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Medication and fertility

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Abstract

Medication in general has a vital role in health and wellbeing. There are several good and lifesaving reasons to use adequate medication during adolescence and fertile years.

In this article medication is divided into three different categories; prescribed medication, non-prescribed medication (also called over-the-counter medication) and herbal medication.

It is important to ensure wise and safe medication use for both mother and child. This can be done by efficient and evidence-based pre-pregnancy and pregnancy counselling.

Key words: medication, herbal medication, fertility

Tiivistelmä

Lääkitys ja lääkkeet ovat tärkeitä terveyden ja hyvinvoinnin kannalta. Lääkkeiden käyttöön on useita hyviä ja henkeä pelastavia syitä myös murrosiässä ja hedelmällisessä iässä.

Tässä artikkelissa lääkitys on käsitelty kolmessa eri kategoriassa; reseptilääkkeet, käsikauppalääkkeet ja luontaistuotteet.

Raskautta edeltävä ja raskauden aikainen lääkkeiden käytön neuvonta on tärkeää, jotta voidaan varmistaa turvallinen lääkityksen käyttö sekä äidin että lapsen näkökulmasta.

Avainsanat: lääkitys, luontaistuotteet, hedelmällisyys

Introduction

Medication in general has a vital role in health and wellbeing. There are several good and lifesaving reasons to use adequate medication during adolescence and fertile years.

In this article medication is divided in three different categories; prescribed medication, non-prescribed medication (also called over-the-counter medication) and herbal medication.

According to the European health interview survey between 2013 and 2015, women are more likely to use some medication (Eurostat 2014). In United States the prevalence of using medication during pregnancy, has increased by 68% during the last 30 years (Thorpe et al. 2013). That is why professionals in healthcare must be aware of the advantages and disadvantages of all kind of medication; prescribed, non-prescribed and herbal medication.

The long-term effects of using medication in the pre-pregnancy period and during pregnancy are not yet fully known. Therefore, the information given does not always help to make informed decisions (Thorpe et al. 2013).

Prescribed medication

Without doubt, prescribed medicines have a purpose and place to life in general. Prescribed medicine is vital, and it may even be lifesaving. Prescribed medicine makes living possible and easier, healthier and reduces many illnesses and reduces risks. It is important that women, especially fertile women, have a good plan on how to protect their fertility even if they have a medical condition that requires regular medication.

It's not just the patients' own fertility that should be considered. Professionals must consider the fertility of the child the patient

is planning to have in the future or the one she is carrying, the unborn child. (Leverrier-Penna et al. 2018.) Epigenetics has a vast influence on fertility and pregnancy outcomes of our future generations (Pisarska et al. 2019).

In EU member countries, approximately half of the population have used some prescribed medication during a survey period in 2013-2015. In all age groups, in all member states women were more likely than men to use prescribed medicines. That difference was partly explained with the use of birth control pills and hormonal medication for menopause. (Eurostat 2014.)

In nearly all EU countries the use of prescribed medicines among women was lowest in the age group of 15–24, and then it increased with age, peaked in the oldest age group 75 years and over (Eurostat 2014).

According to research by Trønnes et al. (2017) most European women used medication that was safe to them or their fetus during pregnancy. However, if the pregnant women had some chronic illness or condition, she was more likely to use medication that was risky for the pregnancy. Other factors that increased the risk of using risky medication during pregnancy were socio-demographic reasons, such as being a student, having a lower education level, having previous children, not using folic acid, alcohol consumption and smoking. (Trønnes et al. 2017.)

A study made in the Netherlands (1999–2007) revealed that 77% of pregnant women received prescribed medication 12 months before they were pregnant and 67% during pregnancy. Potentially risky medication for the developing embryo or fetus were taken by 16% of the pregnant women in the 12 months before conception and 5% of all women took these medications during pregnancy. (Zomerdijsk et al. 2015.)

For the sake of the health of the mother or the unborn child it is not always possible to avoid potentially risky medication. Even

so, healthcare professionals must have the knowledge and time for thorough counselling and guidance before the patient is even pregnant to adjust the medication or the dosage, if possible. (Trønnes et al. 2017.)

Non-prescribed medication

In this article, non-prescribed medication or over-the-counter medication refers to painkillers such as paracetamol, ibuprofen, and salicylic acid.

According to studies paracetamol, ibuprofen and salicylic acid may have endocrine disruptive properties capable of altering human reproductive function from fetal life to adulthood in both genders (Holm et al. 2016; Trønnes et al. 2017; Banihani 2019).

Paracetamol may disturb fetal hormone signaling. Disturbed fetal hormone signaling can cause the female fetus to have a diminished follicle reserve. The reservoir of primordial follicles is decreased due to intrauterine exposure to paracetamol. Maternal exposure to paracetamol may cause male fetus an undescended testicle and therefor reduced fertility for both sexes. (Holm et al. 2016.)

Ibuprofen is one of the most widely used non-prescribed pain killer worldwide. It is very well known that using ibuprofen in the third trimester of pregnancy closes the fetus' ductus arteriosus prematurely. (Leverrier-Penna et al. 2018.)

But according to recent studies anti-inflammatory drugs (indomethacin, diclofenac, naproxen, ibuprofen and ketoprofen, coxibs) which act as inhibitors of prostaglandins may cause ovulation disorders and even inhibit ovulation. Prostaglandins are needed in normal ovulation. Ultrasound has shown that in ovulation the follicle does not rupture, and the egg isn't released

among women who have received a prostaglandin inhibitor. (Leverrier-Penna et al. 2018.)

Hormonal signaling of prostaglandin is also needed in normal fetal ovarian development. Organogenesis is happening in early pregnancy, so the use of ibuprofen or other anti-inflammatory medication in early pregnancy may harm the fertility of the unborn girl. (Leverrier-Penna et al. 2018.)

A study made among healthy young men who used ibuprofen regularly (up to six weeks) showed that ibuprofen disrupted the production of male sex hormones. The use of ibuprofen led to anti-androgenic effects and to compensated hypogonadism, a condition normally seen in older men and smokers. (Kristensen et al. 2018.)

High doses of ibuprofen affect the hormonal balance, affects the endocrine action of Leydig cells (Leydig cells produce testosterone) and inhibits steroidogenesis. Using ibuprofen for months alters the endocrine system and causes infertility and other health problems such as muscle wastage, erectile dysfunction, and fatigue. (Kristensen et al. 2018.)

Several scientific researchers have discovered that salicylic acid or aspirin affects the production of testosterone and therefore, has a negative effect on semen. The testosterone induces the spermatogenesis in the testes. Minor exposure to aspirin decreased the production of testosterone and bigger exposure had anti-androgenic effects. (Banihani 2019.)

As Banihani (2019) concluded, aspirin seems to affect semen many ways. Aspirin may decrease the amount of testosterone and formation of testicular prostaglandins. Aspirin may prevent

or reduce nitric oxide synthases and for the sperm to be able to fertilize an egg, the nitric oxide synthase is necessary. Aspirin may also cause increased oxidative injury to sperm. Aspirin seems to harm many semen quality parameters; motility, viability, volume and count and the DNA. (Banihani 2019.)

Herbal medication

Herbal medication is often referred as natural medication and thought to be safer alternative, lacking the side-effects of conventional medication. Herbal medication may work, heal, and influence in many valuable and beneficial ways, but the safety and true efficacy must be taken into consideration. (Colalto 2020.)

In the past decade, the use of herbal medication has been increasing in western countries to replace or complement conventional medication. In Britain it is reported that nearly 60 % of women used at least one herbal medication during pregnancy. Commonly used were ginger, cranberry, raspberry leaf, chamomile, peppermint and echinacea. Ginger was used to avoid nausea and to promote healing of a wound, but recent studies have shown that ginger might be harmful to organogenesis and development of the fetus. Cranberry may prevent urinary tract infection, but it also may cause gastrointestinal upsets. (Izzo et al. 2016.)

Many substances in herbal medication, natural products and medicinal plants cross the placental barrier and are transmitted to the developing fetus. According to several studies there is only a couple of individual case reports in which an herbal plant or substance was teratogenic in humans. Causal link is in most cases not shown. More high-quality research in herbal medication is needed to firmly establish the efficacy and safety. Also, the development and access to the market should be regulated

worldwide in the same way as in Europe where European Medicines Association (EMA) is regulating medicine. (Malm et al. 2008.)

Most commonly the disadvantages of herbal medication occur when the product is intentionally added or during the manufacture the product has accidentally been exposed to synthetic medicinal substances, toxic medicinal plants, or heavy metals (Malm et al. 2008). Sometimes it can be that the wrong part of the plant is used, it should have been for example the root of the plant, but leaves were used to manufacture the product. Toxic amounts of metals and metalloids, such as lead, arsenic and mercury, have been found in herbal medication. (Gyamfi 2019.) Purchasing herbal medication online may not be safe or even healthy. It might be cheaper, but consequences to health may be dangerous (Malm et al. 2008).

To the conclude

All kind of medication must be taken seriously, specially from the point of view of fertility. Pre-pregnancy and pregnancy counselling, how to wisely use medication is important. With proper measures it is possible to ensure safe and purposeful medication use for both mother and child. Healthcare professionals are responsible of giving timely and adequate guidance and counselling to clients and patients. To be able to offer adequate guidance and counselling, healthcare professionals must update their knowledge widely and regularly from trustworthy sources.

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