**Factors allowing delivery of macrosomia by vagina route in N’Djamena Mother and Child University Hospital, Chad**

**Abstract**

**Background:** macrosomia is defined as a fetus weight ≥ 4000g or above 10° percentile. It represents a public health problem related to the occurrence of maternal and fetal morbidity and mortality.

**Objective**: Analyzed factors allowing the delivery of macrosomia by vagina route

**Patients and method:** This was a descriptive-analytical study covering a period of 11 month from January 1st 2024 to November 30th 2024 performed in the maternity of N’djamena Mother and Child University Hospital (NMCUH) about factors allowing delivery of macrosomia by vagina route. All patients consent that delivered macrosomia in NMCUH were included Studied variables were: clinical and prognostic. We used the p-value statistical test to compare the data (significative when ≤ 5%)

**Results:** During the study period, we recorded 81 cases of macrosomia among 3,654 deliveries giving a frequency of 2.2%. Patients with a history of previous macrosomia delivery accounted for 53.1% (p=0.002). Fetus with cephalic presentation predominated with 96.3% (p=0.003), and the pelvis was normal in the majority of cases (80.2%) (p=0.001). The majority of parturient had given birth vaginally (64.2%). Newborns weighted between 4,000-4,500g accounted 75.3% and the Apgar score was 7/10 in 79%. Multiparity was significantly associated with vaginal delivery (p=0.009

**Conclusion:** Delivery of fetal macrosomia is frequent in our context. Multiparity, normal maternal pelvis and fetus with cephalic presentation are factors with a good prognosis for vaginal delivery.

*Keywords: macrosomia, vagina route, mortality, fetal morbidity, NMCUH*

**Introduction**

Fetal macrosomia is defined as a term weight ≥4000g. Compared with the delivery of a normal-weight newborn, maternal and fetal morbidity and mortality are increased in cases of macrosomia [1]. Macrosomia is a public health problem in both developed and developing countries. The prevalence varied according countries. It is approximately 10% of deliveries. In Asia, it ranges from 4.1% depending on the province [2]. In America, great variations are also observed, ranging from 1.7% to 7% [3] The frequency of fetal macrosomia varies around the world. In France, according to the national perinatal survey, the rate of fetal macrosomia was 6.8% in 2016[4] In Africa, studies carried out in Algeria in 2017, Morocco in 2018 and Congo in 2019 reported respectively the prevalences of 6.3% [5], 5.18% [6] and 9.1% [7] respectively.

There are many fetal complications, the most frequent of which is shoulder dystocia, leading to elongation of the brachial plexus and irreversible sequelae secondary to perinatal asphyxia, or even death. Metabolically, neonatal hypoglycemia and hypocalcemia were observed. main maternal complications were: post-partum hemorrhage (atonia or traumatic tears of cervix and vagina [8].

Predisposing factors may be constitutional: maternal obesity, birth weight, racial factors,. They may also be acquired: multiparity, maternal age over 35 years, a history of fetal macrosomia, maternal weight gain, hydramnios and diabetes [8]. Main reported fetal morbidities are: shoulder dystocia, birth traumas, hypoglycemia in neonates, congenital defects, stillbirths, [19-21].

However, it is necessary to try to detect macrosomia during pregnancy, mainly by a simple examination and obstetric ultrasound, aiming to propose better management during delivery. Objective: was to Analyzed factors allowing the delivery of macrosomia by vagina route

**Patients and method**

covering a period of 11 month from January 1 st 2024 to November 30th 2024 performed in the maternity of N’djamena Mother and Child University Hospital (NMCUH) about factors allowing delivery of macrosomia by vagina route. All patients consent that delivered macrosomia in NMCUH

Inclusion criteria were:

* All parturient with a newborn weight ≥4000g (or weight ≥ 10° percentile)
* Consenting parturient.
* Term ≥ 28 weeks of amenorrhea.

Exclusion criteria were:

* patients delivered fetal macrosomia and referred in NMCUH for management of complications
* - patients refused to participate at this study

 Data were collected using a pre-established file. Studied variables were: clinical and prognostic. We used statistical tests such as p-value (p significant if < 5%) to compare data.

**Results and Discussion:**

During this study, we recorded 81 cases of fetal macrosomia among 3654 deliveries, giving a frequency of 2.2%.

Age

Table 1: Distribution of patients according to age

|  |  |  |
| --- | --- | --- |
|  Age | n | % |
| < 20 |  7 |  8.6 |
| 20-29 | 32  |  39.5 |
| 30-35 | 25 |  30.9 |
| > 35 | 17 |  21.0 |
| Total | 81 |  100 |

The age group of 20 to 29 accounted for 39.5%. Mean age was 28.3 ± 2.4 years, with extremes of 17 and 45 years.

**Parity and history of macrosomia**

Multipara represented 76.6% , and patients delivered previously macrosomia accounted for 53.1% (p=0.002).

**Fetal presentation**

Table 2: Distribution of patients according to presentation

|  |  |  |
| --- | --- | --- |
| Presentation  | n | % |
| Cephalic | 78 | 96.3 |
| Front |  1 |  1.2 |
| Face |  1 |  1/2 |
| Transverse |  1 |  1/2 |
| Total | 81 |  100 |

Cephalic presentation accounted for 96.3% (p=0.003)

**Type of pelvis and route of delivery**

The pelvis was normal in the majority of cases (80.2%). (p=0.001)

The majority of parturient delivered by vagina (64.2%).

Episiotomy was performed in 19.8% and 6.2% presented a perineal tear (p=0.2).

**Newborns at birth**

The majority of newborns had had a birth weight between 4000-4500g (75.3%) . Average of birth weight was 4.336g [ 4.000g-5590].

Newborns with Apgar score ≥ 7/10 accounted for 79% at 1 minute and 5 minutes.

**Fetal complications**

Table 3: Distribution of patients according to Fetal complications

|  |  |  |
| --- | --- | --- |
| Fetal complications | n | % |
| Trauma |  3 |  3.7 |
| Hypoglycaemia | 12 |  14.8 |
| Perinatal asphyxia |  8 |  9.9 |
| Brachial plexus elongation |  2 |  2.5 |
| Stillbirth |  9 |  11.1 |
| Haemato-encephalon |  8 |  9.9 |
| None |  39 |  48.1 |
| Total |  81 | 100 |

Hypoglycemia was the most common fetal complication, accounting for 14.8%.

**Maternal complications**

**Post partum hemorrhage accounted for 8.6% (p=0.001)**

**Correlation between vaginal delivery and parity**

Table 4: Correlation between vaginal delivery and parity

|  |  |  |
| --- | --- | --- |
| Vagina delivery | parity | Total |
| primipara | multipara |
|  | No | n | 12 | 17 | 29 |
| %  | 14.8 | 21 | 35.8 |
| Manoeuvre | n |  4 |  8 | 12 |
| %  |  4.9 |  9.9 | 14.8 |
| Dystocie des épaules | n | - |  3 |  3 |
| %  | - |  3.7 |  3.7 |
| Expulsion spontanée | n |  3 | 34 | 37 |
| % |  3.7 | 42 | 45.7 |
|  Total | n |  19 |  62 | 81 |
| %  |  23.5 | 76.5 | 100 |

p=0.009. Multiparity is significantly associated with vaginal delivery.

 **Correlation between newborn weight and caesarean section**

Table: 5: Correlation between newborn weight and caesarean section

|  |  |  |
| --- | --- | --- |
| Caesarean section done at the first stage of delivery | Newborn weight | Total |
| 4,000-4,500g | 4500-5000g | plus de 5,000g |
|  | Non | n | 40 | 12 | 2 | 54 |
| %  | 49.4 | 14.8 | 2.5 | 66.7 |
| Oui | n | 21 |  5 | 1 | 27 |
| %  | 25.9 |  6.2 | 1.2 | 33.3 |
| Total | n | 61 | 17 | 3 | 81 |
| %  | 75.3 | 21 | 3.7 | 100 |

p=0.92. In 49.4% of the delivery was by vagina for newborns weighing between 4,000 and 4,500g

**Correlation between caesarean section and parity**

Table: 6: Correlation between caesarean section and parity

|  |  |  |
| --- | --- | --- |
| Caesarean section at the first stage of delivery | Parity | Total |
| primipara | multipara |
|  | Non | n | 7 | 47 | 54 |
| %  | 8.6 | 58 | 66.7 |
| Oui | n | 12 | 15 | 27 |
| %  | 14.8 | 18.5 | 33.3 |
| Total | n | 19 | 62 | 81 |
| %  | 23.5 | 76.5 | 100 |

p=0.002

Multipara had delivered by vagina in 58%.

During this study, we recorded 81 cases of fetal macrosomia among 3,654 deliveries giving a frequency of 2.2%.This rated can be explain by factors like patients’ morphology and the pregnancy history. The occurrence of some pathologies like diabetes can lead to macrosomia.

According to the age, we noted that the age group of 20-29 was the most represented at 39.5%. The average age was 28.3 ± 2.4 years. Other authors such as Ndiaye in Senegal [10] and Bitwe [7] in DRC reported a similar average age of 28 and 29 respectively. This result confirmed that age is important in the macrosomia genesis.

Concerning clinical aspects, we reported that multipara is classically considered to be a factor favoring the occurrence of fetal macrosomia [7,9]. This study confirms this finding, with 76.6% of multipara women. This result differs from that of Li [2] which reported a proportion of multipara of 12.71%. Our result is similar to the literature data which shows that multiparity multiplies by 2 the relative risk of the occurrence of fetal macrosomia [2,7,10,11].

In terms of delivery mode, 64,2%% of babies were delivered vaginally compared with 35.8% by caesarean section. This predominance of vaginal delivery is reported by all authors in the literature [7,8,10,12]

 Fetal macrosomia is a risk factor for neonatal morbidity linked to the mechanical problems of delivery to which fetal macrosomia is exposed [13]. In this study, the majority of newborns had had a birth weight between 4000-4500g (75.3%) and the average weight of the newborns was 4,336g, with extremes of 4,000 and 5,590g. This high risk of delivery exposes the mother to perineal tears, justifying preventive episiotomy. With regard to maternal complications, in this series we observed an episiotomy rate of 6.2%. This high risk of episiotomy was even greater when the weight reached or exceeded 4250g. The second reason is that episiotomy is a procedure performed to prevent perineal tears. Indeed, in the presence of a narrow perineum, the only way to avoid perineal tears is to systematically perform an episiotomy.

According to maternal complications, we noted in this study that 8.6% of patients had presented postpartum hemorrhage. This could be explained on the one hand by the uterine distension caused by macrosomia, and on the other hand by the lack of follow-up during the pregnancies. No maternal deaths related to macrosomia were recorded during the study period.

 As regards the condition of the newborns, we recorded a rate of 79% of newborns with an APGAR > 7/10 at 1 minute and 5 minutes. According to data [14-18] macrosomia is a factor that increases neonatal morbidity. Main morbidity reported in this study were; can be hypoglycemia, stillbirths and perinatal asphyxia which represented respectively 14.8% series, 11.1% and 9.9%. In another area, N’Diaye [10] noted 12% of perinatal asphyxia. This neonatal mortality seems to be linked either to poor monitoring of high-risk pregnancies, such as diabetic pregnancies, or to delays in evacuation from peripheral health facilities.

In studying the relationship between parity and mode of delivery, we found that most multiparous women (58%) had vaginal deliveries. These results are similar to those reported by Bitwe [7] and Fatnassi [8], who found a high rate of vaginal delivery in multiparous women. These results could be explained by the fact that multiparous women have delivered many times and their pelvis can allow the delivery of fetal macrosomia. Comparing the correlation between fetal weight and delivery, we noted a p= 0.92. This can be explained by the fact that the determining allowing the delivery of macrosomia by vagina route is maternal pelvis and parity. Then patients with a good pelvis and with a previous history of fetal macrosomia can deliver easily babies weighing ≥4000g.

**Conclusion**

Fetal macrosomia delivery is frequent in our context. Vagina delivery remains possible even if there is the possibility of the occurrence of maternal and fetal morbidity and mortality. Multipara, normal pelvic measure and cephalic fetus presentation seem to be factor allowing the vagina delivery;

**Consent**

As per international standards or university standards, Participants’ written consent has been collected and preserved by the author(s).

**Disclaimer (Artificial intelligence)**

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**COMPETING INTERESTS DISCLAIMER:**

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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