Executive summary

Health Council of the Netherlands. Risks of alcohol consumption related to conception, pregnancy and breastfeeding. The Hague: Health Council of the Netherlands, 2005; publication no. 2004/22.

Around 80% of women of child-bearing age in the Netherlands drink alcoholic beverages. Many women stop consuming alcohol as soon as they become pregnant, or even earlier if they wish to become pregnant. Nevertheless, it is estimated that 35–50% of the pregnant women in the Netherlands continue to consume alcohol. The percentage of non-pregnant Dutch women who drink 'heavily' ranges from 3% to 12%, depending on the age group concerned. Heavy drinkers consume an average of six or more standard drinks* of an alcoholic beverage per day. Heavy drinkers are less inclined to stop drinking alcohol after discovering that they are pregnant than women whose alcohol consumption is lower.

This advisory report concerns the consequences of moderate alcohol use for the fertility and for the growth and development of the (unborn) child. The central questions addressed are as follows:

1 What effects does moderate alcohol use prior to conception have on fertility and pregnancy?
2 What effects does moderate alcohol use during pregnancy have on pregnancy and the unborn child?
3 What effects does moderate alcohol use during breastfeeding have on the baby?
4 How effective is health education aimed at reducing alcohol use?

* In the Netherlands, a "standard drink" contains approximately 10 grams of ethanol (irrespective of the type of beverage). Examples of Dutch standard drinks can be found in Annex D.

5 What advice on alcohol use should be given to women who wish to become pregnant, women who are already pregnant, and women who are breastfeeding?

'Moderate alcohol use' – the phrase used in formulating the first three questions – is, however, open to a variety of interpretations. Not surprisingly, therefore, there is also considerable variation in the quantities of alcoholic beverages that different bodies designate as 'moderate'. The authors have consequently sought to avoid using this phrase in the advisory report, preferring (wherever possible) to specify the amount of ethanol (pure alcohol) referred to in each case.

Ethanol passes from the mother via the placenta to the embryo and foetus. After delivery, ethanol can pass via the breast milk to the baby. The concentration of ethanol in embryonic and foetal tissue during pregnancy is the same as that in maternal blood. In nursing women, the concentration in breast milk is the same as that in the blood. However, this results in the infant having a considerably lower concentration of ethanol in the blood, since the amount of ethanol that is consumed via the breast milk will be distributed throughout the infant's body.

The level of ethanol in maternal blood is determined not only by the amount of alcohol that the woman consumes but also by the time-span involved, her body size, the presence of food in the stomach, and the speed with which ethanol is broken down in the body. This breakdown process is partly dependent upon genetic factors, which influence not only the rate of breakdown but also the effects that ethanol produces in the body. Due to all these factors, sensitivity to alcohol can vary from one woman to another.

In evaluating the scientific literature, the Committee has given careful consideration to the methodological problems that are encountered during the research that underpins this advisory report. Some effects have not been mentioned in this summary (notably those that have been insufficiently researched to allow conclusions to be drawn).

Effects of alcohol use prior to conception

There is evidence to suggest that consumption of just one standard drink of an alcoholic beverage per day or possibly even less prior to conception may reduce fertility in women. The risk of miscarriage and foetal death is possibly increased not only by female alcohol consumption prior to conception, but also by male alcohol consumption in this period. The degree of both effects appears to increase to the degree that alcohol use increases.

The Committee's conclusion is that it is not possible to determine a male and female lower limit for alcohol consumption prior to conception from which it could definitely be said that there was no effect upon on fertility and pregnancy.

Effects of alcohol use during pregnancy

Alcohol use during pregnancy can have various consequences for embryo, foetus and pregnancy. The risks and the severity of the effects are directly proportional to the average alcohol consumption of the individual concerned and the number of glasses consumed on each occasion. The nature of these effects is partly dependent on the moment of exposure, but alcohol use appears to produce undesirable effects throughout pregnancy.

It is possible that average consumption of less than one standard drink per day during pregnancy may increase the risk of intra-uterine death and premature birth, influence the spontaneous movements and reactions of the foetus, and have an adverse effect after birth on the child's psychomotor development. Furthermore, on the basis of available *in vitro*-studies, animal experiments and studies in non-pregnant women the possibility cannot be ruled out that exposure to even very low amounts of ethanol may increase the risk of cancer. There is, however, no concrete evidence to suggest that children who have been exposed to ethanol in the womb have an increased risk of cancer.

Consumption of between one and two standard drinks leads to an immediate, temporary interruption of foetal breathing movements in every pregnant woman. These foetal breathing movements cause amniotic fluid to enter and leave the lungs, which is important for the development of the lungs. The oxygen for the foetus is, of course, supplied via the placenta.

Among pregnant women who drink an average of one to two standard drinks per day, it is likely that there will be an adverse effect on the child's psychomotor development and it is possible that the risk of intra-uterine death, premature birth and low birth weight may be increased.

The evidence for the effects mentioned above is stronger where average consumption is between two and six standard drinks per day. Furthermore, with this exposure level the child may possibly have an increased risk of developing alcohol-related problems later in life.

Where average daily consumption exceeds six standard drinks, there is, in addition to the effects that have been mentioned, also an increased risk that major malformations and the specific facial characteristics of foetal alcohol syndrome (FAS) may occur in the child.

The risk of certain malformations may possibly also be greater in the case of women who have a low average alcohol consumption during pregnancy but drink six or more glasses on some occasions (binge drinking).

The preceding paragraphs concern the type of effects that may occur at the specified levels of alcohol use. There are clear indications that the risks are raised substantially at low levels of alcohol consumption. The effects are difficult to quantify since the results of the available studies differ somewhat on this point. It is clear, however, that the severity of the effects increase with the individual's average alcohol consumption and the number of glasses consumed on each occasion.

The Committee concludes that every reduction in alcohol consumption leads to a reduction in risks. It is not possible to determine a lower limit for alcohol consumption from which it can be stated with certainty that there would be no effect on the foetus and the pregnancy.

Effects of alcohol use during breastfeeding

Alcohol use during breastfeeding also has adverse effects on the child. Babies have been found to drink less milk and to have a disturbed sleep-wake pattern for three hours after nursing mothers have consumed between one and two standard drinks. The effects of lower consumption levels have not been studied.

The conclusion is that it is not possible to indicate a safe lower limit for alcohol consumption during breastfeeding.

Health education

Scientific studies show that various problems may occur in health education about alcohol use during pregnancy. In some women, strict recommendations to refrain altogether from alcohol consumption will result in stress, feelings of guilt or a feeling that they would fail anyway. This could result in these women not reducing, or even increasing, their alcohol consumption. A more balanced message will probably achieve a better result with them. Health education on the risks of alcohol use during pregnancy usually has no effect with heavy drinkers. They need special guidance and care to reduce their consumption, and even then they rarely succeed in completely stopping their alcohol intake.

In one-to-one health education, enquiries about the level of alcohol consumption can be made and health education can be linked to the woman's possibilities. This is proba-

bly the most effective method of health education. Women receive information in many other ways, such as through the Internet, mass media and brochures. The health education notice on bottled drinks in the United States proved to be ineffective. To have an impact, a health education notice has to be simple, not create unnecessary anxiety, make clear what kind of behaviour is harmful to the child and what is not, and indicate how the behaviour can be changed.

Recommendations

The Committee recommends that health education provides that advice with which the harmful effects of alcohol consumption are excluded with certainty. Women can achieve this if they refrain from consuming any alcoholic beverages from the moment they attempt to become pregnant until the moment they stop breastfeeding the baby. Men can achieve this if they refrain from consuming alcoholic beverages from the moment the woman attempts to become pregnant until the moment pregnancy has been confirmed.

It might be helpful to provide the following additional information along with the health education containing this strict advice. With regard to pregnancy, any reduction in alcohol consumption at any time during pregnancy reduces the risks and, moreover, the volume of alcoholic beverage consumed per occasion should be as low as possible. Alcohol consumption may play a role after childbirth in an inability to properly stimulate or continue lactation. Mothers who have indeed consumed a standard measure of an alcoholic beverage can avoid exposing the nursing child to ethanol by refraining from breastfeeding the infant or expressing milk for later feeding for a period of three hours immediately following the alcohol's consumption. In the case of the consumption of a high volume of alcohol, the period should be longer and can be calculated by multiplying the three-hour period by the number of standard measures of alcohol consumed.

Health education on alcohol consumption should not only focus on pregnant and lactating women, but also and especially on women who are attempting to become pregnant, and on their partners. These individuals should preferably be given individual health education with which enquiries are made about their consumption of alcohol. There are still no guidelines on how to enquire about the level of alcohol consumption. The Committee recommends that guidelines on this should be drafted. Enquiries should not only be made prior to conception, but also at various times during pregnancy. It is important to ascertain at the earliest possible stage whether or not a woman consumes alcohol, for heavy drinkers require specialised treatment and care. The required guidelines could also describe the referral procedure for heavy drinkers.

Besides individual health education, other types of health education will also continue to be of major importance. It is essential to ensure that the message with this is con-

sistent. There are now differences between the recommendations provided by the various health education authorities on alcohol consumption during pregnancy and breastfeeding. It is important to ensure that they all provide the same message in the future.