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THE COST EFFECTIVE ANALYSIS OF DIFFERENT ANTIBIOTIC USED IN TREATING TYPHOID FEVER IN A TERTIARY CARE CENTRE

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ABSTRACT

Objective: To study the cost effective analysis of various antibiotics in the treatment of Typhoid fever in adult population. **Methods:** In our retrospective study we analyzed 50 case sheets of Typhoid fever patients who were admitted to Sri Muthukumaran Medical College Hospital & Research Institute, Chennai. From January 2014-December 2014 in which various antibiotics given I.V and oral routes were analyzed. We found that commonly Mox, Ceftrixone, Azithrol, Cifran, Chloramphenicol, Trimethoprim+sulfamethoxazole ware used I.V antibiotics showed better improvement than oral antibiotics. So we applied cost – effective analysis of antibiotics and a Pharmacoeconomics evaluation was done. The cost effectiveness co-efficient was calculated as the ratio of antibiotics price. **Results:** The cost effectiveness co-efficient ratio showed continuous i.v. administration of antibiotic is more expensive than the switch over therapy. **Conclusion:** Timely switch over from I.V antibiotics to oral antibiotics in an appropriate patient is an efficient way to safeguard the undesirable expenses.

KEYWORDS: Amoxicillin, Cifran, Azithromycin.

INTRODUCTION

Typhoid fever is one of the important causes of morbidity in India. Antibiotics in typhoid fever patients are usually to start with oral antibiotics are advised in patients with easy clinical course of typhoid fever. Intravenous (I.V) antibiotics are reserved for patients but the

disadvantage is that there is likelihood of complications such as thrombophlebitis, skin abscess and sepsis. So the most suitable therapy is the oral administration. Therefore the patients who are capable, it is appropriate to change from I.V. to oral administration as soon as there is improvement of general clinical condition (i.e. called switch therapy) Apart from better patient's compliance, the switch over therapy has significant pharmacoeconomics consequences. They shorten the duration of hospitalization as well as the costs of giving oral administration. The price of I.V. Application is high due to the costs incurred during the production of I.V. medicine and the associated expenses price of I.V. administration (infusion set, medical personnel etc.) out study aims at the favorable pharmacoeconomics impact of timely conversion from i.v. to oral route of antibiotic administration.

METHODS

Within a period from January 2014 to December 2014 to patients were hospitalized at Sri Muthukumaran Medical College Hospital & Research Institute, Chennai. Out of these patients we have selected 50 patients with typhoid fever whom first I.V. antibiotics was effective or there was a switch in their therapy, i.e. the I.V. antibiotics used at the starting of treatment was changed to oral antibiotics when the condition had improved. The cost – effectiveness was compared between the group of 50 patients who had received only i.v. antibiotics during the entire duration of treatment and the group of 13 patients who had received the switch therapy. We drew all the date from the documentation of Medical Record Department of Sri Muthukumaran Medical College Hospital & Research Institute, Chennai.

Statistical analysis

Statistical analysis was done using statistical package for the social sciences (SPSS) software version 20 and results were analyzed following methods independent samples test, chi-square tests and paired samples test. The value of below 0.05 was considered to be statistically significant. Demographic date (age, sex etc.) are categorical variables and patients baseline characteristics were summarized by treatment groups using descriptive statistics to assess difference in any between the. Mean and standard deviation was provided for categorical data. For comparing two continuous variables non – parametric Mann – Whitney test was used.

RESULT

Table 1. Shows baseline characteristics of the patients in the study: age, gender, mean duration of diseases (in months). Table 2 depicts the daily dosage required by the patients and

the cost of each antibiotic regimen per day. Table3. describes the number of patients who had received continuous I.V. administration of antibiotics and those receiving the switch therapy (i.e. in the beginning i.v. antibiotic was given which was later changed to oral antibiotic depending upon the clinical improvement of symptoms) in the entire duration of treatment. It also shows the effective cost of treatment in each therapy by summing up the total expenditure of all the patients in each group for different antibiotics regimen administered. According to Mann-Whitney test all shows statistical significance with p value<0.001 among the groups. The most important parameter of our study i.e. cost – effective coefficient of each antibiotic was analyzed and shown in Table 4. We found that continuous i.v. administration of antibiotic is more expensive than the switch therapy.

TABLE 1: Baseline patient characteristics.

Characteristics	**SwT (n=27)**	**I.V (n=23)**
No of Patients	27	23
Mean of age	53.10	53.50
Standard Deviation	8.385	8.819
Gender		
Male	11 (41%)	10 (43%)
Female	16 (59%)	13 (57%)
Age Groups		
<40 Years	2 (7%)	4 (17%)
41-60 Years	20 (74%)	13 (57%)
>60 Years	5 (19%)	6 (26%)
Mean Duration of Disease (Month)	7 ± 7.2	5 ± 6.7

SwT - switch therapy, i.v.-intravenous. Data in the above tables are expressed as mean± SD except for categorical variables where it is expressed as absolute number with percentage in parenthesis. There is no statistically significant difference in the baseline parameters between both the groups.

TABLE 2: Daily dosage and price of antibiotics used in the study.

Antibiotics	**Daily Dosage**	**Price / Daily (RS)**
Ceftrixone	1-2g/d iv	122Rs/day
Azithromycin	1g/daily p o	50 Rs/day
Ciprofloxacin	400mg/iv b d, 500mg/p o b d	i.v 46Rs/day, p o 18 Rs/day
Amoxicillin	2g q6h iv, 1gm p.o.t.d.s	i.v 128Rs/day, p o 52Rs/day
Chloramphenicol	25mg/kg t.d.s.p.o	64Rs/day

Table 3:No.of patients treated with antibiotics, effective cost and mean duration of hospital stay.

Antibiotics (AB)	No. Of. Patients (n)		Effective cost (Rs)/Patient	
	Oral	I.V.	Oral	I.V
Ceftrixone	0	12	-	857
Azithromycin	3	0	350	-
Ciprofloxacin	5	6	126	322
Amoxicillin	7	9	128	896
Chloramphenicol	8	-	448	-

Table 4: Cost – effective coefficient.

Antibiotics (AB)	Cost-effective coefficient (Rs)		p
	SwT	I.V.	
Ciprofloxacin	5	6	<0.001
Amoxicillin	7	9	<0.001

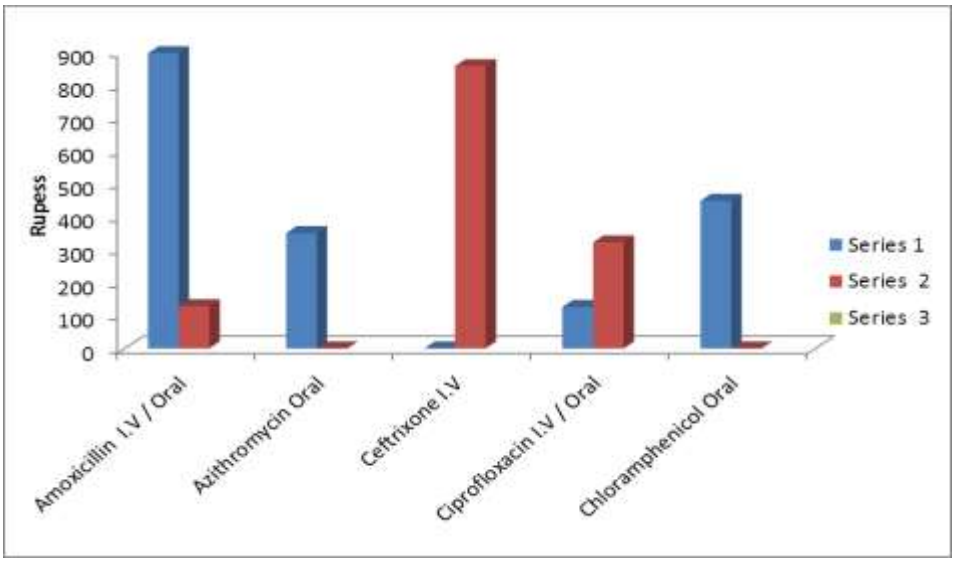

Fig 1: Comparison of cost of different antibiotics (oral & I.V) used in typhoid fever.

DISCUSSION

Treatment of typhoid fever requires timely administration of antibiotics. India is a country with more than a billion population and it needs cost – effective measures in its healthcare system to provide better treatment facilities to its people. Our study is an effort to find out the most cost-effective method of antibiotic regimen used in a tertiary care hospital. We chose the cost-effective analysis for our Pharmacoeconomics study. The most important parameter to analyze here is the cost-effective coefficient. (wawruch M et al)We only calculated the direct cost of antibiotics per daily dosage till the patient completed treatment. We did not calculate other expenses like transportation fee to hospital, staff wages, hospital bed charges, diagnostic tests or other therapeutic alternatives during hospitalization. (Mandelll et al)No

difference in the effectiveness of treatment between continual i.v. administration of antibiotics and switch therapy was found in our study. Patients who are capable of oral administration and are not at high risk in terms of prognostic factors is a suitable candidate for switch therapy. This cuts down the expenses significantly. (Robinoson R et al).

CONCLUSION

Timely switch over from I.V antibiotics to oral antibiotics in an appropriate patent is an efficient way to safeguard the undesirable expenses. Moreover it has an advantage of being better patient's compliance. This study may also set an example to reduce the expenses for the treatment of other diseases where ever if applicable.

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