

Impact of diabetes mellitus and obesity on delivery outcomes

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Apstrakt

Diabetes mellitus (DM) and maternal obesity are in parallel related with adverse maternal and neonatal outcomes. Examination of the combined association of these common metabolic problems with pregnancy outcomes is an important question. Objective of our study was to determine associations of diabetes mellitus and obesity with adverse delivery outcomes. The primary outcome measures were duration of labor, mode of delivery, Apgar scores in 1st and 5th minute, obstetric interventions and maternal injuries at births. Women with DM were more likely to have Cesarean Section ($p < 0.01$) and less likely to have had an episiotomy and perineal repair than women without DM (all $p < 0.05$). Connections between DM and obesity with other adverse outcomes of labor have not been found.

Ključne reči: diabetes mellitus, obesity, delivery outcomes

Introduction

The prevalence of diabetes, overweight and obesity have considerably amplified in the last decades. Diabetes mellitus (DM) and maternal obesity are in parallel related with adverse maternal and neonatal outcomes^{1, 2}. Both share familiar metabolic characteristics such as increased insulin resistance, hyperglycemia, and hyperinsulinemia, and DM may impart distinct effects on clinical outcomes independent of obesity alone. The same is true for maternal obesity, even though dissimilarities in metabolism may also be present among certain ethnic groups³. For that reason, examination of the combined association of these common metabolic problems with pregnancy outcomes is an important question.

Fetal distress, meconium staining, arrest disorders, hemorrhage, complex peridural access and operatory time are also increased in obese women and pregnant women with DM. Furthermore, evidence of increased risk for cesarean section, endometritis, prolonged hospital stay, thromboembolic phenomena, anemia, urinary tract infection, prematurity and fetal demise have been described⁴.

Objective of our study was to determine associations of diabetes mellitus and obesity with adverse delivery outcomes.

Uticaj dijabetesa i gojaznosti na ishod porođaja

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Abstract

Dijabetes mellitus (DM) i maternalna gojaznost su povezane sa neželjenim perinatalnim ishodima. Procena uticaja udruženosti ovih entiteta na ishod trudnoće je od velikog značaja.

Cilj studije je bilo određivanje povezanosti DM i maternalne gojaznosti sa neželjenim ishodima porođaja.

Evaluirani su trajanje i način završavanja porođaja, Apgar skor u prvom i petom minute, akušerske intervencije i maternalne porođajne povrede.

Žene sa DM-om su češće imale Carski rez ($p < 0.01$), a rede epiziotomiju i rascep mećice u odnosu na trudnice bez DM-a (all $p < 0.05$). Povezanost DM-a i gojaznosti sa drugim neželjenim ishodima porođaja nisu nađene.

Keywords: dijabetes mellitus, gojaznost, ishod porođaja

Materials and Methods

In our retrospective cohort study, the clinical database of births in University Clinic for Gynecology and Obstetrics “Narodni front”, Belgrade, Serbia from April the 1st 2013 to 30th of June 2013 was used. University Clinic for Gynecology and Obstetrics “Narodni front” is a tertiary referral hospital in Belgrade, Serbia with a different ethnic populace and roughly 7000 deliveries per annum. The database of births consists of de-identified collected maternity data for all births in the clinic, which includes demographic data, antenatal complications, and detailed delivery and newborn data. Maternal body mass index (BMI) was calculated using maternal height and weight measured to the nearest centimeter and kilogram, and obesity was defined as BMI > 30 kg/m². The primary outcome measures were duration of labor, mode of delivery, Apgar scores in 1st and 5th minute, obstetric interventions and maternal injuries at births.

Results

The prevalence of DM in our study population was 9.95%. Table 1. shows the characteristics of study population and observed outcomes in subgroups of DM and Non DM mothers. The prevalence of obesity within DM women was 6.45%.

	Non DM	DM	p
N (% within all deliveries)	1403 (90.05)	155 (9.95)	NA
Characteristics of study population and observed outcomes	N (% within subgroup)	N (% within subgroup)	
Age*	33.2±5.0	34.7±4.89	>0.05
Primigravida	756 (53.88%)	79 (50.97%)	>0.05
Secundigravida	488 (34.78%)	54 (34.84%)	>0.05
Tercigravida	127 (9.05%)	14 (9.03%)	>0.05
Multiparity	37 (2.64%)	3 (1.93%)	>0.05
Twins	46 (3.28%)	5 (3.23%)	>0.05
Triplets	4 (0.28%)	0 (0%)	>0.05
Breech presentation	9 (0.64%)	1 (0.64%)	>0.05
Gestational week at delivery*	38.1±2.32	39.1±2.31	>0.05
Labor duration in minutes*	253±199	249±262	>0.05
Episiotomy	675 (48.11%)	63 (40.64%)	<0.05
Repair of vaginal mucosa	83 (5.92%)	2 (1.29%)	<0.05
Perineal repair	131 (9.34%)	14 (9.03%)	>0.05
Ventouse-assisted birth	26 (1.85%)	4 (2.58%)	>0.05
Forceps	0 (0%)	0 (0%)	NA
Cesarean Section	403 (28.72%)	58 (37.45%)	<0.01

Table 1. Characteristics of study population and observed outcomes in subgroups of DM and Non DM mothers

*- is presented as mean ±SD; NA – not applicable; N - Total number;

Characteristics of study population and observed outcomes in subgroups of DM Obese and DM Non Obese mothers are presented in Table 2.

Group	Obese DM (X±SD)	Non Obese DM (X±SD)	p
Age (year)	34,2±5,1	33,7±4,9	>0.5
Gestation age	38,5±2,2	39,0±1,9	>0.5
Labor duration (minutes)	241±268	214±178	>0.5
Birth weight (in grams)	3545±435	3400±561	>0.5
Birth length (in cm)	51,6±1,5	51,2±2,89	>0.5
Apgar score (1 st minute)	8,8±0,79	8,9±1,25	>0.5
Apgar score (5 th minute)	9,5±0,91	9,6±1,14	>0.5

Table 2. Characteristics of study population and observed outcomes in subgroups of DM Obese and DM Non Obese mothers

Conclusions

The association of Cesarean Section and DM seems to be a fact ^{1,2,4}. Without going into the causes for this association, our observation that women with DM were more likely to have Cesarean Section, confirms this coherence. In relation to observed variables, women who had DM were less likely to have had an episiotomy and perineal repair than women without DM (all $p < 0.005$). This might be explained with the higher Cesarean Section rates in population of women with DM, bearing in mind that caesarean section excludes the creation of these injuries. Obesity and greater weight gain independently increase the risk of cesarean delivery, prolonged duration of labor, as well as of several adverse outcomes with vaginal delivery^{4,5}, although our study could not confirm this statement. This is probably due to the fact that our study involved insufficient number of obese women with DM. Large prospected studies are needed for further evaluation of risks of adverse outcomes of delivery related with DM and obesity.

Literature

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