

The Prevalence of Fetal Macrosomia at the Specialized Hospital of Gynecology and Obstetrics of Sidi Bel Abbes (West Of Algeria)

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Abstract

Introduction: Fetal macrosomia is generally defined as a birth weight greater than 4000 grams and it is related to some adverse neonatal outcomes and maternal complications. The aim of our work is to identify the clinical profile of mothers who give birth to a macrosomic infant, and to study the maternal complications associated with delivering infants with a birthweight of 4000 grams or greater.

Methods: We did both a retrospective and prospective study, we collected 970 births over a period of one year that ranged from 1st January 2012 to 31 December 2012 for the retrospective study using the archived files, and we recorded 130 birth in the first semester of 2013 for the prospective study by means of interviewing the mother, all births were collected in the specialized hospital center of Gynecology and Obstetrics in Sidi Bel Abbes.

Results: The frequency of macrosomia in our study was estimated at 10.19%. Fetal macrosomia was more frequent in mothers aged between 29 and 38 years, who were taller, multiparous, and obese, had diabetes and a history of macrosomia, and had a Fundal *height* greater than or equal to 34 cm. About the obstetric outcomes, caesarean was indicated in 45.72% of cases and vaginal delivery occurred in 53.90% of cases. The percentage of neonatal morbidity was 4.55%, it was dominated by neonatal infections (4%), and obstetric trauma dominated by shoulder dystocia (0.55%). No maternal deaths were reported in our study

Conclusion: The evaluation of the obstetrical management in our series is acceptable given the good neonatal outcomes but is still limited because of insufficient technical capacity, and more efforts should be made for a better monitoring of pregnant women to detect patients at risk such as patient having obesity and diabetes in order to improve maternal and fetal prognosis.

Keywords: Macrosomia-risk factors; Sidi bel abbes

Introduction

Research have shown that there has been an increase in the means of the birth weight since 1980, and this means an increase in the proportion of macrosomia, which is defined as a birthweight greater than 4000 g [1-4].

It is important to understand and study the risk factors related to macrosomia because the health affect it can have for both mothers and infants, For the infants, some consequence are birth trauma [5] or even neonatal mortality that can be caused by birth asphyxia or some metabolic disorders, other consequence include shoulder dystocia, meconium aspiration and birth injurie [6-10], some long-term consequences caused by macrosomia include a higher predisposition to develop obesity and type 2 diabetes later in life [11].

Macromsomia does not affect only the infant but it has also negative effect on the mother, These negative effect have been identified by comparing women delivering macrosomic infant to women delivering non-macrosomic infant, this way using fetal birth weight as a primary risk factor [6-8,12,13].

Some of the maternal complications associated with the delivery of macrosomic infants include postpartum hemorrhage, [14] postpartum infection and laceration of the anal sphincter [15,16].

The aim of this study is to identify the clinical profile of mothers who delivered a macrosomci infant and to determine the specific characteristics of these pregnancies in order of find out some element of prevention and also the action that need to be taken when faced with macrosomia.

Methods

We report in this work the results of a retrospective study of 970 deliveries of macrosomic infants collected using the archived files for a period of 1 year that ranged from the 1st January 2012 to 31 December 2012, and the results of a prospective study of about 130 deliveries of macrosomic infant conducted in the Obstetrics and Gynecology Service of the Maternity of Sidi Bel Abbes for a period of 5 month from January 2013 to May 2013.

For the prospective study we interviewed the mother using a special questionnaire that included:

Maternal characteristics (Age-Medical health issue-Weight – heigh - Blood pressure, Funder height, Terms of delivery).

And fetal characteristics (birth weight - Apgar score- fetal sex - fetal morbidity and mortality).

For statistical analysis, the data were entered and analyzed by the Windows Excel (2007) and Statview software (1997). Measure the association between macrosomia and risk factors were performed using a logistic regression model. The results are given in the form of tables and histograms. The calculation of correlation coefficients was made by (the correlation matrix).

Results

In our study, the frequency of newborns with birth weight is greater than or equal to 4000 grammes is 10.19% the Birth weight ranged between 4000 and 6300g. The majority of newborns had a birth weight between 4000 and 4400 g (80%), (Table 1).

We found that the sex of the newborn influenced the birth weight, the male infant were more at risk of being macrosomic with 58% of all macrosomic babies being male, Neonatal morbidity was dominated by neonatal infections (88%), followed by injuries, the most common one was shoulder dystocia.

| Birth weight (grams) | n (%) |
|---------------------------------|-------------|
| < 4500 | 988(89.81%) |
| ≥4500 | 112(10.19%) |
| Macrosomic birth weight (grams) | |
| 4000-4400 | 89(80%) |
| 4400-4800 | 17(15.18%) |
| 4800-5200 | 3(3.36%) |
| 5200-5600 | 2(1.27%) |
| >5600 | 1(0.18%) |
| Mother's age (years) | |
| 18-28 | 374(34%) |
| 29-38 | 613(55.73%) |
| 39-48 | 110(10%) |
| >48 | 3(0.18%) |
| Fundel Hight (cm) | |
| 28-30 | 52(4.73%) |
| 31-33 | 510(46.36%) |
| 34-36 | 422(38.36%) |
| 37-39 | 92(8.36%) |
| >39 | 9(0.82%) |
| Unkown | 15(1.36%) |
| Mother's parity | |
| primiparous | 217(19.73%) |
| secondiparous | 301(27.36%) |

| multiparous | 509(46.27%) |
|----------------------|-------------|
| Large multipar | 66(6%) |
| us | 7(0.64%) |
| unknown | |
| Mother's weight (Kg) | |
| <60 | 17(1.55%) |
| 60-70 | 329(29.91%) |
| 71-80 | 551(50.09%) |
| 81-90 | 187(17%) |
| >90 | 9(0.82%) |
| Unkown | 7(0.63%) |
| Mother's height (cm) | |
| 155-160 | 115(10.45%) |
| 161-165 | 255(23.18%) |
| 166-170 | 429(39%) |
| 71-175 | 222(20.18%) |
| 176-180 | 72(6.55%) |
| Unknown | 7(0.64%) |

Table 1: Mother's and new born characteristics

About the nature of presentations the cephalic presentation was the most frequent in with 94.64%, regarding births deliveries the cesarean rate was 45.72% in our series, and the rate of normal deliveries was 53%.

The main indication for caesarean was the lack of engagement at full dilation with (44%), followed by stationary dilatation with a percentage of (23%), (Figure 1).

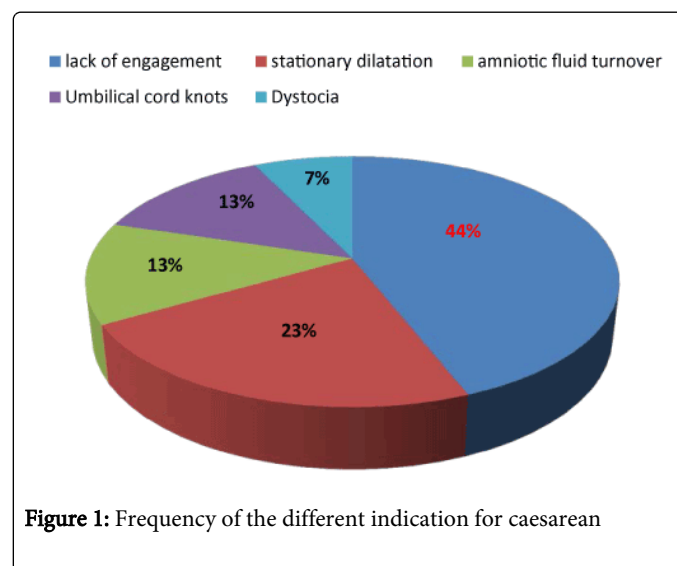


Figure 1: Frequency of the different indication for caesarean

About maternal factors the maternal age ranged between 18 and 50 years and the maximum frequency of macrosomia was observed between 29 and 38 years (55.73%) (Table 1).

The average Fundel Hight in our study was between 28 and 46 cm, and the maximum frequency was observed in between 31 and 33 cm with (46.36%) (Table 1).

Concerning parity the higher frequency was observed in multiparous women (between 3-5 pregnancies), with 509 cases, (46.27%) (Table 1).

The maternal weight varied between 59 and 100 Kg. The average maternal weight was 74.53 Kg and mothers with more than 70 Kg weight accounted for (67.91%) (Table 1).

Maternal height varied between 1.55 m and 1.80 m. The mean maternal height was 1.68 m. and the maximum frequency was found between 1.66 and 1.70 m, representing (39%).

In our study 20 mothers had diabetics, 11 of them had type 2 diabetics, and 9 had type 1 diabetes, but it was hypertension that presented the main pathology associated with pregnancy with (59%), and (27%) for gestational diabetes (Figure 2).

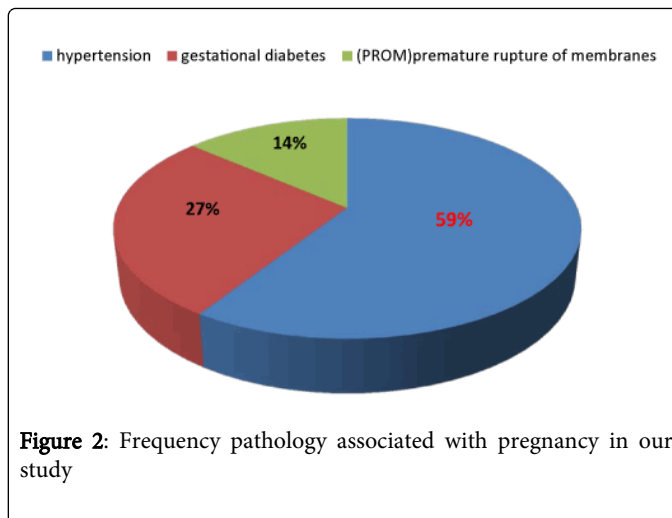


Figure 2: Frequency pathology associated with pregnancy in our study

About the correlation, no correlation was found between the weight of the newborn and the different parameters respectively fundel height ($R=0.04$), maternal age ($R=0.03$), and maternal weight ($R=-0.02$). However correlation was found between maternal height and birth weight ($R=0.41$) (Figure 3).

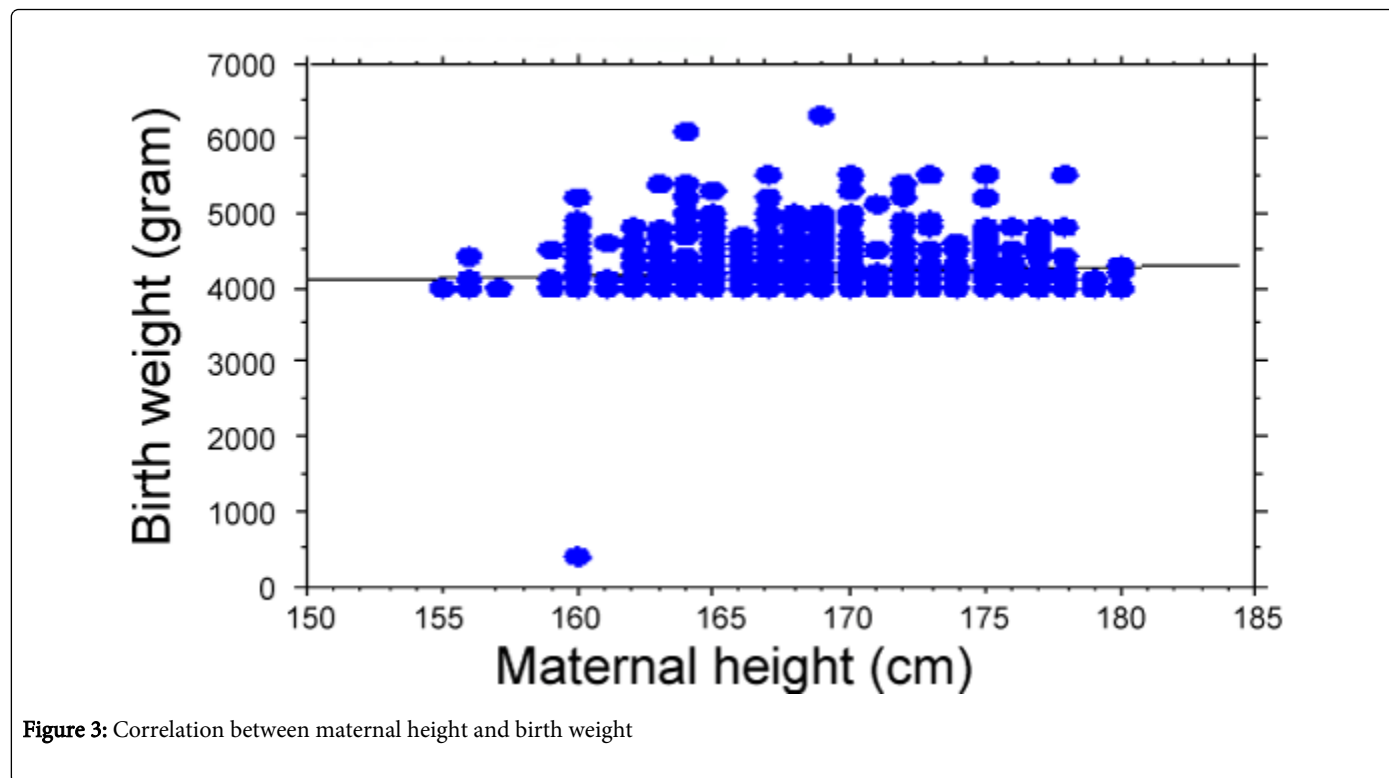


Figure 3: Correlation between maternal height and birth weight

Discussion

There is no consensus on the definition of fetal macrosomia. Different authors use different definition some define it as a birth weight greater than 4000 g, 4500 g or greater than 5000 g, or above the 90th percentile for a given gestational age [17,18]. Therefore, the prevalence of fetal macrosomia varies between 0.5-15% according to the definition used.

In our study the frequency of macrosomia is 10% which is consistent with one study [19] that found 11% but it does not match some other studies [17-22]; where they found a lower frequency of macrosomia

Concerning the weight of the new born we found that the higher percentage was between 4000 and 4400 g in 80% of cases. The same results were reported by most authors [23-25], we found a relationship between the sex of the infant and the birth weight, in our study the

macrosomia was more dominant in male with 58%, this is consistent with most authors [24-27].

The cephalic presentation was the most frequent one in our series with 95%, which is consistent with several studies [24,28-30].

The percentage of cesarean was 45.72% in our series; this result does not accord with the literature [21,30-32] where the rate of cesarean is lower, normal delivery was estimated to be 53% which is consistent with the finding of other authors [29,30,33] and the forceps was performed only 4 times in our series.

The majority of mothers in our study were aged more than 29 years (55.73%), which correspond to other data from several authors [32-34], In the study of Essel et al. the mother under 20 years constituted 5.7% of the series, and mother over 40 years constituted 4.9% of the series [35], there was a predominance of multiparous mother with percentage of (47.27%). Most studies have reported the same results [22-34], it seems that Increase in parity constitute an important risk factor for fetal macrosomia., in his study Civak et al. [36] found that 58% of the mothers delivering macrosomic infants were multiparous, and Berard et al. [37], reported that 78% such mothers were multiparous.

According to "The American College of Obstetricians and gynecologist" (ACOG), the history of macrosomia is the factor that is most related to macrosomia, its positive predictive value is 95%, In our study we found a rate of 14.16% of women who have recently given birth to a macrosomic infant this results is consistent with several other studies [18,20,21], however not all studies have found this relationship [38,39].

Concerning diabetes, we noted that the frequency of diabetic mothers in our series was 1.81%, some studies have reported similar results BISH [29], however other have found a higher percentage for example WARLIN [40] found that diabetes and pre-diabetes are implicated in 10% of cases of macrosomia.

Maternal obesity was the predominant factor in our work for giving birth to a macrosomic infant, the risk of macrosomia was increased fourfold in obese subjects this is similar to what was found by Magnin et al. [30] they reported in their study that 30 to 40% of all children with a birth weight over 4000 g had obese mothers.

The fetal complications were dominated by neonatal infections with a percentage of 88%, followed by fetal trauma with the most common one being shoulder dystocia, those results are way higher than those found by Janela et al. [41].

There were no neonatal mortality in our series, however a lot of other studies have reported some percentage of neonatal mortality of macrosomic infant, Abdallah [42] found a 10% percentage of mortality and Ndiaye et al. [43] found a percentage of 12%, the study of WARLIN [39] found a percentage of 6%, so neonatal mortality is higher in the literature, in fact it is well documented that the more the birth weight increases the higher is the risk for maternal and neonatal morbidity especially over 4500 g, in fact one study [44] have shown that there is a J-shaped birthweight-specific perinatal mortality and morbidity curves, and the 2 important thresholds are: 4500 g and 5000 g this means that over those two thresholds, there is a dramatic increase of complications.

Conclusion

In our study the prevalence of macrosomia was estimated at (10.19%), which is still quite high, and we confirmed some of the risk factors for macrosomia found in the literature which can help to determine the profile of the population at risk: Women aged between 29 and 38 years, multiparous, obese, with fundel height greater than or equal to 34 cm who suffer from diabetes or gestational diabetes and mothers who already given birth to macrosomic baby.

In conclusion, efforts must be made for having a better monitoring of pregnant women to be able to detect patients at risk such as obese mother and those suffering from diabetes in order to improve maternal and fetal prognosis.

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