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Introduction

Nowadays, obesity is rising at an alarming rate in both developed and developing countries. Maternal pre-pregnancy obesity has been previously correlated to both obstetrical and neonatal implications. Additionally, maternal pre-pregnancy obesity could play an influencing role and have a dynamic impact in later somatometrical characteristics of the offspring born by obese mothers. The aim of our study was to evaluate the impact of maternal pre-pregnancy obesity in specific obstetrical and neonatal outcomes and also to define its impact on children's later life.

Methods

A systematic review was conducted (bibliography from years 2000-2010, Pubmed), concerning maternal pre-pregnancy obesity and its impact on both mother and child. In our analysis were included papers that referred to singleton pregnancies, but were not complicated by diabetes mellitus (pregnancy induced, type 1 or 2). Multiple gestation pregnancies were excluded. There were 95 papers included in the analysis, while as obese are defined these women who have BMI equal to or over 30.

Results

Maternal pre-pregnancy obesity was associated with :

a. Fertility: Obese women face fertility problems as a result of high levels of androgens, insulin and resistance to insulin, which may influence ovaries function. Central adiposity (apple body-type) is a potential risk factor for endocrinology disorders. It is estimated that 10 - 15% of weight reduction, in overweight women, leads to 30% increase in conception.

b. Pregnancy induced hypertension, Preeclampsia, Eclampsia: Hypertension disorders affect almost 6.7% pregnancies of women with normal BMI. Most researchers found a clear, independent relationship between maternal obesity and hypertension disorders (incidence up to 21.2% in morbid obese women).

c. Cesarean section : All researchers found a positive relationship between obesity and cesarean section. There is a dose dependent correlation between high BMI and incidence of cesarean section. For one unit increase in BMI, ORs of cesarean section increase by 7%.

d. Apgar score : Maternal obesity was correlated to neonatal low Apgar score (4-6). Additionally, as BMI increases, the incidence of neonatal low Apgar score increases.

e. Birthweight : Neonatal hyperglycemia and hyperinsulinemia are responsible for acceleration of fetal growth. Neonates born to obese mothers tend to be macrosomic ($BW \geq 4000\text{gr}$). The increase of one unit in BMI (≥ 30), increases the risk (OR) by 1.1.

f. NICU admission : Many studies focused on neonates of obese mothers, who have a tendency towards admission to an NICU. Although the exact causes of this are not known, it is possible that higher rates of neonatal morbidity (prematurity, hypoglycemia, susceptibility to infections, birth trauma, macrosomia) in neonates of obese mothers, could be responsible for this.

g. Premature labor : The correlation between maternal obesity and premature labor remains controversial.

h. Congenital anomalies: A higher incidence towards congenital anomalies was found in pregnancies complicated by obesity (anencephaly, spina bifida, rectal atresia, hypospadias, omphalocele etc). However, some researchers do not support this relationship. Further studies, in that field, are required in order to gain a clear image.

i. Respiratory disorders: There is a positive relationship between maternal pre-pregnancy obesity and asthma during infancy. Maternal obesity could play a crucial role, influencing in early stages fetal lung formation and also development of immune system.

j. Somatometrical characteristics of childhood: Few studies have focused on children born by obese mothers, where a tendency towards higher BMI in children, was found in 14 months of age, 5,7,9 and 11 years old. This correlation was stronger in male offspring.

Conclusion

Maternal pre-pregnancy obesity has a negative impact in fertility, hypertension disorders during pregnancy, cesarean section, neonatal birthweight, Apgar score, admission to NICU and respiratory disorders during childhood. More research is required in certain fields such as premature labor, congenital anomalies and children's obesity.

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