in an urban areas due to a higher air pollution exposure [19]. Generally, such studies demonstrate a high risk for infertility problems in urban areas compared to nonurban ones [20]. Such reports emphasize the importance of air pollution control to reduce infertility risk in urban areas. Therefore increasing the awareness of people,

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infertility specialist and public authorities is essential to limit air pollutants and its negative effects on fertility as much as possible.

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