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# SMOKING AS A FACTOR IN MALE AND FEMALE INFERTILITY

**Annotation:**Cigarette smoking has many well-known side effects. The link between cigarette smoking and infertility has been studied for decades; however, large-scale prospective population-based studies are lacking. This article examines the effects of smoking during pregnancy on future fertility, male infertility, and the effects of second-hand smoke.

**Keywords:**smoking, male infertility, female infertility, in vitro fertilization.

Most people understand that smoking increases the risk of heart disease and respiratory disease. Many do not realize that smoking can also lead to infertility problems in both men and women. Chemicals such as nicotine, cyanide, and carbon dioxide in cigarette smoke increase the likelihood of egg loss. Unfortunately, once an egg dies, it cannot be restored or transferred. This means that menopause occurs 1 to 4 years earlier in women who smoke (compared to non-smokers ).

Men who smoke may suffer from decreased sperm quality – having lower sperm counts, having sperm with reduced motility, and having more abnormally shaped sperm. Smoking may also reduce the ability of sperm to fertilize eggs.

Smoking women have lower fertility rates than non-smoking women. Infertility rates for both men and women are almost twice as high as non-smokers. The risk of infertility increases as daily cigarette consumption increases. Even IVF, a fertility treatment, cannot completely eliminate the negative effects of smoking. Smokers require more ovarian stimulation drugs during IVF, and they still have fewer eggs during the retrieval procedure, and the chances of pregnancy are 30% lower than in non-smoking patients who have undergone IVF.

Men whose mothers smoked half a pack of cigarettes a day (or more) have lower sperm counts. Smoking during pregnancy can also cause intrauterine growth restriction in the baby. Low-birth-weight babies are at risk for health problems later in life ( such as diabetes, obesity, and heart disease). Children whose parents smoke are at increased risk for sudden infant death syndrome (SIDS) and asthma.

It is estimated that more than one-third of all men worldwide smoke some form of tobacco and that 21.6% of American men smoke cigarettes. Smoking is associated with a variety of adverse health effects, including cardiovascular disease, respiratory disease, and cancer of the lung, bladder, cervix, esophagus, kidney, pancreas, and stomach. Recently, researchers have begun to study the relationship between cigarette smoking and reproductive health. For example, the American Society for Reproductive Medicine defines infertility as the inability to become pregnant after 12 months of regular unprotected intercourse. It is estimated that up to 15% of all couples trying to have children experience some form of infertility. Although nearly half of all cases of infertility are due solely to female factors, male factors are the sole etiology in about 30% of couples. An additional 20% of infertile couples have a combination of male and female factors. Thus, male infertility plays a significant role in 50% of all couples experiencing infertility. In addition to the effects of cigarette smoking on the man's sperm parameters, smoking in utero may affect the man's eventual fertility in

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the future. Although research in this area is limited given the need for long-term follow-up, several important findings are known. Smoking is not a risk factor, but it can still be considered in isolation. Because smoking destroys the genetic material of eggs and sperm, the miscarriage rate and birth defect rate are higher in children of patients who smoke. Smokeless tobacco also increases the risk of miscarriage. Women who smoke are more likely to conceive a child with an abnormal number of chromosomes (e.g., Down syndrome) compared to nonsmokers . Ectopic pregnancies and premature births are also more common in women who smoke.

Paternal direct smoking often leads to maternal second-hand smoking, which may have further detrimental effects on female fertility. One retrospective study of 225 women undergoing IVF/ICSI found that women exposed to second-hand smoke had implantation rates similar to those of women who directly smoked (12.0% vs. 12.6%) and were significantly lower than the implantation rate of unexposed women (25.0% ) . Similarly, women exposed to second-hand smoke had significantly lower pregnancy rates than women who were not exposed to cigarette smoke (20.0% vs. 48.3% ) . Although data examining the direct effects of second-hand smoke on women attempting to conceive naturally are limited, this exposure may reduce the likelihood of pregnancy through adverse effects on both male and female factors.

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