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Fetal exposure to prescription drugs and adult sexual orientation

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Abstract

This study was undertaken to determine if prenatal exposure to therapeutic drugs contributes to variations in sexual orientation. Especially suspect were drugs that could affect the delicate balance of sex hormone levels that appear to guide the sexual differentiation of the fetal brain. The recollections of 5102 mothers concerning their use of therapeutic drugs during pregnancy were linked to reports of the sexual orientation of their offspring (as provided by either the offspring themselves or by their mothers). About 14% of the mothers recalled having taken at least one of 19 prescription drugs (or classes of drugs) during their pregnancy. Regarding male offspring, little evidence was found that prenatal exposure to any of these medications was associated with variations in sexual orientation. However, even after controlling for age, education, and self-rated recall ability of the mothers, exposure to two types of drugs was significantly related to sexual orientation among female offspring. One type consisted of amphetamine-based diet pills and the other was comprised of synthetic thyroid medications. A month-by-month analysis revealed that during the first trimester consumption of all prescription drugs was unusually high for mothers of female homosexual offspring. Prescription medications that affect the mother's and/or the female fetuses' developing immune system may alter the feminization/demasculinization of the brain in ways that cause variations in the offspring's adult sexual orientation.

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1. Introduction

According to the neuroandrogenic theory of sexual orientation, the gender toward whom one is sexually attracted is largely determined by perinatal factors rather than being a preference that individuals learn in a sociocultural context (Ellis & Ames, 1987). More specifically, the neuroandrogenic theory asserts that the level of sex hormones to which fetuses are exposed helps to sexually differentiate the brain as well as the genitals. The brain in turn is assumed to play a central role in masculinizing/feminizing behavior, inclining behavior associated with whether one prefers same or opposite sex members as sex partners.

Sexing of the genitals has been shown to occur primarily between the first and the fourth months of gestation, while sexing of the brain seems to take place from the third through the seventh months (Ellis, 1996). Due to this timing difference, sex hormones (especially testosterone) may sometimes masculinize/defeminize the genitals without having the same sexing effects on the brain. According to the neuroandrogenic theory, males whose brains failed to be fully masculinized/defeminized will exhibit varying degrees of feminine preferences and behavioral characteristics throughout life. These feminine/demasculine preferences may sometimes include males preferring same sex partners upon sexual maturation (instead of preferring opposite sex partners). Theoretically, the reverse set of circumstances could incline females to be attracted to members of their own gender following the onset of puberty.

Ellis and Ames (1987) proposed that several factors contribute to varying degrees of genital-brain sexing inconsistencies. Among the hypothesized factors were maternal consumption of drugs that influence sex hormone levels during critical periods of fetal development. If this proposal is correct, it should be possible to find differences in consumption of drugs by mothers of homosexuals relative to mothers of heterosexuals.

The present study was undertaken to identify prescription drugs consumed during pregnancy by greater proportions of mothers of homosexuals (and bisexuals) than by mothers of heterosexuals. Drugs that would be especially suspected as having the capability of altering offspring sexual orientation would be those that can affect sex hormone levels.

2. Methods

Five thousand one hundred and two (5102) women provided data regarding their use of various prescription drugs during pregnancy. Most (4839) of these women were recruited by first securing a questionnaire from their offspring, who were college students attending one of 22 universities (20 US and 2 Canadian) between 1988 and 1998 (see Ellis & Cole-Harding, 2001). Among the numerous items of information provided by the offspring were those pertaining to their sexual orientation.

In addition to the 4839 mothers recruited through the college student sample, 264 women were obtained through Parents and Friends of Lesbians and Gays (P-FLAG), an international support group for parents who have homosexual and bisexual offspring. Through special permission of the board of directors for P-FLAG, copies of a version of our mother's questionnaire were sent to 250 United States and Canadian chapters along with requests that the questionnaires be made available to any women willing to participate in our study. No matching questionnaires were

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