

Full Length Research Paper

The effect of place of delivery on Erb's palsy injury in the Niger Delta of Nigeria

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An increasing incidence of Erb's palsy in the last few years has been noted in our region. To find out the quality of health care in the centers (hospitals) where deliveries took place and to know how early these cases were referred out, a retrospective study of 116 cases of Erb's palsy seen at the University of Port Harcourt Teaching Hospital (UPTH) was analyzed by descriptive and inferential statistics. All the patients referred to our physiotherapy unit with a clinical diagnosis of Erb's palsy between the years 2003 and 2008 were studied. The percentage frequency distribution of incidence of Erb's palsy in private hospitals 61 (52.5%) is statistically significant to the incidence in public hospitals 17 (14.6%). The source of referral of about 32.7% cases was unknown. The private hospitals engaged the services of poorly trained birth attendants unlike the public hospitals that have better trained health attendants. The total percentage of late referrals (71%) was higher than early referrals (29%). This was statistically significant. The mean birth weight was high (3.9 kg). The right upper limb was most affected (62.7%) compared to the left upper limb affected (36.4%). Erb's palsy seems a growing birth related problem particularly in developing countries. There is the need to employ the services of qualified birth attendants coupled with early referrals and implementation of measures to check excess fetal weight gain in a bid to reducing the incidence of Erb's palsy in the Niger Delta of Nigeria.

Key words: Erb's palsy, public and private hospitals, incidence, early referral, trained birth attendants.

INTRODUCTION

Erb's palsy (Erb-Duchenne Palsy) is a paralysis of the arm caused by injury to the upper group of the arm's main nerves specifically, spinal roots C5-C7. These form part of the brachial plexus, comprising the ventral rami of spinal nerves C5-C8 and T1. Erb's palsy is a birth injury that occurs during child delivery. It was initially thought to be due only to the stretching of the nerves of the brachial plexus from the downward traction applied by the birth attendants (Sjoberg et al., 1988; Gherman et al., 1988; Michelow et al., 1994; Kay, 1998). However, other arguments have been put forward indicating that the excessive lateral traction placed on the fetal head and neck is not the only cause of Erb's palsy (Sadleir et al., 1998; Gherman et al., 1999; Qattan et al., 1996; Geutjens et al., 1996). It is postulated that the contractions and

maternal pushing provide the force for the descent of the head and most of the body of the fetus causing the stretching of the nerves before the complete delivery of the fetal head (Sjoberg et al., 1988; Gherman et al., 1988; Michelow et al., 1994). Furthermore, increasing birth weights have been implicated (Sjoberg et al., 1988; Dahlin et al., 2007; Kirkos et al., 1988). Erb's palsy has been reported during a completely spontaneous delivery with no attendant touching the infant (Gherman et al., 1988). Other studies have shown that it occurs with equal frequency regardless of the level of expertise of the delivery or method (including caesarean section) (Gherman et al., 1999; al-Qattan et al., 1996). Shoulder dystocia has also been implicated as a consequence of maladaptation (This is due to macrosomic babies failure to adduct their shoulders in order to reduce their diameter) and the selection of anterior-posterior diameter of the pelvic inlet for passage of the shoulders (Kirkos et al., 1988; Greenwald et al., 1984; Ram et al., 2002; Gonik et al., 1991).

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Table 1. Demographic data of the subjects.

	< 6 months		6 - 12 months		> 12 month		Total	%
	N	%	N	%	N	%		
Male	50	45.1	7	6	6	5.2	63	54.3
Female	40	34.5	5	4.3	8	6.9	53	45.7
Total	90	77.6	11	10.3	14	12.1	116	100
Mean age (years)	0.1		0.54		5.2			
Standard deviation	0.09		0.53		3.6		4.3	
Age range	3 days – 5.5 months		6 – 11 months		1.5 – 14 years		3 days – 14 years	

The male to female ratio is 1:1. The mean birth weight and range was 3.9 ± 1.4 kg and 2.3 – 5.5 kg respectively.

Table 2. The percentage frequency distribution of incidence of Erb's palsy in the hospitals where they were delivered.

Hospital	2003 N	2004 N	2005 N	2006 N	2007 N	2008 N	Total	%	Mean birth weight	Ratio
Private	6	5	11	8	13	20	63	54	3.6 SD=0.8	4
Public	1	1	2	3	3	7	17	14	4.2 SD=0.46	1
Unknown	3	7	7	7	4	10	38	32	3.9 SD=0.13	
Total	10	13	20	18	20	37	116	100	3.9 SD=1.39	

Table 3. Annual frequency distribution of early and late referrals of Erb's palsy.

Referrals	2003	2004	2005	2006	2007	2008	Total	%	Public hospitals	Private hospitals
Early 0 -2 weeks	4	4	5	2	6	13	34	29	36	17
Late > 2weeks	6	9	15	13	15	24	82	71	17	46

However, it is generally agreed that large percentage of Erb's palsy cases were caused by the application of excessive lateral traction on brachial plexus by the birth attendant (Sjoberg et al., 1988; Gherman et al., 1988; Michelow et al., 1994; Kay, 1998).

This study is intended to investigate the incidence of Erb's palsy cases referred for physiotherapy management in University of Port Harcourt Teaching Hospital, Port Harcourt and the quality of healthcare delivery in the hospitals where Erb's palsy cases were delivered. It is also aimed at determining how early these cases are referred for physiotherapy management because of its implication on the outcome of the condition.

MATERIALS AND METHODS

A retrospective study was carried out in UPTH, a 500-bed tertiary health institution in the Niger Delta of Nigeria. The medical records 116 patients referred for physiotherapy management (2003 - 2008) with diagnosis of Erb's palsy were analyzed. Information such as age, sex, affected upper limb, weight at birth and hospitals where the children were delivered were retrieved. Some of the centers where the deliveries took place were visited to ascertain the qualifications of the birth attendants.

Data analyses

The descriptive statistics of mean, range, standard deviation and percentage distribution were used. In addition, inferential statistics of Chi-Square was used to analyze the significant relationship between the frequency of early and late referrals and to determine the influence of private hospitals on the incidence of Erb's palsy. The statistical package used was Epi Info 6.04 d for Windows 2001, the p-level considered significant was at $p < 0.05$.

RESULTS

All the medical records used for the study had information on age and sex (Table 1). However 6, 38 and 63 medical records had no information on the upper limb affected, hospitals where the children were delivered and the birth weight of the children respectively (Table 2). These cases without information on upper limb affected and hospitals where the children were delivered were grouped as unknown in the upper limb affected and hospitals classification respectively. Lack of this vital information was due to the fact that some patients were referred for physiotherapy management very late (Table 3) and their

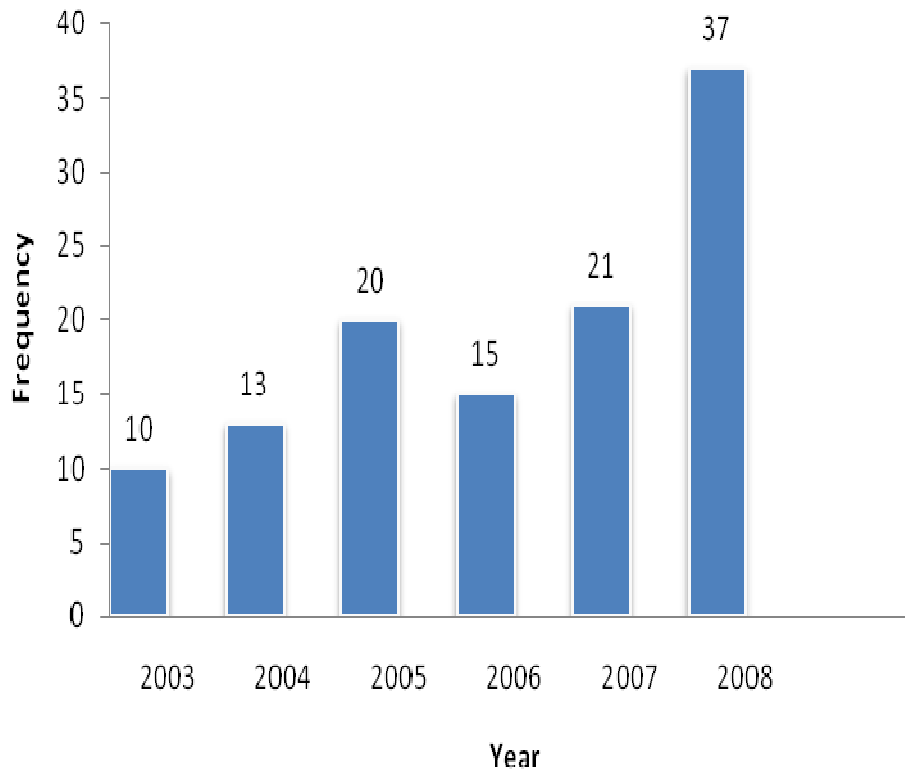


Figure 1. Bar chart representation of annual frequency distribution of Erb's palsy.

mothers or guardians could not remember such information. Others were due to inadequate record keeping (Figure 1). The right upper limb affected 69 (62.7%) was higher than the left upper limb affected 40 (36.4%) in the ratio 2:1 approximately. One out of the 110 (0.91%) records studied had bilateral upper limb (both upper limbs) affected. This was a male child delivered in a private hospital. While the public hospitals had qualified medical attendants in their labor rooms, a lot of them had not updated their training in recent years. A significant number of the private hospitals (75%) had many unqualified birth attendants working in their labor rooms.

Chi square test was used to determine the significant relationship of incidence of Erb's palsy in private and public hospitals. The result showed that the calculated value $X^2 = 15.85 > \text{critical value } X^2 = 11.07$ ($X^2 = 15.85$; $df = 5$, $p < 0.05$). It showed a significant difference in the incidence of Erb's palsy based on where the children were delivered. The incidence was significantly higher in the private than the public hospitals.

The total percentage of late referrals 82 (71%) was higher than early referrals 34 (29%) with ratio 2.5:1. However, in the public hospitals, the early referrals 36 (65%) was higher than late referrals 17 (35%).

Chi square (X^2) test was used to determine the significant relationship between the numbers of patients referred early and those referred late for physiotherapy

management. The result showed that the calculated value (X^2) = 28.95 > critical value $X^2 = 11.070$ ($X^2 = 28.95$; $df = 5$, $p < 0.05$) which means statistically, there is a significant difference between the number of early and late referral of Erb's palsy cases for physiotherapy management. The majority of the Erb's palsy patients were referred late for physiotherapy management. Any case that was not referred for physiotherapy management within two weeks was counted to be among late referrals, while the cases that get to physiotherapy department within two weeks of delivery were referred early.

DISCUSSION

This study has shown a higher incidence of Erb's palsy cases in private hospitals than the public hospitals. It confirms the importance of skilled and well trained attendants in antenatal care and deliveries (Sjoberg et al., 1988; Michelow et al., 1994; Gordon et al., 1973). The public hospitals which are government owned and funded are better equipped and have qualified birth attendants. This cannot be said of privately owned hospitals. They are poorly equipped and funded. In some instance their deliveries are taken by poorly trained birth attendants. Some of these deliveries are done by traditional birth attendants in homes and in some cases in the churches.

The annual frequency distribution of Erb's palsy increased from 2003 - 2008, except for 2006. The drop in prevalence for 2006 may have been accounted for by the decrease in patients' attendance that year following the relocation of the hospital to its permanent site. The increasing incidence of Erb's palsy in the Niger Delta of Nigeria underscores the urgent need to train all birth attendants in public and private hospitals in the area. There is also the need for regulatory health authorities to regularly visit, inspect and accredit private hospitals in the Niger Delta to ensure that they continue to offer the best quality of obstetrics care to their patients.

This study indicated that majority of patients were referred from private hospitals and that patients were often referred late for physiotherapy management. The late referral for physiotherapy management is another pointer to the poor knowledge of the birth attendants. Well trained birth attendants would immediately recognize birth injuries or deliveries with a high risk for injuries and immediately refer such cases to well equipped tertiary hospitals with well trained and highly qualified manpower. Most of the late referrals came from the private hospitals. It is usually recommended that shoulder joints should not be left without exercises for more than two weeks, after injury to ensure that circulation to the affected limb is not affected (Dahlin et al., 2007; Zhang, 2008; Bennet et al., 1976). The lack of development to the circulatory system can leave the arm with almost no ability to regulate its temperature which often proves problematic during winter months when it would need to be closely monitored to ensure that the temperature of the arm was not dropping too far below that of the rest of the body. However, the damage to the circulatory system also leaves the arm with another problem. It reduces the healing ability of the skin, so that skin damage takes far longer than usual to heal and infections in the arm can be quite common if cuts are not sterilized as soon as possible. This will often cause many problems for children since they often injure themselves in the course of their childhood.

This study showed that the mean birth weight of the neonates with Erb's Palsy was high (3.9 kg). This agrees with other studies that macrosomic babies are at a higher risk for dystocia that consequently result in Erb's palsy (Sjoberg et al., 1988; Ram et al., 2002; Gonik et al., 1991). However, it must be noted that most of the cases referred from private hospitals had birth weights lower than those from the public hospitals. It is imperative therefore that if the private hospitals with less qualified birth attendants, takes deliveries of higher weight babies, the incidence of Erb's palsy is likely to increase. A number of factors contribute to big babies. Probably the most influential factors are genetics and unmanaged high blood sugar levels from gestational diabetes or diabetes mellitus. Other factors believed to increase risk include ethnicity (Hispanic women are at risk), obesity, gaining a lot of weight, during pregnancy, going past your due date and even your baby's sex – male babies are more often

than females. And if you have already had a large baby, you are more likely to have large babies in future pregnancies. Big parents often have big babies, but sometimes babies are unusually large because the mother is obese or has developed gestational diabetes during her pregnancy that was undiagnosed or untreated. This finding however brings to bare the need for follow-up during antenatal care to ensure that pregnant women with high risk for macrosomic babies are adequately monitored throughout their pregnancy.

We observed that right upper limb was more affected in cases of Erb's palsy. This finding is consistent with previous reports which incriminated the right upper limbs as most affected compared to the left upper limbs in cases of Erb's palsy (Sjoberg et al., 1988; Ram et al., 2002; Gonik et al., 1991).

In this study we have observed that the problem of Erb's palsy is increasing particularly in the Niger Delta of Nigeria, that delivery in a private hospital are significant risk factors. There is need to implement measures to control excess weight gain in pregnancy and prevent over weight like counseling on appropriate diet. Supervision and audit of private hospitals to ensure they employ qualified hands as birth attendants should be done periodically. A properly supervised antenatal care and delivery by qualified medical personnel will rule out most cases of cephalopelvic disproportion and difficult vaginal deliveries would be avoided. There is also the need to promptly refer all cases of suspected Erb's palsy to well equipped tertiary hospitals to ensure that these babies receive adequate and effective physiotherapy management

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