

Impact of obesity on breast cancer, endometrial cancer, fertility and complications in pregnancy

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Abstract

Obesity is a well-known risk factor for breast cancer and endometrial cancer. It also increases the risk for a poor outcome of desiderum infantum and the risk for complications in pregnancy. Weight reduction can reduce the increased risk again. Obese women should be strongly encouraged to reduce their BMI and should be educated about the detrimental effects of obesity by their physicians. Whereas physical activity and healthy nutrition are the most important factors in obtaining a normal bodyweight, not every woman will reach a BMI reducing her risk for the conditions mentioned above. In these cases bariatric surgery is a potential management option.

Introduction

Obesity is a well known risk factor for the development of cardiac and endocrine disorders. But the consequences of obesity are not limited to internal medicine, they are evident in almost every field of medicine. Especially the endocrine consequences have an impact on the field of gynecology and obstetrics. We took a look at the published data concerning breast cancer, endometrial cancer, fertility and pregnancy.

Breast cancer

Whereas obesity reduces the risk to develop a premenopausal breast cancer [1-3], it increases the risk to develop a postmenopausal breast cancer [1-4]. About 25% of breast cancer cases after menopause are caused by obesity [1, 2]. A weight gain of only 10 kg between the age of 18 and menopause increases the risk for a postmenopausal breast cancer by 16% [5,6]. A BMI over 25 increases the breast cancer risk proportionally. Per 5 BMI-units this increase lies within the range of 12-20% [1-4]. But obesity does not only increase the risk of developing breast cancer, it also is correlated with a shorter overall survival in patients who are diagnosed with the disease [7]. A BMI higher than 27 triples the risk of a breast cancer patient to die because of the disease [8,9]. The main reason for the increased risk of obese women to develop breast cancer and to die from it is the production of estrogen and growth factors in fat tissue, especially in abdominal fat [10]. The reduction of body weight leads to a decrease of the risk for breast cancer [11].

Endometrial cancer

Obesity is a well-known risk factor for endometrial cancer, with a direct link between bodyweight and the risk of developing the disease [1]. The fact of being obese increases the risk of a woman for endometrial cancer by the factor two to three [12,13]. An overweight of 50 pounds increases the risk by the factor 10 [14]. And whereas endometrial cancer is a curable disease the risk of dying of it is also increased for obese women [15,16]. The explanation for the increased risk for endometrial cancer is the “unopposed estrogen hypothesis”, based on the knowledge that the increased estrogen and androgen

levels as well as the resulting hyperinsulinaemia in obese women lead to mitogenous effects on the endometrium especially after menopause, when they are no longer opposed by progestin [17]. Weight loss reduces the cancer risk in obese women [18,19]. There are first data that weight loss after bariatric surgery may reduce the risk for endometrial cancer by as much as 70%, if the women do not put on weight again [20].

Fertility

Obesity has a detrimental effect on female fertility [21]. Whereas the relative risk of infertility because of anovulatory cycles is 2.7 in women whose BMI is higher than 32 at the age of 18 [22], even in women who are having ovulatory cycles the chance of conception is decreased by 5% for every increase of the BMI by one unit [23]. The reasons for this decrease in fertility are multivariate, including higher leptin and lower adiponectin levels, thus influencing the expression of steroids in the ovaries and increasing the insulin levels resulting in a hyperandrogenaemia by inhibiting the sex hormone binding globulin production in the liver [23,24]. Another reason for reduced fertility is the higher incidence of the polycystic ovary syndrome in obese women [25]. Weight loss in women with polycystic ovary syndrome, obtained by lifestyle therapy, pharmacological therapy or bariatric surgery, improves spontaneous ovulation and pregnancy rates [25]. Since weight loss prior to conception improves live birth rates in obese women with or without polycystic ovary syndrome, it has to be considered the first line therapy for infertility in obese women [26].

Complications in pregnancy

Obesity increases the risk of pregnant women for suffering of

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complications in pregnancy, such as preeclampsia, hypertension, gestational diabetes and delivery by cesarean section [27-30]. But not only is the pregnant woman herself at risk. Children of obese pregnant women are at a higher risk for stillbirth, prematurity, congenital abnormalities, macrosomia and obesity in childhood [31,32]. With a BMI between 30 and 39.9 the relative risk for gestational diabetes is up to 4,0, the relative risk for gestational hypertension up to 3,2 and the risk for preeclampsia up to 3,3, in relation to the BMI [30]. Therefore preconception assessment of and counseling on obesity are highly encouraged [33]. If a normal body weight cannot be obtained by conservative treatment, bariatric surgery can be considered. After bariatric surgery pregnancy complications like gestational diabetes, preeclampsia, gestational hypertension and macrosomia are less likely to occur [34,35].

Conclusion

Obesity in women increases the risk of developing breast cancer and endometrial cancer, being infertile and suffering from complications in pregnancy. Obese women should be strongly encouraged to reduce their BMI and should be educated about the detrimental effects of obesity by their physicians. Whereas physical activity and healthy nutrition are the most important factors in obtaining a normal bodyweight, not every woman will reach a BMI reducing her risk for the conditions mentioned above. In these cases bariatric surgery is a potential management option.

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