



The Paternal Cause of Abortion from the Viewpoint of Avicenna

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Letter to the editor

Spontaneous abortion or miscarriage is pregnancy loss from the time of conception to 20th week of gestation. It is the most prevalent complication of pregnancy with a growing frequency [1].

If we add the loss of unrecognized or subclinical pregnancies into abortions after the clinical diagnosis of pregnancy, more than 50 to 60 percent of the conceptions are excreted, while the cause of 50% is not known. Approximately, 10–20% of women experience a non-consecutive spontaneous abortion at some time during their reproductive years. About 0.5–1% of pregnant women go through two or more consecutive pregnancy losses, a situation known as recurrent pregnancy loss (RPL) or “Habitual

Abortion” [2].

RPL is a multifactorial problem and needs careful attention and investigation. In modern medicine, the etiology of RPL is classified into maternal and paternal causes. The primary focus is on maternal causes, including genetics, endocrinological, anatomical and autoimmune disorders, infections, and systemic maternal diseases [2].

Recently, more attention has been paid to paternal factors. Recent studies on paternal causes have yielded interesting results. It has become known that karyotype abnormalities within each of the parental units will lead to miscarriage. Morphology, motility, and genetic abnormalities in sperms, hypo-osmotic swelling, acrosomal status and viability of sperms, and seminal

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leukocytes are other suggested but controversial paternal factors [3].

Persian medicine (PM) is based on the theory of elements, humor and temperaments.

Among the outstanding physicians and scientists of the Islamic golden era, Avicenna [Ibn-e-Sina (980-1037 AD)] is acknowledged as a prominent master. PM is known in most of the world by the name of Avicenna and his encyclopedic book, *Qanun fi al-Teb* (Canon of Medicine). The Canon of Medicine was translated into Latin towards the end of the 12th century CE and became a reference source for medical studies in European universities until the end of the 16th century [4].

One part of this book is dedicated to the topic of "Esghat" which is equal to abortion. In this part, the etiology of abortion has been classified into external, maternal, paternal and fetal causes. The paternal cause of abortion is noted especially in early and recurrent abortions. Avicenna believed that the development of the fetus and initiation and continuation

of pregnancy is based on the normal semen of male and female. Any dystemperament (Su-e Mizaj) or other abnormalities in the semen were believed to be the cause of abortion. Avicenna explained three membranes surrounding an embryo. The outermost layer contributes to the formation of the placenta. This layer was called "Mashimye" in the Persian medicine, which seems to be equal to chorion. He believed that semen is the first important factor in forming the Mashimye. Regarding the important role of Mashimye in the maintenance of the fetus and the role of semen in the development of Mashimye, semen abnormalities were believed to be a cause of abortion in the early months of pregnancy. Avicenna highlighted the role of semen dilution in early miscarriage. He stated that the dilution of the semen leads to an imperfect or weak first membrane (Mashimye), ready to be penetrated on impulse or upon other minor

causes [5].

The contribution of male factors to implantation failure has been suggested by recent literature [3]. Evidence for the effect of paternal genome in early embryonic development is increasing. Nowadays, we know that the paternal genome underlies the centrosome in the first mitotic division after fertilization [6].

Links have been found between sperm quality and the embryo's ability to reach the blastocyst stage and progress to implantation. In addition, it has been known that paternally expressed genes modulate the proliferation and invasiveness of trophoblast cells and later placenta [7]. Animal studies have emphasized that embryos created using two male gametes (androgenodes), mainly have a placenta with little or no embryo, whereas pregnancy conceived from two female gametes (gynegenodes) results in an embryo with no or very little placenta. Based on modern enquiries, it is obvious that sperms have an impact on implantation, placental proliferation, placental vascularization, and placental quality. Therefore, sperms have an important role in miscarriage [8].

The fact that Avicenna explained such an interesting result about the male factor of miscarriage about 1000 years ago represents the ingenuity of this great scientist. In the knowledge of Persian medicine, there are some useful recommendations for this problem, which are hoped to be the topic of future investigations.

Conflict of Interest

None.

Acknowledgment

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