

# Evaluation of Perinatal and Maternal Complications Type of Deliveries and Neonatal Outcomes in Macrosomic and Normal Weighed Newborns in Our Clinic Between 2000 and 2010 Years

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**OBJECTIVE:** The aim of this study was to evaluate the perinatal and maternal complications, the type of the deliveries and neonatal outcomes in the patients whose newborns were weighing 4000gr and above (macrosomic) and between 2500-3999gr (normal).

**STUDY DESIGN:** This retrospective study was done based upon the records of the patients who had given birth between 01.01.2000 and 31.06.2010 in Department of Obstetrics in Haydarpasa Numune Education and Research Hospital. There were totally 9406 patients. We included 1331 patients to our study. In the study group (n=684) the newborns were weighing 4000 gr and above (macrosomic) and in the control group (n=647), who were selected randomly, the newborns were weighing 2500-3999gr (normal). The patients who had given birth before 37 weeks, the multiple gestations and intrauterin growth restricted babies were excluded from the control group.

**RESULTS:** Of the 684 macrosomic newborns, 566 of them (82.7%) were 4000-4499 gr, 104 of them (15.2%) were 4500-4999gr and 14 of them (2.1%) were 5000gr and above. Maternal complications were seen 24.4% in the study group, whereas 7.7% in the control group.

**CONCLUSION:** The risk of perinatal morbidity, maternal complications, birth trauma and neonatal complications were higher in the study group than in the control group. And this was statistically significant (p=0.0001).

**Key Words:** Macrosomia, Perinatal complications, Maternal complications, Birth trauma, Neonatal outcomes

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## Introduction

The weight of the newborn baby is one of the most important factor that effects the perinatal morbidity and mortality. Macrosomia can be defined as the fetal weight above 90th percentile according to the gestational age or  $\geq 4500$ gr at term.<sup>1,2</sup> There are a lot of intrapartum and postpartum risks both for the baby and the mother in case of macrosomia which are shoulder dystocia, clavicular fracture, brachial plexus injury, Klumpke palsy, low Apgar scores and even fetal death for the baby and urogenital traumas and postpartum hemorrhage for the mother.<sup>3,4</sup> Although ultrasound can be used to determine

the fetal weight, there is a fault rate of 10-15%, therefore caesarean section does not seem logic for the management of all these babies.<sup>5</sup>

The aim of our study was to evaluate the perinatal and maternal complications, the type of the deliveries and neonatal outcomes in the patients whose newborns were weighing 4000gr and above (macrosomic) and between 2500-3999 gr (normal).

## Material and Method

This retrospective study was done based upon the records of the patients who had given birth between 01.01.2000 and 31.06.2010 in Department of Obstetrics in Haydarpasa Numune Education and Research Hospital. There were totally 9406 patients. We included 1331 patients to our study. In the study group (n=684) the newborns were weighing 4000 gr and above ( macrosomic) and in the control group (n=647), who were selected randomly, the newborns were weighing 2500-3999gr (normal). The patients who were given birth before 37 weeks, the multiple gestations and intrauterin growth restricted babies were excluded from the control group.

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The age, gravidity and parity of the pregnant women, gestational weeks of the pregnancies, the birthweight of the newborns were investigated. The maternal complications which were perineal and periurethral lacerations, uterine atony and infections were evaluated. The newborns were examined by the pediatrician immediately after the birth. The neonatal complications which were perinatal asphyxia, meconium aspiration and metabolic complications were evaluated. Asphyxia was determined by the 5<sup>th</sup> Apgar score which is less than 7, umbilical cord arterial pH<7.2 and the presence of hypoxic convulsions. Meconium aspiration was determined by clinical and radiologic parameters.

The type of the deliveries (spontaneous vaginal, by vacuum extraction and caesarean section) and shoulder dystocias were evaluated. The birth traumas of the babies (clavicular fracture, erb palsy, cephal hematomas), fetal deaths and their reasons were investigated.

Statistical analysis were made by SPSS for Windows standard version 11.5. Student-t test was used for demographic and clinical evaluations whereas chi-square test was used for evaluation of the type of the deliveries, maternal and perinatal complications.

## Results

In our clinic, there were totally 9406 deliveries. The number of birthweight of 4000 gr and above was 684 (7.2%), the number of birthweight of 4500 gr and above was 118 (1.2 %)

and the number of birthweight of 5000 gr and above was 14 (0.14%). Of the macrosomic 684 newborns, 566 of them (82.7%) were 4000-4499 gr, 104 of them (15.2%) were 4500-4999 gr and 14 of them (2.1%) were 5000 gr and above. Our heaviest newborn baby was 6500gr. The distribution of maternal age, gravidity, parity, the gestational week at birth and the weight of the newborn in both the study and control group is shown at Table 1.

The type of deliveries were evaluated and it was found that the caesarean section rate was 44.1% in 4000gr and above (302/684) whereas 18.2% in control group (118/647). There was statistically significant difference in type of deliveries (p=0.0001).

The relation of maternal complications and macrosomia are shown at Table 2

The shoulder dystocia was occurred in 2.8% (16/566) of babies weighing 4000-4499 gr, 19.2% (20/104) of babies weighing 4500-4999gr and 50% (7/14) of babies weighing 5000gr and above. The incidence of shoulder dystocia in babies weighing lower than 4000 gr was 0.2%(1/647). There was a statistically significant difference among the groups (p=0.0001). The incidence of shoulder dystocia in the group of 4500 gr and above should be taken into consideration. There were 19 clavicular fractures, 25 Erb palsies, 64 cephal hematomas, and 6 neonatal deaths because of birth trauma. The distribution of birth traumas and the weight of the newborns were shown at Table 3.

Table 1: The distribution of maternal age, gravidity, parity, the gestational week at birth and the weight of the newborn in both the study and control group

	2500-3999 gr Med+SD	4000 gr and above Med+SD	p value
Age (year)	25.7 ± 5.2	27.7 ± 5.6	0.0001
Gravida	2.1 ± 1.3	2.8 ± 1.6	0.0001
Para	0.8 ± 1.0	1.4 ± 1.3	0.0001
Gestational week at birth	39.1 ± 1.2	42.1 ± 2.8	0.0001
Weight of the newborn (gr)	3298 ± 335.5	4231.8 ± 269.8	0.0001

Table-2. The relation of macrosomia and maternal complications

	Perineal lacerations n (%)	Periurethral lacerations n (%)	Uterine atony n (%)	No complications n (%)	Totally n (%)
4000-4499 gr	57 (%10.1)	18 (%3.2)	6 (%1.1)	485 (%85.6)	566 (%100)
4500-4999 gr	48 (%46.1)	21 (%20.2)	3 (%2.9)	32 (%30.8)	104 (%100)
5000 gr and sbove	9 (%64.3)	5 (%35.7)	0	0	14 (%100)
2500-3999 gr	40 (%6.2)	6 (%0.9)	4 (%0.6)	597 (%92.3)	647 (%100)
Totally	154 (%11.6)	50 (%3.7)	13 (%0.9)	1114 (%83.8)	1331(%100)

Table 3: The distribution of birth traumas and the weight of the newborns

	No birth traumas n (%)	Clavicular fracture n (%)	Erb palsy (%)	Cephal hematoma n (%)	Klumpke palsy n (%)	Fetal deaths n (%)	Totally
4000-4499 gr	533 (%94.2)	16 (%2.8)	0	13 (%2.3)	0	4 (%0.7)	566 (%100)
4500-4999 gr	40 (%38.4)	3 (%2.9)	17 (%16.4)	42 (%40.4)	0	2 (%1.9)	104 (%100)
5000 gr and above	0	0	7 (%50)	7 (%50)	0	0	14 (%100)
2500-3999 gr	644 (%99.4)	0	1 (%0.2)	2 (%0.4)	0	0	647 (%100)
Totally	1217 (%91.4)	19 (%1.4)	25 (%1.9)	64 (%4.8)	0	6 (%0.5)	1331 (%100)

## Discussion

Nowadays, there is not an internationally acceptable definition of macrosomia, but today it is known that fetal weight above 4000-45000 gr or large for gestational age which means over 90% than expected gestational age is called macrosomia.<sup>1,2</sup> In 1991, ACOG determined 4500gr as cut-off value. The incidences of birthweights above 4000gr and above 4500 gr in literature are 6-10% and 0.8-1.2 % respectively.<sup>6,7</sup> In our study the incidences were found 7.27%(684/9406) and 1.2%(118/9406) respectively.

J. Berard et al. reported that the intrapartum risks were higher in macrosomic babies which results in the longer duration of second stage of labor. Therefore, caesarean section rate is expected to be higher because of shoulder dystocia.<sup>3</sup> They reported a failure rate of 46% in vaginal deliveries. There are three major parameters which accompany macrosomia; post-term pregnancies, diabetes and obesity. Boyd et al. reported that macrosomia took place in 21% among 42 weeks of gestations at birth.<sup>8</sup> Spellacy et al. reported the rate of macrosomia in postterm babies in 10.8% whereas J.Berard reported as 17%<sup>3,4</sup> In our study group, the incidence of macrosomia in gestational week of 41 and after was 30.1% and in control group, it was 10.4%.

Langer et al reported that the risk of shoulder dystocia was 21 times higher in the macrosomic babies who were weighing over 4500 gr.<sup>9</sup> Berard et al. reported this rate in 100 patients as 22%<sup>3</sup> In our study, the incidence of shoulder dystocia was found in 4000-4499 gr, 4500-4999 gr, 5000 gr and above and under 4000 gr were 2.8%, 19.2%, 50% and 0.2 % respectively. The results were found statistically significant among the groups (p=0.0001).

There are some studies which show the relation between macrosomia and asphyxia and meconium aspiration. E. Oral et al. reported that perinatal asphyxia was seen 4.5 times higher in the study group who were weighing 4000 gr and above at birth. But there was no statistically significant difference between meconium aspiration and infection.<sup>10</sup> In our study, it was found that perinatal morbidities were higher when the baby was weighing over 4500gr.

Spellacy et al. suggested caesarean section when the fetuses were weighing over 5.000 gr whereas J.Berard et al. suggested over 4.500gr.<sup>3,4</sup> But to prevent only 1 brachial plexus palsy, 3.700 patients had given birth by caesarean section whose babies are supposed to be 4.500 gr and above.<sup>11</sup> In our study, caesarean section rate was 44.1% in babies weighing 4000gr and above.

The maternal morbidities were also higher in macrosomic babies which were perineal, periurethral lacerations and uterine atony. In our study there were 94 perineal lacerations (13.7%), 44 periurethral lacerations (6.4%) and 9 uterine atony (1.3 %).

## Kliniğimizde 2000-2010 Yılları Arasında Normal Kiloda ve Makrozomik Doğan Bebeklerde Perinatal ve Maternal Komplikasyonların Doğum Şekillerinin ve Yenidoğan Sonuçlarının Değerlendirilmesi

**AMAÇ:** Bu çalışmanın amacı 4000 gr ve üzeri (makrozomik) ve 2500-3999 gr (normal) yenidoğan ağırlığına sahip hastalarda perinatal ve maternal komplikasyonları, doğum şekillerini ve neonatal sonuçları değerlendirmektir.

**GEREÇ VE YÖNTEM:** Bu retrospektif çalışma 01.01.2000 ve 31.06.2010 tarihleri arasında Haydarpaşa Numune Hastanesi Kadın Hastalıkları ve Doğum Kliniği'nde doğum yapan 9406 hastanın kayıtlarına göre yapıldı. Çalışmaya 1331 hasta dahil edildi. Çalışma grubuna 4000 gr ve üzeri (makrozomik) 684 hasta, kontrol grubuna rastgele seçilen 2500-3999 gr doğum ağırlığındaki 647 hasta alındı. Çalışmaya 37 haftadan önce doğum yapanlar, çoğul gebelikler ve intrauterin gelişme kısıtlılığı olan gebelikler dahil edilmedi.

**BULGULAR:** Makrozomik bebeklerin (n=684) 566'sı (%82,7) 4000-4499 gr, 104'ü (%15,2) 4500-4999 gr ve 14'ü (%2,14) 5000 gr ve üzerindedir. Çalışma grubunda maternal komplikasyonların görülme oranı %24,4 iken, kontrol grubunda bu oran %7,7 idi.

**SONUÇ:** Perinatal morbidite, maternal komplikasyon, doğum travması ve neonatal komplikasyon riskleri çalışma grubunda kontrol grubuna göre daha fazla görülmüş olup istatistiksel olarak anlamlıdır. (p=0,0001)

**Anahtar Kelimeler:** Makrozomi, Perinatal komplikasyonlar, Maternal komplikasyonlar, Doğum travması, Neonatal sonuçlar

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