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Information about HIV, Hepatitis B and Hepatitis C in assisted reproduction

Dear Couple,

Chronic infectious diseases, such as HIV, hepatitis B and hepatitis C, are well known to be harmful to your health. However, during reproduction they can be transmitted both to your partner or to your offspring and jeopardize their health. Consequently, during the diagnostic work-up of both male and female infertility, various tests have to be performed to verify the presence or absence of various infectious diseases, most notably HIV, hepatitis B and hepatitis C.

This short leaflet has been written to inform you about current medical knowledge concerning these infectious disease and reproductive health together with our policy with regard to the use of assisted reproductive technology. The presence of one or more of these chronic infections considerably adds to the complexity of these treatments. Therefore, it is of utmost importance to understand some of our guidelines not only to achieve a successful pregnancy but also to prevent complications,

We have subdivided this information leaflet in three chapters:

1. HIV
2. Hepatitis B
3. Hepatitis C

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1. Information about the role of HIV in infertility

Any person can carry an HIV-infection over prolonged periods of time without showing any symptoms. In that situation the infection can be transmitted to another person through sexual intercourse or during gestation, delivery or breastfeeding to the offspring. In addition to that, an individual carrying the virus can contaminate both the members of the treating staff and the laboratory for assisted reproduction, thereby potentially also causing a threat to other infertile couples under treatment. Therefore, in order to prevent any contamination, all patients are requested to undergo an HIV-test during their diagnostic work-up. Of course, it is also possible to have this test carried out in another laboratory or to copy the results of a recent test into our files.

It is, however, permitted to refuse all HIV-testing. In that particular situation, diagnostic evaluation of your infertility can still be performed, but in order to protect the other couples and to avoid potential contamination of our laboratory, all examinations will be performed in a separate laboratory setting, fully equipped with all facilities to rule out viral infections. The additional financial costs caused by this special care will be calculated at your expense.

In case of the rare event of detecting a new infection with HIV during the infertility diagnostic work-up, you will be referred to a specialized institution. A vaccination against HIV is at present not available. Nowadays, a chronic infection with HIV can be stabilized and controlled, but not cured, with various antiretroviral medications, which then have to be taken over prolonged time periods. This has opened the perspective of family planning in HIV-infected individuals. Modern assisted reproductive technology offers the possibility of pregnancy in cases, in which the condition of the infection is well under control.

The spermatozoa of HIV-infected men can be separated from the surrounding seminal fluid, which mainly harbours the viruses. For this purpose, the semen sample must be prepared through multiple washing steps until no virus can be detected any more. After confirmation of the virus-free status of the washed sample, these washed spermatozoa can be used either for insemination into the uterine cavity of the recipient, or for in vitro fertilization (IVF) or intracytoplasmic sperm injection (ICSI). At present, several thousand couples have been treated worldwide in such a way and no case of crosscontamination was described so far.

In HIV-infected infertile women potentially all methods of assisted reproduction can be used in order to prevent an infection of the partner. However, in this particular situation we also have to consider to risk of transmitting the virus to the offspring, either during pregnancy or during delivery and thereafter (during breastfeeding). Various efficient protective measures have to be taken, such as lowering the concentration of the virus in the blood circulation of the mother using specialized medications, delivery by caesarian section and complete avoidance of breast feeding. Women with an HIV-infection planning a pregnancy together with their partner are entitled to be fully informed about all these protective measures. Other diagnostic procedures, such as prenatal diagnosis based on amniocentesis, can not be performed because of the danger of infecting the foetus during the sampling of the amniotic fluid. Although at present the intake of antiretroviral medication both during early pregnancy and thereafter does not seem to cause any malformations, the likelihood of pregnancy with assisted reproduction in HIV-infected mothers is significantly reduced whereas the incidence of complications during pregnancy (such as miscarriage and premature delivery) seems to be higher.

Swiss legislation regulating assisted reproduction warrants all measures to be taken to ensure optimal wellbeing of the infant and stipulates that before treatment both the compliance and responsibility of both partners are evaluated by the medical team. In order to ensure full cooperation of the couples, a round table meeting with all experts will be organized, during which

all parties are informed about the medical and social situation of the couple. In the presence of these experts, the couples will be informed about all aspects of achieving pregnancy in the presence of HIV in one of both partners and the expert panel will take the responsibility to offer medical care during the treatment of their infertility.

2. Information about the role of hepatitis B in infertility

Evaluation of the presence or absence of a chronic infection with the virus causing hepatitis B is part of routine pregnancy care in Switzerland. Consequently, this examination should also be performed during diagnostic evaluation of infertility. Those cases, in which a new infection with hepatitis B is detected, will be referred to a specialized organization for further evaluation. Chronic infections with the virus causing hepatitis B constitute a serious health hazard, potentially leading to liver cirrhosis and liver cancer (1 % of all cases). In severe cases medical treatment has now become available, as with interferon-treatment approximately 80 % of all cases with hepatitis B can now be cured. However, such a treatment is time-consuming (expected duration of the treatment: 1 year) and is accompanied by many side effects. Therefore, such a treatment should only be pursued in selected cases.

An infertility treatment can be performed despite the presence of the hepatitis B infection in one of both partners. In most cases, the course of the pregnancy is not affected by this virus. The healthy partner and the newborn baby can be vaccinated in order to prevent transmission of the virus. However, the presence of the virus carries the risk of contaminating both the personal and the laboratory of the treatment unit, particularly in those cases, in which high concentrations of the hepatitis B virus are found in the blood or in the seminal fluid.

As in HIV, the hepatitis B virus can be washed away from the spermatozoa through the usual semen preparation. However, this has to be performed in a separate laboratory, which is

continuously decontaminated in order to prevent crosscontamination of samples of other patients. The absence of the viruses in the washed specimens has to be verified through repeated testing. However, despite meticulous care it can not be excluded that the hepatitis B virus has become integrated into the genetic material of isolated spermatozoa, thereby potentially being transmitted to the offspring. Probably, this transmission pathway is extremely rare und unlikely to happen.

In contrast to HIV-infected mothers, the presence of the hepatitis B virus during pregnancy must not necessarily lead to delivery with caesarean section. However, the newborn child must immediately be vaccinated against the virus. In individuals carrying both the HIV and the hepatitis B virus life expectancy may be reduced.

3. Information about the role of hepatitis C in infertility

A chronic infection with hepatitis C is less hazardous to the liver function and to the general health than an infection with hepatitis B. The course of the pregnancy is not affected by the virus associated with hepatitis C. However, depending on the concentration of the virus in the blood of the mother, in approximately 3 to 5 % of all cases the virus is transmitted to the newborn during pregnancy or during delivery. However, although a vaccination of the newborn, as in hepatitis B, is not possible, delivery through caesarean section is not considered to be necessary.

In those individuals, in whom hepatitis C causes liver damage, as indicated by elevated liver enzyme levels in the blood, a treatment with interferon can cure approximately 50 % of all cases. Therefore, all newly detected cases during infertility work-up will be referred to a specialized department for further diagnostics and treatment.

As in hepatitis B, the viruses causing hepatitis C can be eliminated effectively from the spermatozoa through thorough washing of the semen sample. However, this may cause a

contamination of the laboratory, which may endanger both the members of our team and other patients. Therefore, all cases with hepatitis C will be treated in a separate laboratory, which is regularly decontaminated.

4. Summary

These infections are not the only ones that can cause complications during pregnancy and delivery. During infertility work-up we also screen various other infectious diseases that are potentially hazardous to the pregnant women or their offspring:

1. Rubeola
2. Syphilis
3. *Chlamydia trachomatis*
4. *Ureaplasma urealyticum* and *Mykoplasma hominis*

Each of these infections can be treated with antibiotics or prevented with vaccination. Another potential hazardous infection, toxoplasmosis, can not be vaccinated against and is therefore only screened for during pregnancy. Those rare cases of newly acquired toxoplasmosis during pregnancy, can be treated with antibiotics. Other infections, such as parvovirus or cytomegaly, are not systematically searched for, because at present no prophylactic or therapeutic option is available.

The team of the Fertility Unit at the University Women's Hospital Basel hopes, that these leaflet provides you with the information needed concerning potentially hazardous infections during pregnancy. We also hope that you fully collaborate in our endeavour in preventing unwanted contaminations.

Prof. Christian De Geyter

The Team