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To cite this Article / Käytä viittauksessa alkuperäistä lähdettä:

Mettälä, M. (2021) Oral health and fertility. Teoksessa Tuomi, J. (toim.) Preconception health and care - Handbook for education. Tampereen ammattikorkeakoulun julkaisuja, sarja B, raportteja 135, s. 238-245.

URL: <http://urn.fi/URN:ISBN:978-952-7266-60-1>

# Oral health and fertility

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## Abstract

Many things affect human fertility. The effects of oral health on male and female fertility and on pregnancy and the future health of the child are significant but often ignored. Good oral hygiene can prevent small and innocent problems. Ignoring oral hygiene may lead into chronic inflammation in the mouth and systemic infectious status throughout the body. Smoking and snorting are known to weaken oral hygiene. Fertility is protected by good oral health.

Keywords: oral health, fertility, pregnancy

## Tiivistelmä

Hedelmällisyyteen vaikuttavia asioita on useita. Suunterveyden vaikutus miehen ja naisen hedelmällisyyteen sekä raskauteen ja syntyneen lapsen tulevaan terveyteen on merkityksellinen, silti usein asia, joka sivuutetaan. Hyvällä suuhygienialla voidaan ehkäistä pieneltä ja viattomalta tuntuvat ongelmat, jotka hoitamattomana aiheuttavat kroonisen tulehduksen suussa ja systeemisen infektiotilan koko kehossa. Tupakointi ja nuuskaaminen ovat tunnetusti suun hygieniaa heikentäviä tekijöitä. Hedelmällisyyttä suojellaan myös hyvällä suunterveydellä.

Avainsanat: suunterveys, hedelmällisyys, raskaus

## Introduction

This article will briefly review the effects of oral health on fertility and pregnancy. Dental care is important throughout life, but it is

especially important when planning for pregnancy and during pregnancy. Studies are proving that oral health has an effect on fertility and pregnancy in both men and women (Vamos et al. 2015). Good oral hygiene and regular brushing of teeth have also been associated with the experienced self-confidence by the young person, the survival in everyday life and the risk of exclusion (Scheerman et al. 2016). The use of tobacco products has a significant impact on oral health and oral hygiene.

## Oral health

Oral self-care refers to regular cleaning of teeth and mouth, the use of fluoride toothpaste and smart eating habits that supports oral health. It is also important to avoid snacking and sugary drinks in maintaining oral health. The conditions for maintaining good oral health are oral care and regular use of oral health care services. (Koponen et al. 2018.)

According to the Finnish institute for health and welfare study report (2018), in 2017 53% of Finnish men and 83% of Finnish women brushed their teeth at least twice a day. Young men were reported to brush their teeth twice a day, which is more often than older men. In women the differences between age groups were small. (Koponen et al. 2018).

A healthy mouth is a mouth with no inflammation of the gums (gingivitis), cavities in the teeth or inflammation of the tissues that surround and support teeth (periodontitis). Gingivitis, tooth plaque and caries or periodontitis cause excess bacterial infection in the mouth. It strains mouth and body. Any excess burden and strain should be taken care of when planning to become pregnant.

## Effect of tobacco products on oral health

Smoking causes several diseases and premature deaths. Tobacco products are harmful to health in general, but they are also very harmful to oral health. Tobacco products cause tooth discoloration, inflammation of the gums, reduced tooth fixation and oral cancer. Smoking and snorting weakens the oral immune system, causes oxygen deficiency in the tissues of the oral area, and reduce blood circulation and healing of mouth wounds. (Heikkinen 2011.)

Tobacco products contain several different chemicals, some of them are carcinogens. Thousands of different chemical compounds have been identified in tobacco, of which more than 100 compounds are harmful to humans and more than 60 of them cause cancer. Carcinogens and harmful chemical compounds of tobacco products originate from the tobacco plant itself, some of the pesticides and some come from substances used for preservation and manufacturing. All tobacco products (cigarettes, cigars and cigarillos, fine-cut tobacco for handrolled cigarettes, pipe tobacco and moist snuff / snus) contain cancer-causing agents. (Leon et al. 2015.)

Smokers are at greater risk of developing dental and gum disease compared to non-smokers. The adverse reactions are seen both clinically, but also when measuring inflammatory inhibitors of blood in people using tobacco products. Inflammatory levels in smokers have increased levels. Oral bacteria moves forward through the blood circulation, and is a risk and burden for the whole body. Smoking multiplies the risk of oral inflammation and makes it often more difficult to treat. The more and longer a person has smoked, the more serious the periodontitis usually is. (Heikkinen 2011.)

## Effect of oral health on fertility

Inflammation of the mouth affects the body in three different ways

- bacteria in the mouth passes through the blood stream throughout the body and causes new inflammation in another target organ
- toxins produced by bacteria in the mouth cause new inflammation or tissue damage
- immunity decreases and it facilitates access of another inflammation in the body. (Heikkinen 2011.)

Smoking and smoking related infections of the oral area cause oxidative stress in the body. In a normal, healthy state, the body's cellular metabolism produces free radicals; reactive oxygen compounds. They are produced only to the extent that the cell's own natural antioxidant systems are able to eliminate the resulting disadvantages. In inflammation, the balance swings to the wrong direction. Reactive oxygen compounds are produced more, and it leads to oxidative stress. High oxidative stress is straining the body increasingly. Oxidative stress leads often to structural and functional disorders of cells, which in turn can cause cell death through different mechanisms. (Tremellen 2008.)

Oxidative stress disrupts male fertility in two different ways. It damages the sperm membrane and reduces sperm motility and the ability to fertilize the egg. Secondly, it damages the DNA of sperm. Damaged sperm DNA effects sperms genomes on the embryo and may harm normal development of the embryo. (Tremellen 2008.)

Oral health also affects sperm. The amount of healthy sperm is at risk if mouth is untreated; the amount of poor sperm elevates. Poor oral health is associated with reduced sperm

quality. (Nwhator 2014; Rashidi Mayfodi & Iranaq 2017.)

Treating the problems of the oral area (teeth and gums), it is possible to improve the amount, mobility and structure of sperm in men with periodontitis. (Rashidi Mayfodi & Iranaq 2017.)

Inflammation, acute or chronic, adversely affects spermatogenesis and decreases sperm quality (Pergialiotis 2018). Poor oral health affects the number of bacteria found in a man's body and his semen. Abnormal sperm count is one of the main reasons for decreased male fertility. (Nwhator et al. 2014; Pergialiotis 2018.)

Like male germ cells and fertility, oxidative stress also affects female germ cells and fertility. Oxidative stress affects many physiological events in a woman's reproductive health. It affects the maturation of the ovum and ovulation, as well as the attachment, growth and differentiation of the blastocyst. Oxidative stress interferes with the normal endocrine system, causing hormonal imbalance. Under oxidative stress, the DNA of the ovum may be damaged. (Agarwalet et al. 2012.)

Periodontitis is an inflammation of the oral area, but it causes an inflammatory condition throughout the body (Rashidi Mayfodi & Iranaq 2017). It increases the risk of endometritis, endometrial inflammation (Agarwalet et al. 2012; Rashidi Mayfodi & Iranaq 2017). Inflammation of the mouth appears to complicate and prolong pregnancy (Rashidi Mayfodi & Iranaq 2017). Oxidative stress is suspected to cause these problems as well (Agarwalet et al. 2012).

Inflammation in the mouth and body's mechanisms to prevent and heal inflammation affects the hormonal balance strongly. Normal hormonal balance is a prerequisite for ovarian function, cyclic changes of the endometrium, as well as the development of the embryo and its' implantation. (Rashidi Mayfodi & Iranaq 2017.)

## Effect of oral health on pregnancy

Problems with oral health during pregnancy can affect pregnancy, the developing fetus and the child after birth. High concentrations of bacteria that cause caries in the mother's mouth increases the risk of caries in the child's mouth. Gingivitis and periodontitis increase the risk of premature births, low birth weight and pre-eclampsia. (Bogges & Edelstein 2006; Agarwalet et al. 2012.) Oxidative stress caused by oral inflammation increases the risk of miscarriages, premature births and pre-eclampsia (Agarwalet et al. 2012).

A change in the endocrine system in pregnant women also causes acidification of the mouth and the pH of saliva is lower than usual. One of the purposes of saliva is to restore the pH of the mouth to normal after eating. Since the pH of saliva has changed during pregnancy, its corrective effect is impaired. Demineralization of the enamel may happen when the saliva's pH is low. As demineralization progresses, so does the carious lesion. This causes the risk of tooth decay to increase. (Heikka et al. 2015.)

Nausea and hyperemesis gravidarum increases oral acidity and vomiting may corrode tooth enamel (Bogges & Edelstein 2006; Heikka et al. 2015). Nausea is often prevented by eating small snacks. Pregnant women may also have cravings and snack many times per day. However, snacks and snacking cause acid attacks on the teeth. Since the pH of saliva has already changed due to the endocrine function and the ability to restore the pH of the mouth to normal is weakened, an acid attack strikes the teeth harder than usual. (Heikka et al. 2015.) So snacking means repeated hard acid attacks to the teeth, challenging the normal pH of the mouth and leading to impaired oral health.

## Overview

Dental care before pregnancy is essential for good fertility and healthy pregnancy. It is important to ensure that the teeth, gums; the whole mouth is well taken care of. Good oral health plays an important role in the health and well-being of women, men, and children. Smoking and the use of tobacco products (snuff and snorting) significantly reduces oral health. Pregnancy is a time when the family is motivated to make lifestyle changes to improve their future health. This time should be utilized. By increasing the knowledge of healthcare professionals, the counselling and guidance in family planning and during pregnancy is motivating and effective.

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