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To find the incidence of abdominal epilepsy in children presenting with chronic recurrent abdominal pain with the help of Eeg & To study outcome after treatment

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Abstract

Aim: made to find the incidence of abdominal epilepsy in children suffering from chronic recurrent abdominal pain, with the help of symptoms & EEG, and to study the response to empirical AED in these children

Material and Method: A detailed present & past history was obtained from the patients or their parents'. Associated complaints were also inquired. History of similar complaints in the past was noted. Family history of similar complaints was inquired about in these patients. A detailed general and systemic examination was done in these patients with special focus on abdominal examination & Central Nervous system examination. The patients were evaluated after the reports of the investigations were available. If any worm infestation was found, appropriate treatment with Anthelmintic drugs were given and patient excluded from the study. If patients had Urinary tract infection then patients would be treated accordingly and excluded from the study. Urine examination for porphobilinogen was done in all the patients to rule out intermittent porphyrias as a cause of chronic recurrent abdominal pain & also as an essential investigation prior to antiepileptic drug (oxcarbazepine) being given to all patients included in this study.

Result: In this study the outcome after treatment in these cases was studied & it was found that all the patients with an Abnormal EEG record (37patients) had significant improvement after treatment with anti-epileptic drug oxcarbazepine. And out of the 13 patients with a normal EEG record, 9 patients had a significant improvement in symptoms after treatment with anti-epileptic drugs; however 4 patients did not have any improvement after treatment with Antiepileptic drug oxcarbazepine

Conclusion: Even on intensive search for a cause, cause can rarely be found. In such children diagnosis of the abdominal epilepsy may be considered as, response to anti-epileptic drugs is beneficial in them.

Keywords: Anthelmintic, Central Nervous, porphobilinogen

Introduction

Since many decades abdomen has been described as Pandora's *box* by Gray et al in their book on human anatomy, as, it has many surprises if insensitively dealt with ^[1]. In all these studies the authors recognized a generally characteristic & recurrent clinical pattern but were unable to provide any objective factor to substantiate the diagnosis & to tag the symptoms together into a specific diagnostic entity ^[2]. The clinical nosology was somewhat vague and because of a lack of objective proof of the diagnosis, the cases which were collected often did not constitute a homogenous group ^[3].

Electroencephalographic studies have also, until recently, not yielded a consistent diagnostic picture which would help to put patients who have chronic recurrent abdominal pain into a specific pathological group ^[4]. However, a particular & consistently reproducible Electroencephalographic pattern has lately been found to occur in children having paroxysmal attacks of headache, abdominal pain, & associated autonomic disturbances such as pallor, sweating, temperature changes etc. ^[5].

Chronic recurrent abdominal pain is a common complaint in school going children. Apley & Nash 5, in a survey of 1,000 school children in Bristol, found the complaint to occur in 1 child in every 9.

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Organic cause was found in 7% of a series of 200 investigated cases, emotional factors were thought to be responsible in the rest & there was often a family history of chronic recurrent abdominal pain. The high incidence of abdominal pain reported in school population confirms the impression that it is one of the commonest of childhood complaints [5,6].

In this study an attempt will be made to find the incidence of abdominal epilepsy in children suffering from chronic recurrent abdominal pain, with the help of symptoms & EEG, and to study the response to empirical AED in these children.

Material and Method

The study was carried out in the department of Pediatrics, KIMS university, Karad. 50 patients age group 6-15yrs with chronic recurrent abdominal pain (i.e. pain severe enough to affect child's activity or 3 episodes of abdominal pain within 3 months & abdominal pain associated with nausea, vomiting, bloating, headache, diarrhea and confusion) from may2008 to may 2010 were selected. All the children visiting the pediatric OPD in Krishna hospital from May 2008 to May 2010 with complaints of chronic recurrent abdominal pain (associated with nausea, bloating, headache, diarrhea, confusion, & syncope) for a period of more than 3 months were included in this study. A detailed present & past history was obtained from the patients or their parents'. Associated complaints were also inquired. History of similar complaints in the past was noted. Family history of similar complaints was inquired about in these patients. A detailed general and systemic examination was done in these patients with special focus on abdominal examination & Central Nervous system examination.

The patients were evaluated after the reports of the investigations were available. If any worm infestation was found, appropriate treatment with Antihelminthic drugs were given and patient excluded from the study. If patients had Urinary tract infection then patients would be treated accordingly and excluded from the study. Urine examination for porphobilinogen was done in all the patients to rule out intermittent porphyrias as a cause of chronic recurrent abdominal pain & also as an essential investigation prior to antiepileptic drug (oxcarbazepine) being given to all patients included in this study.

After obtaining the EEG reports, all the patients were started on antiepileptic drug Oxcarbazepine irrespective of the EEG findings. Following the treatment with anti-epileptic drug the patients were asked to follow up in pediatric OPD at an interval of 7 days for one month & then every monthly for period of 2 yrs. They were asked regarding relief of symptoms & examined for side effects. 2 patients who did not turn for follow up were not included in the sample of this study. All the patients were regularly reviewed in OPD subsequently. Detailed history regarding abdominal pain and other related complaints were noted. Patients were asked regarding the improvement in the abdominal pain following treatment with AED's & occurrence of side effects.

The patients were asked to continue anti-epileptic drug for a period of 2 yrs. Patients were asked to follow up in OPD. The data was summarized according to the EEG findings into 2 groups. The incidence of abdominal epilepsy was calculated in the given subjects. The incidence of abdominal epilepsy in Girls and Boys was calculated. Also the percentage of different types of EEG patterns was calculated.

The outcome after treatment in the 2 group's i.e. EEG positive & EEG negative were studied. The results were then statistically analyzed and incidence of abdominal epilepsy was calculated. Each channel represents the difference between two adjacent electrodes. The entire montage consists of a series of these channels. For example, the channel "Fp1-F3" represents the difference in voltage between the Fp1 electrode and the F3 electrode. The next channel in the montage, "F3-C3," represents the voltage difference between F3 and C3, and so on through the entire array of electrodes.

Results

This study was carried out in Department of Pediatrics; Krishna Institute Medical Sciences University Karad during the period of may 2008 to may 2010. 50 children age group 6 to 15 yrs with chronic recurrent abdominal pain were studied & their EEG's were recorded. The incidence of abdominal epilepsy was calculated in these subjects based on EEG records & symptomatology. All patients were treated with empirical anti-epileptic drug & response to anti-epileptic drug was studied. The results of the patients were studied after treatment. Out of the 50 cases, EEG changes suggestive of Abdominal Epilepsy were seen in 37 patients. Thus EEG changes suggestive of abdominal epilepsy were found in 74 % of the children of age group (5-15 yrs) with chronic recurrent abdominal pain.

Out of 50 cases, 13 patients had a normal EEG study & 37 patients had an abnormal EEG. The Incidence of Abdominal Epilepsy based upon EEG records was found to be 74 % in the given study. Out of 37 abnormal EEG cases, 13 cases (35.15%) having temporal type of EEG changes, 12 cases (32.45%) having fronto-temporal type of EEG changes, 11 cases (29.79%) having generalized type of EEG changes, and 1 case (2.7%) having parieto-temporal type of EEG changes. Out of 37 abnormal EEG cases, 13 cases (35.15%) having temporal type EEG changes, 12 cases (32.45%) having fronto-temporal type of EEG changes, 11 cases (29.79%) having generalized type of EEG changes, and 1 case (2.7%) having parieto-temporal type of EEG changes. The most common group affected were females between the age group 9-12 yrs, and the least affected were females between the age group 13-15 yrs. In this study the outcome after treatment in these cases was studied & it was found that all the patients with an Abnormal EEG record (37patients) had significant improvement after treatment with anti-epileptic drug oxcarbazepine. And out of the 13 patients with a normal EEG record, 9 patients had a significant improvement in symptoms after treatment with anti-epileptic drugs; however 4 patients did not have any improvement after treatment with Antiepileptic drug oxcarbazepine.

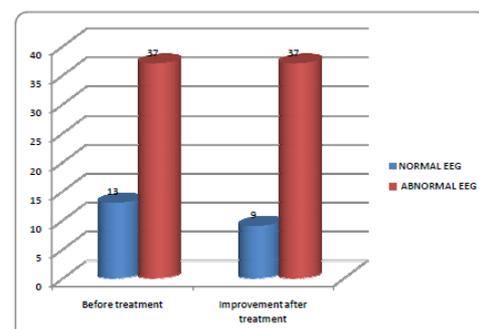


Fig 1: showing the outcome after treatment with oxcarbazepine

Discussion

Abdominal pain is a common complaint of children. Chronic recurrent abdominal pain is a perplexing problem for pediatricians. Amongst the various causes of such pain, abdominal epilepsy is comparatively uncommon cause and hence infrequently studied problem. This study was carried out to find out the incidence of abdominal epilepsy in children age group 6-15 years who have chronic recurrent abdominal pain. This study was carried out in the Department of Pediatrics, KIMS, Karad between the period of May 2008 to may 2010.

In this study 50 children in the age group 6-15 years with chronic recurrent abdominal pain were interrogated with the help of their parents, investigated with routine investigations & whenever indicated (when "red flag" signs were present) were subjected to Ultrasonography of the abdomen and pelvis. In all 50 children EEG records with the conventional bipolar leads were taken. All children were investigated with urine examinations which showed that no child had urinary tract infection. Test for urine porphobilinogen was also done in all children & it was confirmed to be negative especially before starting anti-epileptic therapy. Schade *et al.* [7], reported that none of their patients with abdominal epilepsy had any abnormality of the genitourinary tract and urinary infections. Worm infestation is a frequent cause of chronic recurrent abdominal pain in children [8]. Stool examination was done, which did not reveal any worm infestation or other infection in any of the child we included in this study.

Initially, we came across 5 patients who had "red flag" signs positive having ultrasonographic findings of mild to moderate enteritis, and 1 patient with multiple lymphadenopathy. All these 6 patients were excluded from our study. The pathophysiology of abdominal epilepsy remains unclear. Temporal lobe seizure activity usually arises in or involves the amygdala [9]. Thus, the patients who have seizures involving the temporal lobe usually have Gastrointestinal symptoms, since discharges arising in the amygdala can be transmitted to the gut via dense projections to the dorsal motor nucleus of the vagus. In addition, sympathetic pathways from the amygdala to the GI tract can be activated via the hypothalamus [10]. On the other hand, it is not clear whether the initial disturbance in abdominal epilepsy arises in the brain. There are direct sensory pathways from the bowel via the vagus nerve to the solitary nucleus of the medulla which is heavily connected to the amygdala. These may be activated during intestinal contractions.

The diagnosis of epilepsy is essentially a clinical one; however EEG forms an important supportive evidence for the diagnosis of epilepsy. EEG was done in all of our 50 children with chronic recurrent abdominal pain. EEG was reported by a Professor of Physiology having experience in reading EEG's & discussed the EEG records with her in detail. In our study of 50 children with chronic recurrent abdominal pain 37 children (74%) had an abnormal EEG record.

EEG analysis was done and it was observed that temporal lobe EEG changes was the most commonest (35.15%), fronto-temporal was second commonest (32.45%) followed by generalized (29.75%) whereas parietofrontal EEG changes had the least incidence (2.7%) in children with

chronic recurrent abdominal pain whom we studied. Peppercorn MA4, & Babb RR Eckman PB34 observed that abdominal epilepsy was most commonly associated EEG abnormalities in one or both temporal lobes, and may include paroxysmal positive spikes at 14 and / or 6/s or generalized slow wave dysrhythmias. Schade *et al.* 25 in 1960 reported that a temporal focus was seen in 22 patients from the 46 reviewed. The diagnostic yield of EEG is increased by activation procedures like photic stimulation & hyperventilation, thus we used activation procedures in all our patients during EEG recording. We found there was no change in the EEG recording when activation procedures were used.

In this study out of 50 children age group 6-15 yrs with chronic recurrent abdominal pain, the electroencephalographic records suggestive of epilepsy were seen in 37 children indicating an incidence of abdominal epilepsy as 74 % based on EEG abnormalities & symptomatology.

In our study of the 37 children with abdominal epilepsy (based on EEG & symptoms), it was found that the incidence was more in girls (67.5%), than in boys (32.5%). In studies by George H. Schade & Helen Hoffman (1960) the incidence in boys was 56.5 % & in girls was 43.5 %. In other studies by Douglas, E.F & White, P.T2 (1971), the incidence in boys was 40 % & that in girls was 60 %. Peppercorn & Herzog 19 reported 10 cases of abdominal epilepsy, all were females. The significance of a totally female population in their series is not clear. Neuroendocrine dysfunction has been described in women with temporal lobe epilepsy, but the relationship of such abnormalities to the occurrence of GI symptoms has not been studied in such patients [11].

In our study on follow up all the 37 children of chronic recurrent abdominal pain who had an Abnormal EEG suggestive of abdominal epilepsy, all had significant decrease in the symptoms of abdominal pain, nausea, vomiting, giddiness & diarrhea. And out of the 13 patients who had a normal EEG and chronic recurrent abdominal pain, 9 patients had significant decrease in the symptoms of abdominal pain, nausea, vomiting, giddiness & diarrhea [12].

In this study of 50 children age group 6-15 years with chronic recurrent abdominal pain suggestive of abdominal epilepsy were treated with oxcarbazepine. All the patients were advised to continue oxcarbazepine for a period of 2 years and were asked to follow up once a week, initially for the first one month, and then once monthly for 2 years while on treatment. Oxcarbazepine was used in the dose of 10 mg/kg/ day given in 2 divided doses.

Oxcarbazepine was used in this study because most of the cases had temporal changes in EEG. Also sedative effects of oxcarbazepine are less compared to other drugs [13]. Side effects of oxcarbazepine are ataxia, rashes, abnormal vision, diplopia, dizziness & vertigo. These side effects are less compared to the side effects seen with use of carbamazepine. However in our study we did not come across any patient with the complaints of diplopia, rash, ataxia, vertigo, abnormal vision & dizziness. Oxcarbazepine is a structural derivative of carbamazepine, with a ketone in place of carbon-carbon double bond on the dibenzazepine ring, this difference helps to reduce the impact on the liver of metabolizing the drug, also this helps to reduce the side

effects like anemia & agranulocytosis which are commonly encountered.

Conclusion

It is thus concluded in the study that diagnosis of abdominal epilepsy can be made in children with chronic recurrent abdominal pain in the age group 6- 15 yrs after ruling out visceral disease, a) clinically, and with support of b) on EEG findings, & with c) on response to anti-epileptic therapy (oxcarbazepine).

Pediatricians commonly encounter children who have chronic recurrent abdominal pain. Even on intensive search for a cause, cause can rarely be found. In such children diagnosis of the abdominal epilepsy may be considered as, response to anti-epileptic drugs is beneficial in them.

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