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Paternal Exposures and Pregnancy

This sheet talks about the risks that paternal exposures can have during pregnancy. With each pregnancy, all women have a 3% to 5% chance of having a baby with a birth defect. This information should not take the place of medical care and advice from your health care provider.

What is a “Paternal Exposure”?

A paternal exposure is anything the father of the baby is exposed to before conception or during his partner’s pregnancy. Examples include recreational drugs, alcohol, cigarette smoking, chemotherapy or radiation treatments, environmental or occupational exposures, and prescription or over-the-counter medications.

Do paternal exposures cause any problems related to pregnancy?

Yes. Certain exposures may affect a man’s ability to father a child by changing the production, size, shape, or performance of sperm. Such changes may cause infertility, delay in getting his partner pregnant, or early pregnancy loss. Data from animal and human studies suggest that paternal exposures may cause genetic changes in sperm which may cause an embryo to fail to develop or cause an increased risk for childhood cancers in an exposed man’s children.

Do paternal exposures cause birth defects?

Agents that may cause birth defects do not reach the developing fetus through the father as they do from the pregnant woman. Substances that a father is exposed to may be found in small amounts in the semen, but there is no evidence that these small amounts interfere with normal fetal development. Currently, there is no evidence that paternal exposures increase the risk of birth defects. However, further study is needed in this area.

Can recreational drugs, if used by the father, affect my pregnancy?

These substances may be found in the semen. Recreational drug use may affect sperm quality or provide limited direct exposure to the developing fetus. However, there is no clear evidence that birth defects may result from the use of these substances by the father.

Can alcohol use by the father affect my chances of getting pregnant or affect the baby during pregnancy?

Heavy alcohol use in males may affect sperm formation and function, or may cause impotence. Whether a father’s alcohol use increases the risks for birth defects is still being investigated. A recent study suggested that paternal alcohol use may be associated with an increased risk for certain rare heart defects in newborns. More information is needed in this area before a conclusion can be made.

What if the father of the baby smokes cigarettes?

Paternal smoking has been associated with small reductions in sperm quality, but there have been no reports of reduced fertility due to smoking in men. A small association between adverse pregnancy effects and paternal smoking, and a slight increase in certain types of cancer in offspring of smoking fathers has been seen. One study on a small number of babies born with rare heart defects found an association with paternal smoking. Additional studies on the effects of paternal smoking on pregnancy outcome are needed.

Can chemotherapy or radiation for cancer treatments given to the father affect my pregnancy?

Sperm production is frequently affected during cancer treatment. Sometimes, sperm production may return to normal after certain chemotherapy or radiation treatments, but it is not guaranteed.

Men who are facing cancer treatment may wish to consider sperm banking prior to starting treatment. It is recommended that men undergoing chemotherapy wait for at least three months after the end of treatment before attempting to father a child. Certain chemotherapy treatments have been shown to increase the chance of having a fetus with more or less than the normal number of chromosomes. Damage to the structure of chromosomes in sperm of cancer patients may also occur. It is believed that most of the damage is not permanent, but some studies have detected higher than normal levels of abnormal sperm years after the end of chemotherapy. At this time, there are no data demonstrating an increase in birth defects in the children of cancer patients.

Can the father's workplace exposures affect my pregnancy?

According to the National Institute of Occupational Safety and Health (NIOSH), a number of workplace substances including lead, organic solvents, pesticides and radiation have been identified as reproductive hazards to men. Some studies in humans suggest that such exposures may be associated with decreased sperm production, increased sperm abnormalities, decreased fertility, and an increased risk of miscarriage in the wives of these workers.

In addition, men exposed to heavy metals, pesticides, and other chemicals in the workplace may carry very small amounts of these agents on their clothes and shoes into the home. This may cause direct exposure of their partner prior to conception or during pregnancy. However, no data are available at this time regarding any increases in birth defects due to such exposures. Further studies are needed in these areas.

Can prescription or over-the-counter medications taken by the father affect my pregnancy?

Paternal exposure to medications prescribed for conditions like high blood pressure or high cholesterol have not been associated with an increased risk of birth defects in the developing fetus. Likewise, over-the-counter medications to treat other conditions have not been associated with an increased risk of birth defects. However, it is important to discuss any concerns you may have with your physician.

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References:

- Brent R, et al. 1993. Ionizing and nonionizing radiations. In: Occupational and Environmental Reproductive Hazards: A Guide for Clinicians, Ed.: Maureen Paul, Williams, and Wilkin. Baltimore, MD.
- Cohen FL. 1986. Paternal contribution to birth defects. Nurs Clin North Amer 21:49-64.
- Colie CF 1993. Male mediated teratogenesis. Reprod Toxicol 7:3-9.
- Correa-Villasenor A, et al. 1993. Paternal exposures and cardiovascular malformations. The Baltimore-Washington Infant Study Group. J Expo Anal Environ Epidemiol Suppl 1:173-185.
- Generoso WM, et al. 1990. Concentration-response curves for ethylene oxide-induced heritable translocations and dominant lethal mutations. Environ Mol Mutagen 16:126-131.
- Generoso WM, et al. 1995. Dominant lethal and heritable translocation tests with chlorambucil and melphalan in male mice. Mutat Res 345:167-180.
- Generoso WM, et al. 1975. 6-Mercaptopurine: an inducer of cytogenetic and dominant lethal effects in premeiotic and early meiotic germ cells of male mice. Mutat Res 28:437-447.
- Hunt PA. 1987. Ethanol-induced aneuploidy in male germ cells of the mouse. Cytogenet Cell Genet 44(1):7-10.
- Jensen BK, et al. 1991. The negligible availability of retinoids with multiple and excessive topical application of isotretinoin 0.05% gel (Isotrex) in patients with acne vulgaris. J Am Acad Dermatol 24:425-428.
- Ji BT, Shu XO, Linet MS, Zheng W, Wacholder S, Gao YT, Ying DM, Jin F (1997) Paternal cigarette smoking and the risk of childhood cancer among offspring of nonsmoking mothers. J Natl Cancer Inst 89:238-244.
- Obe G and Anderson D. 1987. International Commission for Protection against Environmental Mutagens and Carcinogens. ICPEMC Working Paper No. 15/1. Genetic effects of ethanol. Mutat Res 186(3):177-200.
- Pearn JH. 1983. Teratogens and the male. Med J of Austr 2:16-20.
- Sallmen M, et al. 1998. Time to pregnancy among the wives of men exposed to organic solvents. Occup Environ Med 55:24-30.
- Sallmen M, et al. 2000 Paternal exposure to lead and infertility. Epidemiol 11(2):148-152.
- Sallmen M, et al. 1998. Time to pregnancy among the wives of men exposed to organic solvents. Occup Environ Med. 55(1):24-30.
- Savitz DA, et al. 1991. Influence of paternal age, smoking, and alcohol consumption on congenital anomalies. Teratology 44:429-440.
- Shelby MD, et al. 1986. Dominant lethal effects of acrylamide in male mice. Mutat Res 173:35-40.
- Steinberger EK, et al. 2002. Infants with single ventricle: a population-based epidemiological study. Teratology 65(3):106-115.
- Taskinen H, et al. 1989. Spontaneous abortions and congenital malformations among the wives of men occupationally exposed to organic solvents. Scand J Work Environ Health 15:345-52.
- Tielemans E, et al. 1999. Occupationally related exposures and reduced semen quality: a case-control study. Fert Steril 71:690-696.
- Trasler JM and Doerksen T. 1999. Teratogen update: Paternal exposures-reproductive risks. Teratology 60(3):161-72.
- Vine MF. 1996. Smoking and male reproduction: a review. Int J Androl 10(6):323-337.

*If you have questions about the information on this fact sheet or other exposures during pregnancy, call **OTIS** at 1-866-626-6847.*