Research Article

Risk Factors of Birth Trauma of New Born Babies in Baghdad Teaching Hospital

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Date Submitted:
Date Accepted:

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Abstract

***Background*: Birth trauma is defined as injury to infant resulting from mechanical forces (such as compression or traction) during the process of birth .**

Objectives of the study:

1. To highlight the risk factors that may contribute to birth trauma.

2. To identify the common types of birth trauma in the obstetric units.

***Patients & Methods:* During 6 months period a cross sectional study was conducted on 200 babies (100 babies delivered with birth trauma and 100 babies delivered without birth trauma for the control group) in Baghdad Teaching Hospital**

***Results:* Trauma of the cranium was the most common type. There is a significant association between birth trauma and birth weight , gestational age, multiple gestations , prolonged labor , babies from mothers who are primigravida , diabetic or having contracted pelvis .**

Key words:

INTRODUCTION

Birth trauma: Injuries to the infant that result from mechanical forces such as (compression, traction) during the birth process are categorized as birth trauma [(1)].

Significant birth injury accounts for fewer than 2% of neonatal deaths and stillbirths [(2)]. It still occurs occasionally and unavoidably, with an average of 6-8 injuries per 1000 live births [(3)] . In general, larger infants are more susceptible to birth trauma[(1)]. Higher rates are reported for infants who weigh more than 4.5kg [(1)].

Most birth traumas are self-limiting and have a favorable outcome. Nearly one half are potentially avoidable with recognition and anticipation of obstetric risk factors. Infant outcome is the product of multiple factors (4) .

Mortality/morbidity: From 1970-1985, rates of infant mortality due to birth trauma fell from 64.2 to 7.5 deaths per 100,000 live births, a remarkable decline of 88%. This decrease reflects, in part, the technologic advancements that allow today's obstetrician to recognize birth trauma risk factors using ultrasonography and fetal monitoring prior to attempting vaginal delivery. The use of potentially injurious instrumentation, such as midforceps rotation and vacuum delivery, has also declined. The accepted alternative is a cesarean delivery [(1)].

Factors predisposing to injury include the following:

- Cephalopelvic disproportion, maternal pelvic anomalies.
- Prolonged or rapid labor.
- Deep transverse arrest of descent of presenting part of the fetus.
- Abnormal presentation (breech, face).
- Use of midcavity forceps or vacuum extraction.
- Versions and tractions.
- Fetal macrosomia.
- Fetal prematurity.
- Maternal illness (hypertension and diabetes).
- Primiparous mother
- Maternal age during labor (too young or too old mothers).
- Fetal anomaly
- .Member of twin [(5)].

The birth process is a blend of compression, contractions, torques, and traction. When fetal size,

presentation, or neurologic immaturity complicates this event, such intrapartum forces may lead to tissue damage, edema, hemorrhages, or fractures in the neonate. The use of obstetric instrumentation may further amplify the effects of such forces or may induce injury alone. Under certain conditions, cesarean delivery can be an acceptable alternative but does not guarantee an injury-free birth (6).

AIMS OF THE STUDY

1. To highlight the risk factors that may contribute to birth trauma.
2. To identify the common types of birth trauma in the obstetric units.

PATIENTS AND METHODS

A case control study was done on 200 babies (100 babies delivered with birth trauma and 100 babies delivered without birth trauma as control group) in Baghdad Teaching Hospital,during a period of six months extended between 15th of December 2011 to the 15th of June 2012 to look into the risk factors, types of the birth trauma in the new born babies . Data collecting was done through physical examination of both mothers and babies and taking history from mothers and from doctors who managing the case and the control .The cases include any newborn with birth truma . Investigations which were done to the cases according to the type of birth trauma including the following:

- Skull x-ray.
- X-ray of the extremities.
- Cerebral Ultrasonography
- CT scan of the brain.

The control group include babies who were admitted to Neonatal Intensive

Care Unit and obstetric ward of the same hospital for other than birth trauma.

Statistical analysis: Statistical package for social sciences [SPSS] version 18 was used for input and data analysis. Chi-square was used for comparison among categorical variables for frequencies and percentages .In all statistical analysis, level of significance ($p<0.05$) was considered . Finally all data and results had been presented in tables and figures.

RESULTS

From our study we found the following results :

Genders was not statistically significant as a risk factor for birth trauma (P=0.8), as shown in table (1) there is a statistical significant association between birth trauma and birth weight , gestational age and multiple gestations as shown in Table (2) ,(3) ,(4) resprctively .

The influence of maternal risk factors on birth trauma was studied in details,

Maternal *age*:Is not significantly reflected on babies who had birth trauma (p=0.16), as shown in table (5) .
Regarding parity ;it was found that there is astatistical significant association between birth trauma and babies from mothers who are primigravida (p=0.002 ,table5).
There is no significant association between maternal hypertention and the occurrence
of birth trauma (p=0.45 ,table5).On the other hand maternal diabetes mellitus has significant effect on birth trauma(p=0.027 ,table 5) .Also there is statistical significant association between birth trauma and babies who born to mothers having a contracted pelvis (p=0.003,table 5)

The influence of labor risk factors on birth trauma :

There is a significant statistical association between birth trauma and normal vaginal delivery , prolonged labor in both primi and multi mothers , fetal presentations sholder dystocia ,(p=0.0008, p=0.0005 ,p=0,001, p=0.03 respectivly ,table 6) .

Trauma of the cranium was the most common type [caput succedaneum (82%), followed by cephalhematoma (6%), erythema-abrasions-ecchymosis of the head and neck (4 %), Subconjunctival hemorrhage (3 %) , scalp wounds and lacerations (3 %)] ,Fracture of femur (1%) and Erb's palsy (1%) (figure 1) .

Investigations with findings:-

X-ray to the extremities shows fracture femur in one case.

X-ray of skull for cephalhematoma in 6 cases was normal.

Ultrasound of the brain in 6 cases of cephalhematoma was normal.

Table 1. Gender difference for the case and control groups.

Gender	Case group	Control group	P value
Male	57	56	P=0.8
Female	43	44	
Total	100	100	

Table 2. The relation between birth weights of the case and control groups.

Birth weight/kg	Case group	Control group	P value
< 2.5 kg	15	11	
2.5 – 4 kg	73	87	
> 4 kg	12	2	P = 0.03
Total	100	100	

Table 3. The relation between gestational age of the case and the control groups.

Gestationa	Case	Control	P value

l age in weeks	group	group	
< 37 week	25	13	P = 0.029
≥ 37 week	75	87	
Total	100	100	

Table 4. Distribution of the study sample according to being singlton or multiple gestations.

Number of gestation	Case group	Control group	P value
Singlton	87	95	
Member of twin	13	5	P=0.045
Total	100	100	

Table 5. Maternal risk factors

Maternal risk factors	Category	Case group	Control group	P value
Mother age in years	<16 year	0	2	P = 0.16
	16 – 35 year	95	90	
	>35 year	5	8	
Parity	Primi	52	30	P = 0.002
	Multi	48	70	
hypertension	Yes	7	11	P =0.45
	No	93	89	
Diabetes mellitus	Yes	11	3	P = 0.027
	No	89	97	
contracted pelvis	Yes	16	3	P = 0.003
	No	84	97	

Table 6. The influence of labor risk factors on birth trauma.

Labor risk factors	Category		Case group	Control group	P value
Type of delivery	NVD		70	32	P = 0.0008
	CS		30	68	
Total of NVD			100	100	
Duration of second stage of labor in hours	Multi	<1/2	15	21	P=0.0005 P=0.0005
		≥1/2	18	0	
	Primi	<1	12	11	
		≥1	25	0	
Total of NVD			70	32	
Fetal presentation at labor	Cephalic		51	30	P=0.001
	Breech		14	2	
	Face		5	0	
Total			70	32	
Shoulder dystocia at labor	Yes		6	0	P =0.03
	No		64	32	
Total of NVD			70	32	

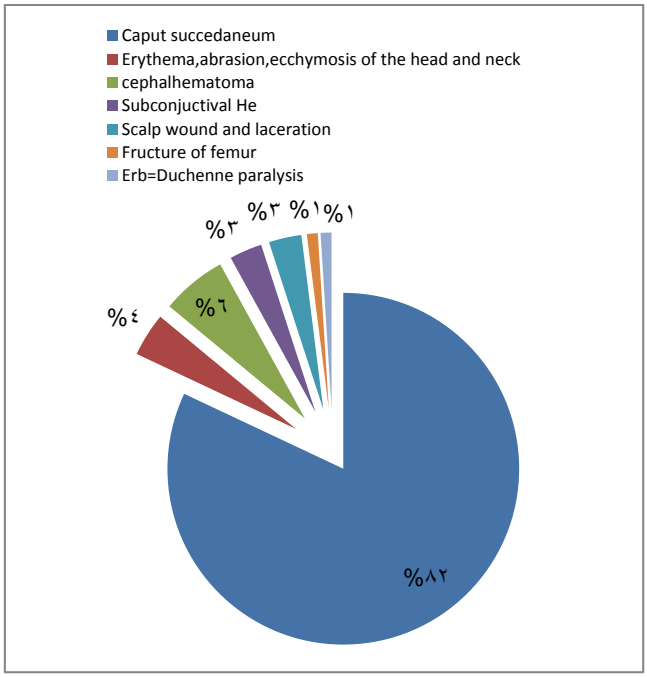

Figure 1. Types of birth trauma and their percentages.

DISCUSSION

Birth trauma is estimated to be between the sixth to tenth leading cause of infants' mortality in the U.S.A .It is under reported and often misdiagnosed [2].

This study, shows that males (57%) were more often affected by birth trauma than females (43%), but the difference was not significant (p=0.8).

Regarding birth weight, this study shows its significant influence in the occurrence of birth trauma, especially those babies with birth weight more than 4kg (p=0.03), which is consistent with others, Ghorashi,et.al[7], Abdulbari et .al [8] Kliegman R.M. in [3], Borna .et al [9] Numan N. [10]

The typical risk factors for traumatic birth injury include premature babies born before 37 week Jesse Reiters(11); This study shows that there is statistical significant difference between the study groups regarding gestational age in weeks and birth trauma (p= 0.029), similar to that found by Numan N[10]. Borna. et.al [9]

In multiple gestations there is statistical significant difference between the two groups regarding multiple gestation and birth trauma in this study, (p = 0.045), which is consistant with McIntosh N [12], Numan N.[10] This could be due to decrease in the available fetal movable space, which increase the likelihood of malpresentation [13].

Maternal age, showed no significant effect on occurrence of birth trauma (p=0.16), similar to that found by Sameera T[14] , Numan N .[10]. Elizabeth.D, et.al [15].

Being Primigravida has significant effect on occurrence of Birth trauma.(p = 0.002) ,which is consistant with the result reported by Numan N. [10]

Regarding chronic illness of the mother, hypertension showed no significant effect on the occurrence of the birth trauma, (P=0.45).

It has been reported that gestational Diabetis mellitus affects 1%–14% of all pregnancies, and that its incidence has been steadily rising[16]. In this study Diabetes mellitus has significant effect on the occurrence of birth trauma(p = 0.027) , this may be related to the poor control of our diabetic patients which results in delivery of a large for gestational age babies (macrosomia) and traumatic birth injury (e.g. brachial plexus injury and shoulder dystocia), similar to Abdulbari et.al [8] .

There is statistical significant difference between two groups regarding maternal pelvic abnormality and birth trauma , (p =0.002), as maternal pelvis size and type will have an effect on the birth canal size and shape and the forces encountered on the emerging head and spine and this is similar to the result reported by Sameera T[14] , Numan N[10] .

This study showed that birth trauma is significantly associated with normal vaginal delivery (p= 0.0008) . Although no reported case of forceps or vacuum delivery in this study but it could be due to prolonged second stage of labor labor , this result is similar to that reported by Seyed .et.al[17] and Charusheela W.et.al [18]. In this study, prolonged second stage of labor, significantly associated with birth trauma (p =0.0005).

Abnormal fetal presentation at labor (like breech or face presentation) significantly associated with birth trauma as found by this study (p=0.001). This is similar to what was found by Numan N. 2008 [10].This can be explained by that abnormal fetal presentation will prolong the second stage of labor [6].

The presence of shoulder dystocia at labor increase the occurrence of birth trauma [19]. The incidence of shoulder dystocia at labor in this study was (6%), and its significantly associated with birth trauma (p =0.03) which is similar to the finding of Sameera. T[14] , Numan N.[10]

Regarding the types of birth trauma, this study showed that trauma of the head is the most common type (98%), of which caput succedaneum (82%),cephalhematoma 6%, erythema and or abrasion 4%, Subconjunctival hemorrhage 3% and scalp wound 3%. These results `agree with Sameera T(14) , Numan . N [10].

This study showed that there was one case of fracture femur (1%) , this percentage is nearly similar to what was reported by Charusheela W.et al (18), Sameera T[14] and Numan N[10].

Peripheral nerves injuries (1%) were less common than trauma to the cranium as found by this study, which is similar to Elizabeth, et.al [15], Ghorashi,et.al [7], and differ from Rosenberg A.A. in 2001[13], who conclude that most common birth trauma are soft tissue bruising, fractures (clavicle, humerus, or femur) and cervical plexus palsies.

CONCLUSIONS:

Birth trauma is still a significant problem in the maternity ward causing some morbidity.

The most common type of birth trauma was the trauma of cranium of which caput succedaneum was the most common type.

Most common neonatal risk factors that increase the incidence of birth trauma were macrosomia, prematurity and multiple pregnancies. Regarding the maternal side, we have the primigravida, chronic maternal illness like diabetes mellitus, pelvic anomalies or contracted pelvis. Risk factors related to labor were prolonged labor especially the second stage, abnormal fetal presentation and shoulder dystocia.

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