Case Report

FRONTAL LOBE EPILEPSY THERAPY OF A CHILD; CASE REPORT

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ABSTRACT:

Frontal lobe epilepsy (FLE) is a type of epilepsy in which recurrent seizures arises from the frontal lobes. It is important to characterize frontal lobe epilepsy and distinguish it from non epileptic seizures. In order to investigate therapeutic comprehensions of focal lobe epilepsy this case study was conducted. A 2 year old boy was presented in a private hospital, Islamabad, Pakistan with frontal lobe epilepsy. Chief complaint was fever and recurrent seizures, with the history of left sided focal fits. On the basis of his medical investigation the physician prescribed him ceftriaxone 100mg/Kg/day; acyclovir 100mg/Kg/day; Panadol suspension (Paracetamol) 120mg/5ml/4hrs; phenytoin 180 mg diluted in 100cc Normal Saline over 1 hr as a loading dose; phenobarbitone 200mg diluted in 100cc Normal Saline over 1/2 hrs. Vital signs showed HR 136/min, RR 36/min and 101 °F temperature. Although therapy was effective in dealing with the chief complaint, but certain avoidable clinical errors were observed that required further optimization of the regimen.

Key words: Frontal lobe epilepsy, seizures, chief complaint, clinical errors.

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INTRODUCTION:

Frontal lobe epilepsy (FLE) can be defined as a condition that is characterized by recurrent seizures arising from the frontal lobes of brain. Generally, frontal lobe seizure could be simple partial or complex partial, often with secondary generalization. In frontal lobe epilepsy,the origin of seizures may be from any of the frontal lobe areas, including frontopolar, orbitofrontal, opercular, dorsolateral, supplementary motor area, cingulate gyrus or motor cortex.

Major causes that can lead to frontal lobe seizures could be encephalitis, tumors, frontal lobe lesions, certain birth defects, head trauma, birth defects and certain genetic diseases like an autosomal dominant disease i.e Autosomal Dominant Nocturnal Frontal Lobe Epilepsy.

Age of onset was variable from 10 months to 16 years (mean 7.5 years).The seizures are brief (often < 30 seconds to 2 minutes), stereotypic, nocturnal, and frequent [1]. Frontal lobe seizures are also termed as "complex partial seizures frontal lobe type," "frontal lobe seizures with hypermotor automatisms," "frontal lobe seizures with frenetic automatisms," "frontal lobe seizures with agitated behavior," or "seizures with hyperactive automatisms". They were also termed “hyperkinetic seizures” or “focal motor seizures with hyperkinetic automatisms” in certain publications.
According to the latest report of the ILAE Commission on Classification and Terminology, frontal lobe seizures are classified as “focal seizures” with further descriptors such as “with or without impairment of consciousness” or “with or without observable motor components”[2].
In the US in most centers frontal lobe epilepsy accounts for 20-30% of operative procedures involving intractable epilepsy. [3]

Approximately 456,000 people in the UK have epilepsy (based on 2003 census and a total UK population of 59,554,000) In the UK the annual incidence is approximately 46 per 100,000 or 0.46 cases per 1,000 of population. Epilepsy affects around 50 million people worldwide, 80 per cent of them are in developing countries. In these countries, although most cases can be treated, around 90 per cent of people with epilepsy are not receiving appropriate treatment. [4]

Epilepsy is a relatively common disorder in Pakistan. Based on current data, it is estimated that 1.38 million people suffer from epilepsy in the country. [5] In general population, prevalence of epilepsy is estimated to be 9.99 per thousand. Highest prevalence is seen in people younger than 30 years of age. A slight decrease in prevalence is noted between the ages of 40 and 59. Higher prevalence is observed in rural population. Etiology of epilepsy is more commonly identified in pediatric population. Epilepsy was considered idiopathic in 21 to 76% cases. Only 27.5% epileptic persons in urban areas and 1.9% in the rural areas were treated with AEDs (anti epileptic drugs). [6]

CASE REPORT:

A 2 year old child (boy), Nazeer-ud-din was presented in the pediatric ward of private hospital, Islamabad, Pakistan on 7th October 2011 with the chief complaint of fever and seizures. He had a history of left sided focal fits for past 2 months. According to his family history nobody in his family had epilepsy or diabetes mellitus, though his grandmother was a patient of hypertension. He had no allergy. His thorough physical examination depicted HR 136/min, RR 36/min, weight of 12 Kg, 101 °F temperature, pulse 110/min, pallor skin, pallor eye that were reactive to light but decrease response and focal seizure on left side of body that lasted for not more than 30 seconds.

Patient was keenly observed and monitored to see whether seizures are epileptic or non epileptic. Patient EEG (Electroencephalography) was conducted. It was diagnosed that child was suffering from frontal lobe epilepsy, and the seizure were simple partial seizures or febrile focal seizures. Major cause of seizures was reported to be encephalitis. On basis of present illness and primary diagnosis physician prescribed him ceftriaxone 100mg/Kg/day;

acyclovir 100mg/Kg/day; Panadol suspension (Paracetamol) 120mg/5ml/4hrs; phenytoin 180 mg diluted in 100cc Normal Saline over 1 hr as a loading dose; phenobarbitone 200mg diluted in 100cc Normal Saline over 1/2 hrs.

Therapy was initiated with ceftriaxone 100mg/Kg/day; acyclovir 100mg/Kg/day; Panadol suspension (Paracetamol) 120mg/5ml/4hrs and phenytoin 180 mg diluted in 100cc Normal Saline over 1 hr as a loading dose. Encephalography was done; the result was consistent with left sided focal seizures. CT scan showed a subtle region of increased density in left parietal lobe.

On the 2nd day of therapy, vital signs showed fever of HR 138/min, RR 37/min, pulse 110/min, and 100 °F temperature. From 2nd day of therapy, maintenance doses (24h after load): 6 mg/kg IV in divided doses q8 to 12h of phenytoin was given to patient.

On the 3rd day child did not had fever and vital signs showed HR 121/min, RR 36/min, pulse 108/min, and 98 °F temperature, thus panadol suspension (Paracetamol) was discontinued.

On 5th day of therapy ceftriaxone was discontinued, after bacterial culture tests showed negative result. Therapy was continued with acyclovir 100mg/Kg/day; and phenytoin 180 mg diluted in 100cc Normal Saline over 1 hr as a loading dose until the 12th day of therapy when phenytoin was discontinued and replaced by phenobarbitone 200mg diluted in 100cc Normal Saline over 1/2 hrs loading dose, 18-24 hrs after the loading dose patient was given oral maintainence doses of 3mg/kg/day in divided doses of Phenobarbital elixer (20mg per 5ml). The therapy continued till 14th day, and acyclovir was discontinued after the EEG and CT scan were normal and patient was discharged from the hospital. Child parents were told to continue Phenobarbital syrup for up to 2 weeks.

Aciclovir was prescribed to treat encephalitis; the primary cause of seizure, ceftriaxone was given for presumed bacterial meningitis. Paracetamol was prescribed to treat high grade fever of child, as it is antipyretic. Phenytoin and Phenobarbital were prescribed to deal with seizures.

Recommended doses of ceftioxone for children is 50mg/kg daily by IV infusion, but the prescribed dose is 100 mg/kg/day i.e double the dose recommended. According to BNF IV infusion dose of acyclovir dose in children is 5mg/kg after every 8 hrs, so in 24 hrs the recommended dose is 15mg/kg, but the prescribed dose of acyclovir is 10mg/kg/day. Phenytoin and paracetamol doses prescribed are according to the recommended doses. Phenobarbital loading dose prescribed was 200mg diluted in 100cc Normal Saline, it is higher than the recommended loading dose i.e 180mg diluted in 100cc Normal Saline.

The prescribed drug regimen showed number of drug interactions. Drug- drug interactions in the regimen and their appropriate management are given as follows:

DISCUSSION

Amltava et al., [7] reported an in vitro and in vivo displacement of phenytoin by ceftriaxone has been observed. Increased displacement of phenytoin will result in increased free phenytoin plasma levels. Thus; during therapy monitoring of free phenytoin levels in patients

is required. While; Acetaminophen is metabolized in part by cytochrome P450 (CYP) 2E1, and inducers of CYP2E1 are known to predispose patients to acetaminophen-related hepatotoxicity.

Brackett & Phenytoin induces CYP2C and CYP3A4 isoforms, but not CYP2E1. They suggest, however, that CYP3A4 may participate in acetaminophen metabolism to a greater extent than previously realized, and induction of this isoform may predispose patients to acetaminophen-induced hepatotoxicity. Thus; interaction may be avoided by close monitoring of liver function is recommended.

Parmeggiani et al., [9] reported that acyclovir has potential to decrease the level of phenytoin and seizure activity may increase. Aciclovir can reduce phenytoin plasma concentrations to subtherapeutic values. Therefore; the dose of phenytoin should be adjusted to avoid interaction.

While; Gemma et al. [10], reported aciclovir and ceftriaxone when given concomitantly has potential to cause nephrotoxicity. That need close monitoring of serum creatinine.

CONCLUSION:

The regimen designing (particularly in frontal lobe epilepsy) is a quite critical job and need special attention of health care experts. Though; some time regimen seems to be rational but in real sense that is irrational and need to be optimized by drug experts. Thus; the pharmacists are needed to perform their actual clinical role; patient counseling, prescription review, therapeutical drug monitoring, documentation etc. to optimize and rationalize the therapy planes.

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