APPRAISAL OF DIRECT COST OF TREATING EPILEPSY PER MONTH IN GUNTUR, ANDHRA PRADESH.

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ABSTRACT

OBJECTIVE: The aim of this study was to estimate in financial terms, the direct health care costs of treating epilepsy per month of clinic attendance and to relate these costs with the individual patients monthly income. METHODS: This is a cross sectional study conducted among inpatient attendees at the specialist pediatric service provided in secondary care hospital in Guntur, AP, from July 2015 to December 2015. RESULTS: A total of 120 patients were interviewed. 67% male child patients and 33% female child patients were included. The majority of patient's parents are employed. 48% patients were prescribed by the phenytoin, 31% patients were prescribed by the sodium valproate, in combination therapy 15% patients were prescribed by the both phenytoin+ sodium valproate. The biggest contributor was drug cost (9,991,800Rs). The direct cost of treating patients with epilepsy per month in 94 patients was 10,891,800Rs. The mean direct cost of epilepsy care determined from this study is 1,815,300Rs. CONCLUSION: Medication costs contributed the most to the direct costs of treating epilepsy. More than 45% of patient's parents on regular income spend 60% or more of their income in the treatment of epilepsy. Efforts towards reducing the direct cost of treating epilepsy should be directed towards mitigating the cost of the medications, transportation and service charges through appropriate policy interventions. In this study some ADR's were also observed.

KEY WORDS: Epilepsy, Pharmacoeconomics, Direct cost, Mean direct cost.

INTRODUCTION: Epilepsy is the most prevalent and serious neurological occurring in more than 50 million people worldwide[1]. Across Europe, 130,000 new cases of epilepsy are recorded each year among children and adolescents (an incidence rate of 70–80 per 100,000. The incidence is particularly high during the first year of life, and the likelihood of developing the condition then decreases during childhood. Anti-epileptic drug therapy is the primary treatment for children with epilepsy, with the aim of preventing seizures, and approximately 70% of patients become seizure-free with optimal drug therapy. Children who have severe, symptomatic epilepsy are those who are most commonly prescribed rescue medication. The longer a seizure continues increased risks of subsequent prolonged seizure activity, memory deficits and learning difficulties. In addition, the impact on health resources is greater because these patients require more intensive medical assistance. Then costs of direct medical care for children with epilepsy can be very high[17]. The choice of drugs varies considerably among physicians both within hospital and across the country. Prompt treatment with rescue medication is an important aspect of care for children experiencing PAC however, such treatment provides a particular challenge because these seizures occur predominantly in the community setting where rescue medication and trained careers may not always be available. Concerns about rising costs, unexplained variations in utilization, and limited information about long-term patient outcomes have ushered in an era of cost containment and accountability. At a time when a wealth of new epilepsy treatments has become available, payers increasingly demand evidence that the costs of treatments are justified by the scope of the problems and the outcomes they produce. Results of cost-effectiveness studies have influenced policy decisions in several European countries.

AIM AND OBJECTIVES: The aim of this study was to estimate in financial terms, the direct health care costs of treating epilepsy per month of clinic attendance and to relate these costs with the individual patient's monthly income. To identify the principal cost drivers and to estimate based on monthly costs the total cost per patient per six months.

METHODOLOGY

This study had a cross sectional design and was conducted among inpatients attendees at the specialist of pediatric department of secondary care hospital at Guntur

in AP. The patients were interviewed from July 2015 to December 2015. Exactly 94 pediatric patients were randomly chosen in this study. Only consenting patients who had diagnosis of epilepsy were included in the survey. The patients were interviewed by using some oral questions. Information collected included socio demographic item (age, sex, and occupation of the parents) and clinical variables including duration of epilepsy, medication prescribed, interval since the last seizures episode etc. Also the patients were asked by cost of transportation, consultation fees, hospital staying costs and other hospital charges. The cost of the medications was obtained from the hospital pharmacy and computed for the patients interviewed. The costs of EEG and CT

scan and other investigations were excluded because they did not contribute to the cost per month. For the calculation of direct cost, case files of all patients registered in the hospital were retrieved. For estimating indirect cost, patients or attendants coming to the clinic were interviewed on two occasions.

Direct costs include any costs of resources directly involved in the delivery of services and include capital costs (property, plant and equipment) and variable costs (such a supplied, lab tests hourly wage, and personnel). For example: cost of inpatient care to the institution could include cost of the medication (acquisition), personnel costs and hospital day costs.[18]

RESULTS
1. Age and sex distribution of patient:

Age range	< 1 year	2-5 years	6-10 Years	>10 years
Mch	15 (16)	23 (24.4)	18 (19.1)	7 (7.4)
Fch	4 (4.25)	5 (5.3)	19 (20.2)	3(3.1)
Total	19 (20.2)	28 (29.7)	37 (39.3)	10 (11)

A total of 94 patients were interviewed, in this 63 (67%) male child patients and 31 (33%) female child patients were included. The age range was 8 months to 12 years. 39 % of the patients was in the range of 6-10years. And MCh patients were more compared to the FCh patients.

2. Duration of epilepsy:

Duration	Number	Frequency
1-5 years	58	62
5-10 years	25	27
>10 years	11	11
Total	94	100

The duration of epilepsy was 1 year to 10.5 years and most of the people (62%) were having the duration of 1-5 years.

3. Employment status of patient's parents:

Employment status	Number	Frequency
Employed	54	57.4
Unemployed	40	42.4
Total	94	100

Based upon the employment status of the patient's parents 57.4% were employed parents and 42.4% were unemployed parents.

4. Prescribing pattern:

S.No	Drug name	Number	Frequency	Cost per head(Rs)	Total cost (month)
1.	Phenytoin	45	48	32	43,200
2.	Sodium valproate	31	33	28	260,400
3.	Phenytoin+sodium valproate	14	15	32+28	25,200
4	Phenobarbitone	2	2.12	22	1,320
5.	Carbamazepine	1	1	38	1,140
6.	Carbamazepine+ phenobarbitone	1	1	38+22	1800

Anti epileptic drug Monotherapy,and combination therapy both therapies were used . 48% patients were prescribed by the phenytoin, 31% patients were prescribed by the sodium valproate, in combination therapy 15% patients were prescribed by the both phenytoin+ sodium valproate. In this study most prescribed drug was phenytoin followed by sodium valproate and their cost was 32Rs and 28Rs.

5. Mean cost of epilepsy treatment:

	Drugs	Transportation	Administration	Feeding
Total cost(month)	9,991,800	94,650	9,00,000	2,60,700
Range (N)	1320-260,400	600-2250	6000-15,000	3400-4500
Mean cost (month)	1,665,300	15, 775	150,000	43,450
Total cost per half year	5,99,50,800	5,67,900	5,40,000	1,564,200

For calculating the mean cost of epilepsy treatment 94 patients were having the drugs cost, transportation cost, administration cost and feeding cost and these were computed. Based up on the results, for drugs 9,991,800Rs, for transportation 94,650Rs, for administration 9,00,000Rs and for feeding 2,60,700Rs paid per 1month. The mean cost for these were included 1,665,300Rs for drugs, 15,775Rs for transportation,150,000Rs for administration and 43,400Rs for feeding. Totally 5,99,50,800Rs were using for medicines in 6 months period.

DISCUSSION
The study has explored the direct cost aspects of treating epilepsy in a secondary care hospital in Guntur at Andhra Pradesh. The direct cost of treating patients with epilepsy per month in 94 patients was 10,891,800Rs apart from these the major costs are transportation and administration. It is not uncommon for people in rural areas to travel long distances to hospital for treatment. Sometimes people who wish to attend hospital may leave a day are two days before the hospital days. In such cases the extra cost of accommodation increases the cost of treatment.

In this study Mch patients are more in compared to the Fch patients from this we assess the Mch patients are more proned than the Fch patients. 62% patients are having epilepsy duration of 1-5 years. 57% of the patient's parents were educated and doing the jobs but they spending 60% of their income on treatment for epilepsy these burden will shows effects on other members of the family. Among the working persons, the percentage of their individual monthly income spent on seeking medical care per month ranged from 7%-95%. The mean direct cost of epilepsy care determined from this study (1,815,300Rs) probably reflects on under estimate since it did not include certain direct care costs like laboratory and radiological investigation and represents a fraction of the full cost of the condition. The indirect cost includes treating the condition including lost productivity, cost of absenteeism, unemployment, stigma and lost opportunity resulting from the condition.

The cost of AED's was the single most important direct cost contribution in the group of patients studied, similar to the findings in other studies[5,8,9]. It has been observed that the costs of the treating epilepsy may vary with the seizure type, severity, and frequency[10]. The highest cost was in patients receiving sodium valproate alone but occupied second position in prescribing pattern. The mean cost of using mono therapy was more compared to multi drug therapy. The most commonly used AED's were phenytoin and sodium valproate in mono therapy and phenytoin + sodium valproate in combination therapy. Studies from Oman[6] and Hong Kong[7] showed that mono therapy use was as high as in our study the mean cost of treating patients with sodium valproate and phenytoin was much higher than that patients treating with drugs like phenobarbitone and carbamazepine. The prescription pattern in pediatric patients was different from adult patient. Based on the literature, the high proportion of costs for drugs was not unexpectedhowever; transportation, administration and feeding charges contributed a smaller definite proportion of the direct cost in treating these patients. Improving infra structure reducing service charges for patients with epilepsy will reduce the direct cost of the treatment. While giving the treatment 7-8 patients suffering with ADR's these ADR's are due to usage of phenytoin. So that phenytoin can be replaced by sodium valproate.

CONCLUSION
From this study we concluded that medication costs contributed the most to the direct cost of treating epilepsy and this tended to be higher for patients receiving multi drug treatments like phenytoin + sodium valproate. Apart from these medication cost, transportation cost, administration cost will also contributed to the percentage of the total cost. 57% patient's parents are employed so there will be the absenteeism in jobs which is difficult to the family. Efforts towards reducing the direct cost of treating epilepsy should be directed towards mitigating the cost of the medications, transportation and administration charges through appropriate policy interventions. In this study some ADR's were also observed.

ABBREVIATIONS
PACS - prolonged, acute, convulsive seizures
EEG - Electroencephalography
CT - Computerized Tomography
Fch - Female Child
Mch - Male Child
AEDS - Anti Epileptic Drugs
ADR'S - Adverse Drug Reactions

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