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Mode of delivery of obese fetuses: A dilemma hardening the decision-making

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ABSTRACT

We aimed to review the delivery mode of overweight fetuses (> 4000 g). We retrospectively evaluated 11418 deliveries in our hospital, and found 573 overweight neonates with a rate of 5%. The total cesarean section (CS) rate was 72.1% for overweight fetuses; whereas overall total CS rate was 52.9% at the same period. The stillbirth rate was 1.1% in the overweight fetuses. The birthweights of 511 (89.2%) subjects were between 4000 and 4499 g, whereas the birthweights of 55 (9.6%) and 7 (1.2%) overweight neonates were between 4500 and 4999 and ≥ 5000 g, respectively. Carbohydrate metabolism disorders in pregnancy were recorded only in 107 cases (18.67%). Prenatally suspected overweight fetuses (> 4000 g) seem to concern obstetricians while decision-making about the delivery mode, which is why a high CS rate was recorded for overweight fetuses.

1. Introduction

The delivery mode of overweight fetuses is a serious challenge in obstetrics (Langer et al., 1991; Chauhan et al., 2005). Moreover, it is not clear which fetuses are really macrosomic. The most common cut-off is 4000 gr; however some other studies accept 4500 gr as a threshold value. Different ethnic and geographic features may effect the fetal growth; fetuses with same birthweight may be categorized into normal or macrosomic group in different countries (Menticoglou et al., 1992; Boulet et al., 2003). Even there is not a worldwide accepted accurate definition of macrosomia; it is hard to decide how to deliver these big babies.

Higher rates of perinatal complications were reported for pregnancies/deliveries with fetuses over 4000 g (Langer et al., 1991; Esakoff et al., 2009). Shoulder dystocia, brachial plexus injury, clavicle fracture and asphyxa are the main concerns for clinicians during intrapartum monitoring. The rates of cesarean section (CS) and operative deliveries (OD) were reported to be higher for these pregnancies to avoid such complications (Conway and Langer, 1998; Weeks et al., 1995). Vaginal delivery may end without any maternal or fetal complication in some cases whereas it is not always possible to predict the outcome for mother and fetus. This undetermined and confusing process push obstetricians to perform CS in most countries (Lipscomb et al., 1995), (Kolderup et al., 1997; Bjørstad et al., 2010). For this reason, there is a tendency for performing CS when the probable birthweight is estimated to be > 4000 g not to have medico-legal problems (Draycott et al., 2005; Sokol and Blackwell, 2003).

Turkish Republic Ministry of Health published a "Management Guide for Birth and Cesarean" in 2010. According to this guideline, vaginal delivery can be attempted in nondiabetic women with an estimated fetal weight of 4000–4500 g (after discussing all risks and benefits with the mother). Intrapartum follow-up should be done carefully, progresses should be recorded using the partograph. Augmentation and induction can be used to help the labor (it should be noted that cesarean rates increase). If prolonged labor is considered, CS should be performed. Also, CS should be recommended for nulliparous pregnancies with EFW > 4500 gr and for diabetic mothers > 4000 gr (TC Saglık Bakanlıgı, 2010).

In this study, we have retrospectively evaluated the CS rates of the deliveries of fetuses with birthweights > 4000 g.

2. Methods

We have retrospectively evaluated 11418 deliveries between 2002 and 2008 in our hospital and found 573 overweight neonates (birthweight > 4000 g). The personal, epidemiological, and necessary clinical/obstetrics data were retrieved from the electronic registry of Hacettepe University Hospital. The perinatology database was used for

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the retrieval of gestational information. Leopold's maneuver and ultrasonographic evaluation (mainly labor room ultrasonography at the beginning of the first stage of labor) were the main tools used antenatally for the designation of overweight fetuses.

The study protocol was approved by Hacettepe University Ethics Committee with the approval number of GO17-426.

3. Results

We have shown that 5% (n = 573) of the birthweights were > 4000 g. We found that 70% of these overweight fetuses were male, whereas 30% were female.

CS rate was 72.1% (413/573) for overweight fetuses, whereas the overall total CS rate was 52.9%, for 2002–2008. The stillbirth rate was 1.1% (6/573) in the study group (3 congenital malformations, 1 hydrops fetalis, and 2 others).

We found that 511 (89.2%, 511/573) of the study subjects were between 4000 and 4499 g (group 1), whereas the birthweights of 55 (9.6%, 55/573) and 7 (1.2%, 7/573) were between 4500 and 4999 (group 2) and ≥5000 g (group 3), respectively. The mean ± SD values of the birthweights of groups 1, 2, and 3 were 4143.7 ± 121.4 g, 4636.9 ± 116, and 5230.0 ± 351.6 g, respectively.

We could not demonstrate a statistically significant difference in the CS rates in between groups. Table 1 shows the CS indications. Primary CS rate was 76.5% (316/413), with 25.6% being without obstetrical reasons (elective CS, tocophobia, physician's anxiety, medico-legal pressure, etc.).

Carbohydrate metabolism disorders in pregnancy were recorded in 107 of 573 cases (18.7%). Table 2 shows the type of disorders. The CS rate in this group was 90.7% (97/107, 74 primary CS and 23 repeat CS).

4. Discussion

Pregnancies with macrosomic fetuses need special care because serious complications may occur not only at birth, but also during the antenatal period because of metabolic disorders (Esakoff et al., 2009; Aka et al., 2011; Das et al., 2009). The challenge is with the definition of macrosomia, which is also a challenge in this field. "*How big?*" and "*Why big?*" are the questions to be answered.

The fetal weight is critical during delivery. Thus, the cut-off value for overweight used to decide the delivery mode is very important. Various studies used different cut-off values for fetal macrosomia (Langer et al., 1991; Menticoglou et al., 1992; Duryea et al., 2014; Cheng and Lao, 2014). Another crucial debate is on the methodology of the estimation of birthweight during antenatal care examinations. Physicians should be careful during birthweight estimation not to have medical and legal problems. The general trend in our institution is to perform labor room ultrasonography.

The other important issue is the pathophysiological events behind macrosomia. The medical reasons for having overweight fetuses are varied. However, the impaired metabolisms of the mothers and fetuses in such cases are yet to be explained. The crucial matter is to decide whether the overweight fetus is macrosomic (with metabolic disorders) or with excess weight (fetal obesity, big baby, etc) to provide better management protocols.

Table 1
Cesarean section indications.

		n	Percent
Repeat CS		97	23.5
Primary CS		316	76.5
	Dystocia	37	11.6
	Malpresentation	23	7.3
	Emergency/AFD	28	8.9
	Maternal Disorders	146	46.2
	Elective CS (patient request, medical anxiety)	82	26

(AFD: acute fetal distress, CS:cesarean section).

Table 2
Subgroup distribution of carbohydrate metabolism disorders.

	n	Percent
GDM A1	33	30.8
GDM A2	11	10.3
Type 1 DM	5	4.7
Type 2 DM	8	7.5
Abnormal screening (50 g GTT)	50	46.7
Total	107	100.0

(DM: diabetes mellitus, GDM: gestational diabetes mellitus, GTT: glucose tolerance test).

Obstetricians should be careful when the fetus is estimated to be heavier than expected because their decision-making is usually influenced by the presence of perinatal and maternal complications. Various studies reported increased CS rates for macrosomic or overweight fetuses for different cut-off values (Kolderup et al., 1997; Das et al., 2009; Duryea et al., 2014; Cheng and Lao, 2014; The Turkey Statistical In, 2017). In this study, we have shown that total CS rate is 72.1% for macrosomic fetuses. Interestingly, almost 2/3 of the > 4000-g babies in our study were male. The other critical finding is the rate of CS performed without obstetrical reasons (elective CS, physician's anxiety, tocophobia, etc.), which is 30%. Estimation of overweight fetuses during pregnancy seems to be a cause for concern among physicians, particularly during the course of decision-making for the delivery mode.

Total CS rate in 2017 was 53.1% in Turkey according to the data given in the Health Statistics Yearbook (The Turkey Statistical In, 2017). Aksoy et al. reported that most common CS indications were previous uterin surgery history, fetal distress and cephalopelvic disproportion in a Turkish tertiary hospital. Macrosomia was the main indication of CS deliveries with a rate of 4.6% (Aksoy et al., 2014). Another study from Turkey was conducted with 746 macrosomic neonates and CS rate was about 40% in their study. When indications were analyzed for the macrosomic babies; cephalopelvic disproportion, protraction and arrest disorders, previous uterin surgery and breech presentation were the leading reasons (Dane et al., 2009). Similar findings were observed in our study.

A previous study by Yumru et al. (2011), which included 11561 deliveries concluded that macrosomia rate was 7.7% and CS rate in these fetuses was 67%. Ergen E. reported the fetal and maternal complications in macrosomic fetuses (> 4500 g) in another Turkish hospital. Total CS rate was 78%. Shoulder dystocia and related complications was noted in 8 out of 243 neonates (Ergen, 2018). These findings together with the present study show that there is a tendency to choose CS for the deliveries of macrosomic fetuses in Turkey.

Carbohydrate metabolism disorders related to macrosomic or overweight fetuses comprise 18.7% of fetuses in our study. The general trend in the management of big fetuses during antenatal follow-up is to concentrate on diabetic processes. However, our findings show that it is not only carbohydrate metabolism disorders, but also other metabolic pathway disorders that are responsible from uncontrolled fetal growth.

Limitations of this short review of our cases were the lack of information related to neonatal outcomes and the absence of the possible causes for overweight fetuses other than carbohydrate metabolism evaluation. This paper is written to emphasize the redundantly high rates of CS for antenatally suspected and postnatally confirmed overweight fetuses.

This study attracts attention to the fact that overweight fetuses may augment cesarean rates due to non-obstetrical reasons. In conclusion, antenatally suspected overweight fetuses seem to concern obstetricians in their decision-making. Using a cutoff of 4000 g is a controversial issue in clinical practice.

Conflict of interest

The authors declare no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.obmed.2019.01.003.

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