Devenir respiratoire des nouveau-nés nés par césarienne élective

piratory outcome in neonates born by elective cesarean section

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RESUME :

L'incidence des césariennes électives est en hausse ces dernières années. Une augmentation parallèle de la morbidité respiratoire chez le nouveau-né à terme est constatée.

Objectifs : L'objectif de notre travail est d'évaluer le risque de la détresse respiratoire néonatale dans les césariennes électives au centre de maternité de Bizerta.

Patients et méthodes : Notre étude est rétrospective analytique type cas-témoins réalisée à la maternité de l'hôpital régional de Bizerta du 1er janvier 2009 au 31 décembre 2010. Pour le groupe des cas, nous avons inclus toutes les naissances vivantes nées par césarienne électives. Pour le groupe des témoins, nous avons considéré pour chaque nouveau-né du groupe des cas, le nouveau-né né immédiatement après par voie basse à un terme entre 37 et 41 semaines d'aménorrhée (SA) + 6j.

Résultats : Pendant la période d'étude, 300 nouveau-nés sont nés par césarienne élective. La fréquence des naissances par césarienne élective est de 4,3% des naissances totales et de 14,3% des naissances par césarienne. L'indication principale des césariennes électives était l'utérus multicicatriciel (30%). La césarienne élective est réalisée à un terme moyen de 39 SA. La fréquence de la morbidité respiratoire était de 11% dans le groupe des cas versus 2% dans le groupe des témoins, ainsi la césarienne élective expose à un risque de morbidité respiratoire avec un OR=6,05 IC 95% [2,78-16,87];P<10-3. La principale étiologie de la morbidité respiratoire dans le groupe des cas est la tachypnée transitoire du nouveau-né. Après le terme de 39SA, la fréquence de la morbidité respiratoire dans le groupe des cas diminue de façon statistiquement significative (2% VS 19%) ; OR=11,53 ;IC 95% [4,23-30,1] ;P<0,01 et elle est statistiquement comparable à celle du groupe de témoin ayant le même âge gestationnel (2%VS 1,7%),OR=1,24 ;IC 95% [0,24-6,26] ;P=0,2. Ainsi après 39SA, la césarienne élective n'expose pas particulièrement le nouveau-né à un risque de morbidité respiratoire.

Conclusion : L'indication de césarienne élective doit être strictement basée sur des décisions médicales et obstétricales car elle prédispose à un risque statistiquement significatif de détresse respiratoire néonatale. Quand la césarienne élective s'impose, elle doit être programmée après 39 SA.

ABSTRACT:

Elective caesarean section effect is increasing in recent years.A parallel increase of respiratory morbidity in term infants is found.

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Objectives : We aims to evaluate the risk of the neonatal respiratory morbidity in elective ceasarien section in Bizerta maternity center

Population and Methods : This is an analytical and retrospective case-control study, achieved at the Regional Maternity Hospital of Bizerta from 1st January2009 to 31 December 2010.
For the case group, we included all live births born by ECS. For the control group, we considered for each newborn case the newborn birth vaginally immediately after at term between 37and 41+6 weeks of gestation (WG).

Results : During the study period, 300 newborns were born by ECS. The frequency of elective caesarean births is 4.3% of total births, and 14.3% of births by cesarean section. The main indication was previous caesarean delivery (30%).ECS is performed at a mean of 39 WG. The frequency of respiratory morbidity is 11% in the case group versus 2% in the control group, so ECS exposes for a higher risk of respiratory morbidity with an OR = 6.05; 95%IC [2.78-16.87], P<10-3. The main etiology of respiratory morbidity in the group of cases is transient tachypnea (10%). After 39 WG, the frequency of respiratory morbidity in the case group decreased statistically significantly (2% versus19%), OR = 11.53; 95%CI [4.23-30.1], P <0.01 and is comparable to the control group with the same gestational age (2% versus1.7%), OR = 1.24; 95%CI [0.24-6.26];p=0,2. So after 39 WG, elective caesarean doesn't expose the newborn to a particular risk of respiratory morbidity.

Conclusion : ECS should be based strictly on obstetrical and medical decisions because it predisposes to a significant risk of neonatal respiratory morbidity. When thecaesarean is necessary, it must be programmed after 39 WG.

Mots clés : Césarienne élective- nouveau né-morbidité respiratoire-âge gestationnel- étude type cas- témoins

Keywords : Elective caesarean section-Newborn-Respiratory morbidity-Gestational age-Case/control study

INTRODUCTION

An increased rate of cesarean birth and especially of elective cesarean is observed in recent years (1,2). At the same time, neonatal respiratory diseases, especially hyaline membrane disease and transient tachypnea have seen their incidence increase in the term newborn (3). This increasing respiratory morbidity results in a more frequent stay in intensive care with use of invasive diagnostic and therapeutic procedures.

The objective of this study was :

1/ to assess the risk of neonatal respiratory morbidity in neonates delivered by elective caesarean section versus neonates born vaginally

PATIENTS AND METHODS

We conducted a retrospective case-control study in the maternity center of Bizerta .

The cases : live births born by elective caesarean section during 2 years (january 2009-december 2010).

The controls : live births born vaginally to a term between 37 and 41 week of amenorrhea+ 6 days drawn from the register of births in the delivery room: for every newborn in the group of cases, we considered the new baby born immediately after We did not included newborns if the mother has a previous pregnancy pathology (diabetes, heart disease, nephropathy ...), if pregnancy was complicated by gestational pathology or fetal distress, if the term of pregnancy was imprecise,if they were affected by major congenital anomalies or if they had cardiac ,metabolic, infectious, neurological or muscular respiratory morbidity.

We collected :

* Data on the mother (age, gravidity, parity)
* data on the monitoring of pregnancy (date of last menstrual period, number, dates and results of consultations and ultrasounds)
* data on caesarean section (term, indication,mode anesthesia, duration of intervention)
* data on newborn (Apgar score, trophicity, morphological maturity)
* data on respiratory morbidity (cause, Severity, treatment, evolution)
* Data relating to other diseases possibly associated

All data were entered and analyzed by EXCEL using SPSS software version 11.5. For qualitative variables, we calculated simple frequencies and relative frequencies. For quantitative variables, we calculated averages and standard deviations. To identify risk factors directly related to the event we performed a multivariate logistic regression analysis. In all statistical tests, the significance level was set at 0.05.

RESULTS

During the study period, 300 newborns were born by elective caesarean representing 4.3% of total births and 14.3% of all caesarean births. Indications of elective caesarean are shown in order of decreasing frequency in Table 1.

Table I : Distribution of births according to obstetric indications

Indications	%
Multi-scarred uterus	30%
pathological basin	19,3%
macrosomia	14,6%
precious pregnancy	12,3%
Single uterine scar	9,3%
Twins	6%
primipara with breech presentation	3%
high myopia	1%
vaginismus	1%
uterine scar corporeal	0,7%
genital warts	0,7%
symptomatic disc herniation	0,7%
fibroma praevia	0,7%
Bilateral congenital hip dislocation	0,3%
Complete vaginal septum	0,3%

Elective caesarean sections were performed at a mean gestational age of 39 weeks and under general anesthesia in 92,6% of cases (278 cases) (fig1).

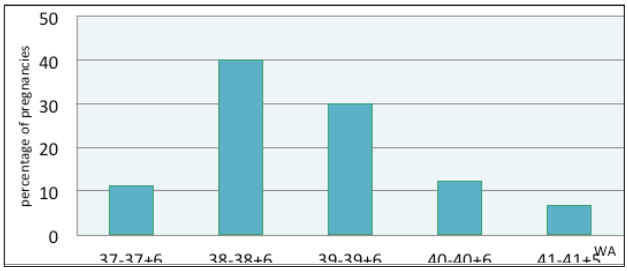

FIGURE 1 : Distribution of births by term pregnant

The average age of mothers was 32.6 years. They were primiparous in 23% of cases. Pregnancy was correctly followed in 94% of cases (282 cases). It was twins in 6% of cases (9 cases). newborns were male in 57.7% of case (173 boy). The average weight at birth was 3497gramme. The frequency of respiratory morbidity in the group of cases was 11% (33 cases).This frequency was significantly higher in cases born before 39 weeks of gestation (19%) compared to cases born after (2%): OR = 11.53, CI 95% [4,23-30,1],P<0,001 (table2).

Table II : assessing the risk of respiratory morbidity according to the term of elective cesarean

Term	DRNN+	DRNN-	Total	OR	P
37SA - 38SA+6J	30	124	154	11,53 IC 95%[4,23-30,1]	P<10-3
≥39SA	3	143	146		
Total	33	267	300		

Etiologies of respiratory morbidity were distributed as follows: transient tachypnea (30 cases), hyaline membrane disease (HMD) (2 cases), arterial persistent pulmonary hypertention (1 case). The mean duration of hospitalization was 3.91 days . One patient had developped at the fourth day of hospitalisation a nosocomial infection having evolved well under appropriate antibiotic therapy.
Respiratory distress was severe in 3 cases (Silverman score ≥ 4). Two of them were transferred to a neonatal intensive care unit and required mechanical ventilation for 72 hours with a good evolution. The third died after 24 hours of his birth by HMD. His transfer to a neonatal intensive care unit was not possible due to lack of places. Table 3 indicates general features of both study groups.

Table III : general characteristics of the two study populations

Variables	Cases	Controles	P
Average maternal age	32,6ans	29 ans	p=0,09
average parity	2,4	2,1	p=0,2
Average number of visits	7,3	6,9	p=0,55
Average number of ultrasounds	5,24	5,16	p=0,6
Sex	57,7%	55%	p=0,45
Birth weight	3497g	3464,3g	p=0,18

The frequency of respiratory distress was 2% in controles group (OR=6,05, CI 95% [2,78-16,87],P<10-3) thus the risk of respiratory disease is 6 times higher in newborns born by elective cesarean (table4).

Table IV : Comparison of respiratory morbidity in both groups

	Cas	Témoins	OR	P
DRNN+	33	6	6,05[2,78-16,87]	p<10-3
DRNN-	267	294		

Comparing the frequency of respiratory morbidity between the two groups according to gestational age (before or after 39 weeks gestation) shows that after 39 weeks of gestation elective caesarean not particularly exposes the newborn to risk of respiratory morbidity (table5).

Table V : study of respiratory morbidity in both groups per gestational age

Term	Cases		Controls		OR	P
	DRNN+	DRNN-	DRNN+	DRNN-		
37 GW-38 GW+6d	30	124	3	116	9,35[1,19-17,22]	p<10-3
≥39GW	3	143	3	178	1,24[0,24-6,26]	0,2

in contrast, infants born by elective cesarean section before this term have a greater (OR = 9.35) risk of developing respiratory distress compared with those born vaginally.

Multivariate analysis by logistic regression allowed to retain elective caesarean and gestational age before 39 weeks of gestation as risk factors for neonatal respiratory morbidity (table 6):

Table VI : Multivariate logistic regression

Variables	P	ORa	IC95%
Term<39SA	0,00	6,58	[2,7-15,49]
Term≥39SA	0,12	1,4	[0,82-7,54]
Cesarean delivery	0,001	5,01	[1,8-13,5]
birth weight	0,19	1,9	[0,74-9,3]
Maternal age	0,9	1,2	[0,1-11,4]
sex	0,09	0,79	[0,4-1,5]
parity	0,85	1,7	[0,57-2,4]

* The elective caesarean birth increases the risk of neonatal respiratory distress any gestational age confused (11% vs 2%, p = 0.001)
* After 39 weeks of gestation, elective caesarean birth does not increase the risk of neonatal respiratory distress (80.5% vs 98%, p = 0.12)

DISCUSSION

The frequency of elective caesarean was 4.3% of total births and 14.3% of births by caesarean section.Ben Hamida found in his study a frequency of 3.6% relative to all births (4). highest rates are found in developed countries. They range from 7% to 26% of births in different series (5,6, 7, 8, 2, 9,10). Several factors are responsible for increasing the rate of births by elective cesarean section: The increase in the average age of parturients and in multiple pregnancies(5,11),the attitude "has one section, always a section" (12,13,14),the request of the mother without medical or obstetric indication (15,16,17). In our study, the two main indications for elective cesarean section were multicicatriciel the uterus (30%) and pathological obstetrical pelvis (19.3%). No cesarean section was performed at the request of the mother.

We found that the frequency of respiratory morbidity in neonates born by elective cesarean section was 11%.This rate is higher than that found in a similar Tunisian study which found a rate of 6% (1). The Danish study of Borgwardt and al [8], conducted over 3 years, found that 21 newborns among 494 elective cesarean births have developed a respiratory distress with a rate of 4.25%.In the study of Zanardo et al. [18], respiratory morbidity is 3.2% among newborns from elective cesarean.

Transient tachypnea is the most common cause of respiratory morbidity in neonates born by elective cesarean in our series.This result is consistent with the literature data [19,4,20,18,21]. In our series we had two cases of HMD with a rate of 0.7%. Ben Hamida [1]noted no cases of HMD. According Zanardo[18] , the risk of developing a HMD is 6 times higher in neonates born by elective cesarean. Studies conducted by Parilla [22], Madar [23]and Gouyon [5] also found a significant risk of HMD. This risk is attributed to iatrogenic prematurity. Pulmonary arterial hypertension, found in one case in our results was 5 times more common in neonates born by elective cesarean section in the series of Levine (24). neonatal mortality caused by distress respiratory was null in most series [4,18,10]. We recorded one case of death.

A higher incidence of respiratory distress in newborns from elective cesarean compared to those from vaginal delivery is reported in the literature (4,18,9,8). Our findings are thus consistent with the literature data. Indeed, in our study the risk of developing a respiratory distress among newborns from elective cesarean is 6 times more than those born vaginally. British and american societies in obstetrics recommend elective caesarean section to be scheduled after 39 weeks of gestation (25). In addition several observational and cohort studies showed a decreasing of risk of respiratory morbidity after 39 weeks of gestation [4,26,10,27,28].

Glavind and all[29] conducted a randomised controlled trial of neonatal and maternal morbidity after elective cesarean section scheduled at 38+3 weeks compared with 39+3 weeks of gestation. They conclude that elective caesarean section scheduled after 39weeks carried a similar risk of neonatal special care admission.When our study was initiated a substantial number of elective caesarean section in Bizerta maternity center were scheduled before 39 weeks of gestation. We found that the risk of developing respiratory distress is 9 times higher in neonates born by elective cesarean section compared with those born vaginally when the cesarean is scheduled before 39 weeks of gestation and that this risk is no longer significant after this term.

CONCLUSION

In our study, the indications for elective cesarean section were exclusively medical or obstetric. Elective caesarean section exposes the newborn to a significant risk of respiratory distress if it is scheduled before end of 39 WG.

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