NEONATAL CONVULSION[+]

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Abstract

Objective:

This study was done to investigate the etiology of neonatal convulsion and the mortality according to the etiology .

Aim : To identify the most important etiological factors of neonatal convulsion so we can plan a strategy for preventing the causative factors and treating them early.

Patients and method :

65 neonate with convulsion was studied over two years period all was investigated by doing blood sugar , serum ca ,serum electrolyte ,blood culture and lumber puncture, other investigation were done when indicated .

Result:

The most common cause of neonatal convulsion is hypoxic ischemic encephalopathy (53%) and most of the cases occur within the first 48 hrs , the second most common cause was infection (15%), followed by metabolic causes (10%) , and intracranial hemorrhage (6%) .

The highest mortality rate is between those with congenital abnormalities (100%) and infection (50%).

Recommendations:

We recommend highly specialized training program for both obstetricians and pediatricians to decrease the incidence of neonatal convulsion and improve their outcome

المستخلص :

الخلفية :

هذة الدراسة اهتمت باسباب الصرع عند حديثي الولادة ومعرفة نسبة الوفيات حسب السبب .

الهدف:

معرفة الاسباب الرئيسية للصرع عند حديثي الولادة ووضع خطة لعلاجها .

الطريقة :

تم دراسة ٦٥ طفل من حديثي الولادة الذين ادخلوا الى المستشفى بسبب اصابتهم بنوبات الصرع . اجريت لهم فحوصات مختلفة تشتمل نسبة السكر في الدم ونسبة الكالسيوم والاملاح في مصل الدم ، زرع الـــدم ، وفحص السائل الشوكي ، فحوصات اخرى اجريت في بعض الحالات فقط .

النتيجة:

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اهم الاسباب كان نقص وصول الدم الى الدماغ (٥٣%) واكثر الحالات ظهرت في ال٤٨ ساعة الاولى من العمر . اما الاسباب الاخرى فهي الالتهابات الجرثومية (١٥%) ،الاختلاجات الايضية (١٠%)،النزف داخل الدماغ (٦%)، حسب الترتيب.

اعلا نسبة وفيات كانت بين المرضى الذين ولدوا مع تشوهات خلقية (١٠٠ %) ثم بين الذين لديهم التهابات جرثومية (٥٠ %) .

التوصيات:

نقترح عمل برنامج تخصصي لتدريب اطباء الاطفال والنسائية لتقليل نسبة المصابين بالصرع الولادي وتحسين نتائج العلاج .

Introduction:

Convulsions in the newborn is a significant problem ,the reported incidence varies in different parts of the world ranging from 1.5-14/1000 live birth.[1,2,3]
The etiology varies ,it shows a changing pattern over the past 30 years. The most earlier reports suggest that birth trauma and hypoxia were the most common causes ,[4,5,6] while later studies showed the importance of metabolic disturbances particularly hypocalcemia,[7] however more recent reports showed a decline in the incidence of hypocalcemia and perinatal asphexia appeared to be the most important factor in the etiology.[8,9]

To decrease the morbidity and mortality associated with this condition,we have to know the various etiological factors.

Aim:

This study was designed to investigate the etiology of neonatal convulsions and the mortality according to the etiology ,so that we can plan strategies for preventing or alleviating the causative events.

Patients and methods:

The study was done on 65 neonates with neonatal convulsion who were seen in Iben-Gaswan teaching hospital during two years period (from 1st October 1998- to 30 September 2000).The neonates who were included were those born in the hospital and admitted to the neonatal care unit and newborns with convulsion admitted to the pediatric ward.

Five of those patients were preterm , five were small for gestational age and 55 were full term,gestational age was calculated on the bases of external and neurological criteria as described by Dubowitz.[10]

Initial investigations included blood sugar , serum ca , electrolyte , blood culture and lumber puncture ,these were done in all of the cases ,other investigations as screening for congenital infections ,serum and urine chromatography ,skull X – Ray and brain scan were done when indicated.

Results:

65 newborn with convulsion were studied ,5 were preterm ,5 small for gestational age and 55 were full term ,their age range from 1 hr-28 days.

Hypoxic – ischemic encephalopathy was diagnosed in 34 newborn (53%),all were full term .

There were 10 patients with infection (15%),7 had bacterial meningitis and 3 with septicemia.

Hypoglycemia was considered the main cause of convulsion in 6 patients.Hypocalcemia was the cause of convulsion in one newborn after exchange transfusion was done ,so metabolic causes represent 10% .

Intracranial hemorrhage due to birth trauma occurred in 4 newborns (6%),in all there was a history of traumatic delivery ,hemorrhagic cerebrospinal fluid and radiological evidence of skull fracture.

The two newborn patients with congenital abnormalities (3%) included one with hydrocephalus and one with ventricular septal defect and heart failure who developed convulsion at the age of fifteen days and died shortly later , in 8 cases (13%) the underling cause was unknown . All these results shown in table 1.

The age of onset of convulsion ranged from 3 hr to 28 days ,27% of them began within the first 24 hr of life, The incidence related to age of onset is detailed in figure 1.This shows that most of hypoxic-ischemic causes presented during the first 2 days ,the mean age of onset was 18.5 hrs.

Relatively few newborns presented after the firs week and were mainly due to infection.

The neonatal mortality related to the etiology shows that the highest mortality rate was between those newborns with congenital abnormality 100% and those with infection 50%, in HIE mortality rate was (21%) but survivors with long tern sequel is high , those results are shown in table 2.

Table 1. Etiology of neonatal convulsions in 65 neonate

Etiology	**No. of neonate**	**Percent**
Hypoxic- ischemic Encephalopathy	34	53
Infection	10	15
Hypoglycemia / Hypocalcaemia	7	10
Birth trauma / intracranial – hemorrhage	4	6
Congenital abnormality	2	3
Unknown	7	13

P=0 .0004

Table 2 . neonatal mortality according to etiology

Etiology	No. of neonate died	Percent
Hypoxic- ischemic Encephalopathy	7/34	21
Infection	5/10	50
Hypoglycemia	0/6	0
Hypocalcaemia	0/1	0
Birth trauma / intracranial – hemorrhage	0/4	0

Congenital abnormality	2/2	100
Unknown	1/10	10

P=0 .0003

Discussion:

In most of the clinical settings including neonatal intensive care units ,seizures in the newborn are identified by clinical observations.

Perinatal asphyxia is the most frequent cause of neonatal seizures ,in various studies reported incidence is 15-53%, [11,12,13] similarly in our study HIE secondary to perinatal asphyxia was the most common cause of neonatal seizures,34 patients (53%) of babies.

Though the characteristic time of onset of seizure in HIE is 8-36 hr [5],the median age of onset of seizure in HIE is 18.5 hr and this is similar to a study done by Naveen B. and collecs.[14]

Infection which may be acquired by the neonate in utero ,during delivery or after birth was found to be the cause of convulsion in 10 patients (15%) of the cases , a study done by Agay Kumar and collecs [15] shows that infection represent 7% of the causes and in other studies [12,13] 9% of the cases,this may be due to better perinatal care in their countries.

Metabolic causes represent 7 patients(10%) of the cases ,incidence of hypoglycemia in other literature varies from 2-20% [13,14] and the incidence of hypocalcemia range from 1.1-22%,[7] both hypoglycemia and early onset hypocalcemia occur on the first 2-3 days of life,[14] and this is similar to our study were the single hypocalcemic case occur on the first day and other cases of hypoglycemia occur over the first 24 hrs.

Intracranial haemorrhage due to birth trauma was the cause of seizure in 4 patients(6%),similar incidence was reported from most studies dealing with the etiology of neonatal convulsion[6,11] except one recent study which shows that 20% of infant with neonatal convulsion had intracranial hemorrhage showed by U/S examination of the brain.[8]

In our study in 8 cases (13%) the underlying etiology is unknown ,in other study [16] undetermined etiology of clinical seizures varies from 2.4-5.3%,possible causes are on availability of all investigations in our hospital or in some cases short period of survival between first seizure episode and death.

Total mortality rate in our study is 15 patients (23%),the highest mortality was in patients with congenital abnormalities 2 patients(100%),then in those with infection 5 patients(50%),in HIE mortality rate is lower 7 patients (21%) but survivors with long term sequel increased. In review of studies on neonatal convulsion mortality in recent years was found to decrease from 40-20%,this is because of improved obstetric management and modern neonatal intensive care but neurological sequel are still seem in 25-35% of cases.[11,12]

Recommendations :

A fully integrated regimen of assessment and management involving both obstetricians and pediatricians is needed if the incidence of neonatal convulsions is to decrease and their prognosis is to improve .

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