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What Is PXE?

Pseudoxanthoma elasticum, (PXE), is an inherited disorder that causes some tissue in the body to become mineralized, that is, calcium and other minerals are deposited in the tissue. This can result in changes in the skin, eyes, cardiovascular system and gastrointestinal system. PXE was recognized over a hundred years ago. A number of significant advances have been made in the past few decades.

What Are the Effects of PXE?

PXE results in a variety of signs and symptoms. The number, type, and severity of signs of PXE are different for each person. Certain effects of PXE can cause serious medical problems while others have less impact. The effects of PXE may include: skin changes; changes in the retina of the eye that may result in significant loss of central vision; changes in the cardiovascular system that may involve calcification of arteries and decreased blood flow in the arms and legs; changes in the gastrointestinal system that may lead to bleeding in the stomach or intestines.

The Effect of PXE on Pregnancy

We studied 795 pregnancies in 306 women affected by PXE, the largest study to date¹. The incidence of miscarriage was 12% in this group, compared to 10 to 15% in women without PXE. Three pregnant women were affected by gastric hemorrhage and three had worsening skin lesions. No ocular or thromboembolic complications were reported. Hypertension during pregnancy was reported by 12% of women, compared to 5 to 10% in women without PXE. Of the 101 women who had never been pregnant, 17% made the decision because they were advised against becoming pregnant by a health care professional and 11% did not become pregnant because they feared an adverse outcome either in their pregnancy or disease. The authors concluded that the incidence of PXE-related complications in pregnancy appears to be low, and pregnancy outcomes in PXE appear to be similar to the general population.

It appears, therefore, that based on the largest series in which obstetrical records were available, that fertility is normal, and the majority of women with PXE have a normal pregnancy, labor, delivery, and postpartum period. However, there is little argument that the potential for gastrointestinal or other hemorrhage exists, and hypertension and pre-eclampsia should be vigorously managed.

In an older and smaller study, Viljoen *et al*³ did a retrospective analysis of 54 pregnancies in 20 South African women with PXE. In their series, no episodes of gastrointestinal hemorrhage were noted. Seven out of 54 patients were found to have hypertension (13%) and the hypertension was managed by traditional means (bedrest, diuretics, antihypertensives). No ocular or other cardiovascular problems were reported, but there appeared to be a slightly higher incidence of first-trimester miscarriage (12/54, 22%). Labor and vaginal delivery were uncomplicated. In this series as in previous reports, cosmetic worsening of abdominal skin laxity and striae appeared to be proportional to parity and weight gain during pregnancy (as one would expect even in non-PXE pregnancies). Flexural skin appears to remain stable.

Effect of PXE on the Fetus

In Viljoen's series², the rate of premature delivery was in the expected range, and only 1/40 babies were born with a congenital malformation. In Bercovitch's series¹, the incidence of stillbirth was 2%, but three of the four stillbirths were the result of cord complications or abruptio placentae, unrelated to PXE. One stillbirth occurred within the month following a GI bleed, possibly from a peptic ulcer. The incidence of prematurity and low birth weight was within the range expected in the normal population. In summary, except for the consequences of severe maternal hemorrhage, which appears to be uncommon, PXE has no significant effect on the fetus. At this time, no tests exist for prenatal diagnosis, and clinical manifestations of the disease are not visible at birth.

In a study of placentas, conducted by Ivonne Pasquali Ronchetti³, with the support of PXE International, examination of 15 placentas from women with PXE and 14 control placentas, indicated that mineralization is more pronounced in placenta of women affected by PXE than in those of controls. However, the scarcity of problems during gestation in these same women, the normal weight of babies at birth and their normal growth, suggest that these changes probably do not significantly affect placental function nor fetal well-being. Thus, women who have PXE and are pregnant should tell their obstetrician to expect their placenta to be calcified and not to expect that this has any impact on the fetus.

Gynecological Aspects of PXE

In Viljoen's series², menarche occurred at the usual age, menstrual cycles were normal, and menorrhagia occurred with the expected frequency. No complications of oral contraceptive use were reported. Gynecologic and gynecologic surgical histories appeared unremarkable in their series. Viljoen raised the issue of whether other means of contraception should be considered

because of the risk of thromboembolic complications in oral contraceptive users, but no data exists to support this concern in young women with PXE.

Genetic Counseling about Inheritance for PXE

Carrier screening and genetic counseling is available for people in the preconception period for more than 100 conditions. This number will continue to rise. This genetic screening will identify for which of the screened conditions each partner is a carrier. Knowing one is a carrier will only convey risk. If both partners are carriers for a specific condition, this will tell the partners they have a 25% risk of having a child with the condition. At the present time, screening for PXE is not part of typical carrier screening panels. This is because it is so rare it is considered not worth putting on a panel, as is true of another 6,900 rare conditions. If one has whole exome or whole genome screening, one would not be screened for the majority of these rare conditions.

Thus, the decision to do carrier screening should be weighed on the basis of other more common conditions. Our **Inheritance** information sheet describes this in more detail.

Key facts:

- Pregnancy is not affected by PXE.
- The fetus, despite a calcified placenta, is not affected by the mother's PXE.
- Neither menstruation nor menopause are affected by PXE.
- Carrier screening and/or counseling before becoming pregnant if you have PXE and are concerned about the baby having PXE, is a personal decision.

¹Bercovitch L, Leroux T, Terry S, Weinstock MA. Pregnancy and obstetrical outcomes in pseudoxanthoma elasticum. *Br J Dermatol*. 2004;151(5):1011-1018. doi:10.1111/j.1365-2133.2004.06183.x

²Viljoen DL, Beatty S, Beighton P (1987): The obstetrical and gynaecological implications of pseudoxanthoma elasticum. *Brit. J. Obstet. Gynaecol*. 94:884-888.

³Gheduzzi D, Taparelli F, Quaglino D Jr, et al. The placenta in pseudoxanthoma elasticum: clinical, structural and immunochemical study. *Placenta*. 2001;22(6):580-590. doi:10.1053/plac.2001.0687