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PREGNANCY AND THE LIVER

How does pregnancy affect the liver? Are there changes in liver function?

Pregnancy has little effect on a normal liver. There are no significant changes in liver function; however, certain markers of liver function may alter slightly during normal pregnancy. For example, blood levels of the protein albumin will decrease during pregnancy because of dilution of the expectant mother's blood. In addition, the blood test for alkaline phosphatase, usually taken as an indicator of liver disease, will increase during normal pregnancy because of a production of this marker by a normal placenta. This small change does not indicate liver disease.

At what stage of fetal development does a liver start functioning? What are the stages of development for the child's liver?

The liver first appears in a developing fetus as early as the third week of pregnancy, although liver function probably does not begin until the sixth to tenth week of pregnancy. Liver function continues to develop over the remainder of pregnancy, but the liver's ability to handle such compounds as bilirubin and bile acids is still not fully mature even at the time of birth. Adult-level liver function probably develops by six to 12 months of age. During childhood, liver function is essentially that of the normal adult, except that the liver is appropriately smaller in the young child compared to an adult.

Should pregnant women be tested for hepatitis B and C?

It is now recommended that all pregnant women be tested during the last two to three months of pregnancy for the presence of the hepatitis B virus. Babies born to women carrying the hepatitis B virus are at considerable risk of contracting hepatitis B immediately after delivery. Preventive measures given to babies include vaccination against the hepatitis B virus right after birth and administration of a special gamma globulin preparation for immediate protection. These measures prevent 90-95% of transmission and provide the baby with long-term protection.

Babies born to women carrying the hepatitis C virus are very unlikely to contract hepatitis C, although transmission can occur. There is no specific preventive treatment available. Therefore, currently, there are no recommendations to test women for hepatitis C.

Can women who are infected with viral hepatitis become pregnant?

Yes, especially if their liver has not been seriously damaged.

Should babies be vaccinated for hepatitis B?

If the mother does not carry the hepatitis B virus but other family members do, then babies and young children should probably be vaccinated as early as possible. It is now recommended that all children ultimately receive vaccination against hepatitis B as well, since it is a preventable infection that may occur at any time.

Can mothers who are infected with hepatitis B or C breastfeed their babies?

Mothers who are infected with hepatitis B may breastfeed their babies, especially if the babies have received appropriate vaccination. It is not known whether the hepatitis C virus can be transmitted in breast milk. This, however, seems to be a low risk.

Can a nursing mother take interferon, the drug for hepatitis B or C, or will it harm the baby?

A nursing mother may take interferon for hepatitis B or C. It is not known, however, whether the interferon will have any effects on the nursing baby. Because interferon treatment of chronic hepatitis B or C is elective, it would probably be wise to give a mother interferon before she becomes pregnant or after she has finished nursing.

Can a woman with autoimmune hepatitis become pregnant and give birth to a healthy baby?

Yes. However, if the autoimmune hepatitis is active, women are much less fertile and are likely to have many complications during pregnancy. Thus, it is recommended that women with autoimmune hepatitis first receive appropriate treatment to obtain control of their disease before they become pregnant. They are frequently treated with prednisone, an anti-inflammatory drug that depresses the immune system, which is considered to be safe during pregnancy. Women with uncontrolled serious autoimmune hepatitis and those who have already developed cirrhosis from autoimmune hepatitis may experience complications of liver disease during pregnancy, and their babies are at a higher risk of premature delivery and fetal death. Those babies who are born, however, are normal.

Women with autoimmune hepatitis who require continued use of prednisone to maintain remissions may well be able to become pregnant and carry a fetus to term. However, they

should continue use of prednisone during pregnancy as the disease may flare up.

Why do some pregnant women experience itching and jaundice?

During pregnancy some women experience the onset of itching (pruritis) and jaundice, usually related to an impaired bile flow. It arises because of the changes in the liver's ability to handle chemicals called bile acids and bilirubin, and to make bile, probably from the effects of large doses of the hormone estrogen (which normally increases during pregnancy). Certain women have an inherited susceptibility to these effects of estrogen. Women who have had impaired bile flow in pregnancy may develop a similar disorder if they take oral contraceptives. For the mother the disorder is mild, although the itching can be very bothersome. In some severe cases the fetus may become distressed and there is a risk of premature delivery and a low but increased risk of early fetal death or stillbirths. In general, the disease is moderate to mild, and neither the mother nor the baby suffers any lasting consequences.

What is Wilson's disease and how does it affect pregnant women?

Wilson's disease is an inherited defect that results in the body storing too much copper, which then becomes toxic to the liver, brain, and other organs. Women with untreated Wilson's disease have difficulty becoming pregnant, and experience more miscarriages and spontaneous abortions. In addition, in untreated and symptomatic Wilson's disease both the mother and fetus are considered at high risk during pregnancy. Women with Wilson's disease that has been well controlled, and in whom body copper levels have been reduced to near normal, regain fertility and may have normal, uneventful pregnancies and healthy babies.

Are there any other liver diseases that can affect pregnant women and their babies?

In addition to the diseases mentioned, women with less common diseases, such as primary biliary cirrhosis, primary sclerosing cholangitis, and alcoholic liver disease, among others, may consider pregnancy. In general, women in which liver disease has produced severe liver damage, particularly cirrhosis or serious liver dysfunction) are less fertile. These women and their babies are at higher risk of complications during pregnancy. In addition, three rare liver disorders may have serious consequences for pregnant women and their babies. They are intrahepatic cholestasis of pregnancy (impaired bile flow), toxemia-related disease with the HELLP syndrome, and acute fatty liver of pregnancy.

What is toxemia (pre-eclampsia) and how does it affect the liver?

Toxemia (or pre-eclampsia) is a fairly common disorder that occurs late in pregnancy and

includes high blood pressure, kidney dysfunction, and the development of leg swelling or edema. In approximately 10% of women with pre-eclampsia, the liver is also affected, with development of blood clots and bleeding into the liver. In mild cases, liver function remains normal, although liver blood tests may be abnormal. In severe cases, large parts of the liver may be destroyed, leading to symptoms similar to severe viral hepatitis. In extremely severe cases, there may be major bleeding into parts of the liver or abdomen, a life-threatening situation.

What is the HELLP syndrome?

The HELLP syndrome is part of the liver disease that affects women with pre-eclampsia. It derives its name from the abbreviations for **h**emolysis (breakdown of red blood cells), **e**levated liver tests, and **l**ow **p**latelets in the blood. This occurs in approximately 10% of all women with pre-eclampsia, and may be mild (diagnosed through abnormal blood tests) or may develop into severe liver damage. The disease stops immediately after delivery, and the liver generally heals itself within days to weeks. While the disease is ongoing, the mother is at risk of complications of liver damage and bleeding, and the baby is at risk of premature delivery or stillbirth.

Do oral contraceptives have an adverse effect on the liver?

Oral contraceptives have little adverse effect on the liver in most women. They may, however, cause increased growth of an uncommon liver tumor called a liver cell adenoma. Adenomas are benign liver tumors and do not spread outside the liver. Very large adenomas, however, may rupture and bleed. Thus, oral contraceptives probably should not be used by women who have significant adenomas. Oral contraceptives also may cause itching, jaundice, and cholestasis (decreased bile flow) in women with a genetic susceptibility to the effects of estrogens. Although estrogens are normal female sex hormones, at high levels they may interfere with bile formation in some women. If a woman taking an oral contraceptive develops this estrogen-induced cholestasis, the contraceptives should be discontinued. No lasting effect on the liver is anticipated.

Can a woman who has had a liver transplant become pregnant?

Women who have had a successful liver transplant with good liver function can become pregnant. Fertility returns within a few months after the transplant, and such women have successfully carried normal pregnancies to term. Only a few women who have had a transplant have gone on to become pregnant, however, so it is not known whether the ability to become pregnant and to carry a normal baby to term is completely normal. In addition, although the drugs used for immunosuppression after liver transplantation are thought to be relatively safe for the developing baby, absolute safety cannot be guaranteed.

Can someone with cirrhosis become pregnant?

Yes, although it is much more difficult because of the markedly decreased fertility. If they do become pregnant, they may be able to give birth to a healthy baby. The mother, however, may experience complications of liver failure during pregnancy, and the baby is at higher risk of premature delivery, spontaneous abortion, miscarriage, and stillbirth. Those children who are born, however, are generally healthy.

Is it safe for a pregnant woman to drink moderate amounts of alcohol?

No, because it can damage the unborn child. Moderate alcohol consumption (one to two drinks) probably does not affect the liver of an otherwise normal pregnant woman, but *even moderate doses may cause damage to the fetus*. In addition, for any woman with liver disease, it makes sense to avoid taking in substances such as alcohol that are known to cause liver toxicity in many people.