

Original Research Article

Study of direct cost of care among ENT surgical inpatients at a tertiary teaching hospital

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ABSTRACT

Background: Cost of care in hospital includes direct cost and indirect cost. Direct cost is a price that patient pays to hospital in form of expenditure. Ever-growing health cost is concern for both health care provider and health care seeker.

Methods: Non-sponsored self-paying inpatients of ENT department were included in this prospective study. Structured proforma was used to extract information regarding surgery cost, investigation cost, pharmacy cost, patient care charges and hospital staying charges.

Results: Out of 33 patients 49% were admit for >6 days, 39% were admitted up to 3 days, while 12% patients stayed for 4-6 days. Average surgery fees charges were 37% and pharmacy charges and investigation charges were about 25%. 82% patients were operated under general anaesthesia while 18% patients were operated under local anaesthesia.

Conclusions: Major surgery under general anaesthesia force patients longer stay in hospital and increases cost of care by increasing pharmacy and investigation bill. So, we should focus on anaesthesia time, anaesthesia type and judicious use of investigations for reducing overall health cost care to make it affordable to all.

Keywords: Direct cost, ENT surgery, Indirect cost, Length of stay, Type of anaesthesia

INTRODUCTION

Expanding health care cost has been a source of concern to health care providers and managers over the past few years in many developing countries.¹ Economic constraints remain one of the major limitations on the quality of health care provided even in developed world. There are five measure heads in whom total health expenditure usually occurs viz. surgery fee, investigation fee, pharmacy charges, patient care charges and last but not the least hospital staying charges. Patient care charges and hospital staying charges are directly related to length of stay (LOS) in the hospital. LOS has therefore been

used as one of the indicators employed to determine hospital performance.² Hospitals with reduced LOS are said to have done better than others with longer stay. Analysing health procedures with a business prospective is not a natural tendency among many health care workers. Most doctors would feel uneasy about analysing their interventions with cost and profit in mind. Several studies have shown that cost effective measure can be utilise without compromising patient care.³ Unfortunately, the number of studies that report the cost of care of surgical inpatients is quite small, as few economic analyses relating to management of surgical inpatients have been conducted in India. Therefore, it is

important to know the cost of care and identify its determinants. This will assist in identifying ways to reduce the financial burden. This study aimed to estimate the direct cost of hospital stay and to document the determinants of cost of care to ENT surgical inpatients.

METHODS

Prospective observational research design was used to study the medical bills of patients who were admitted in Department of ENT at a tertiary care teaching hospital and underwent surgery were considered for the study. Inclusion criteria was all non-sponsored self-paying admitted to general ward and operated under general or local anaesthesia. Patients that were excluded include those that had day case surgery and patients admitted in the private suit and the patients who were sponsored by government or insured patients. Structured pro-forma was used to extract information on expenditure under various heads. The data were recorded as per proforma after taking written informed consent. Statistical analysis was performed with SPSS version 19 and Fisher’s exact test and Chi square were used to calculate ‘p’ values while The Karl Pearson’s test was used to study the relationship between different heads of expenditure and total expenditure.

RESULTS

The present study includes 33 ENT surgical inpatients admitted in the department of ENT during the period from March 2016 to May 2016. Patients were grouped according to length of stay in the hospital. Out of 33 patients 16 (49%) were admit for >6 days, 13 (39%) were admitted up to 3 days, while 4 (12%) patients stayed for 4-6 days. Patient’s total expenditure was divided in to 5 different subgroups of expenditure viz. Surgery fees, investigations, pharmacy, patient care charges and hospital staying charges. Average surgery fees charges were 37% of total bill, followed by the contribution from pharmacy charges and investigation charges (Table1).

Table 1: Range of expenditure for different heads in percentage.

N=33	Minimum	Maximum	Percentage
Surgery	8.6	51.6	37
Investigation	10.3	61.2	22.5
Pharmacy	12.9	50.2	24.2
Patient care charges	3.2	18.3	8.4
Staying charges	5.0	14.8	7.9

Out of 33 patient 27(82%) patients were operated under general anaesthesia while 6 (18%) patients were operated under local anaesthesia. Data interpretation from present study showed that there was a statistical positive (r = 0.88) correlation between length of hospital stay and total

expenditure among ENT surgical in patients. Hence it can be interpreted that as number of days in hospital increases the expenditure also increases. A linear regression data shows that after every 1.2 days of lengthened hospital stay total expenditure increases by 0.87 units, which is statistically significant (p <.05). Proportional relationship between type of anaesthesia and total expenditure was analysed. There is no statistically significant association between type of anaesthesia and total expenditure (p>.05).

Table 2: Correlation between different heads and total expenditure.

Variables	‘r’ value	sig
Surgery	0.94	0.0001
Investigation	0.88	0.0001
Pharmacy	0.68	0.0001
Patient care	0.87	0.0001
Staying charges	0.93	0.0001

The Karl Pearson’s test was used to study the relationship between different heads of expenditure and total expenditure (Table 2). The data shows that there is a very good statistical correlation between surgery cost and staying charges with total expenditure. Data also shows that there is good statistical correlation between investigation charges and patient care charges with total expenditure. There is average statistical correlation between pharmacy charges and total expenditure (for all heads p<.05).

DISCUSSION

The present study was undertaken with aims to study proportion of different heads of expenditure in total direct cost in ENT surgical inpatients and to study the measures for increasing hospital earning, reducing the burden of cost on patients while maintaining highest standard of health care quality possible.

About 50% of the study patient were admitted in the hospital for 7 or >7 days while 40% of the patients stayed for less than 3 days. Length of stay in the hospital depends mainly on the type of surgery and the type of anaesthesia. Ilesanmi OS also mentioned that cost of surgery is 50% of total care expenditure.⁴ It also depends on the distance of patients residence from the hospital as when the patients are from the far away they wish to stay for one more day as to avoid any problem to the patients as they might have some problem at house and then it is difficult to them reach back to hospital with in time.

A few patients wish to go home after removal of stitches only for the same reason of far distance of their residence. Ilesanmi OS, and Fatiregun AA also mentioned average length of stay to 11 days with range of 5 days to 20 days.⁵ Neuman MD concluded that use of regional anesthesia compared with general anesthesia was not

associated with lower 30-day mortality but was associated with a modestly shorter length of stay.⁶ In a study conducted in USA conclusion was that reducing LOS by as much as 1 full day reduces the total cost of care on average by 3% or less.⁷

So, it concludes that length of stay depends on the type of surgery, type of anaesthesia and distance of patients' residence from the hospital. Out of total expenditure major contributor for total bill are surgical cost (avg 37%) followed by pharmacy (24%) cost and investigation (22.5%) cost.

We cannot change cost of surgery as it is fixed determinant. We can think about the cost involved in the investigation and the pharmacy. Major contributor of investigation cost is laboratory investigation. So, we should try to avoid unnecessary investigations. Same is true for the pharmacy cost as it depends on what be prescribed, so if we judiciously use medication and prevent wastage of medication, we will be able to reduce cost of care in surgical patients dramatically.

In the present study out of 33 patients >80% patients were operated under general anaesthesia and rest were operated under local anaesthesia. Type of anaesthesia increase medical bill as general anaesthesia lengthens the hospital stay in the form of prolonged observation, added observation charges and added cost of anaesthetic medication. Osman Y concluded that endoscopic ear surgery may be performed with local anesthesia in adult patients, with advantages of postoperative period faster recovery and lower incidence of nausea and vomiting.⁸ Ralli G et al concluded that with proper preoperative selection of the patients, mastoidectomy with tympanoplasty can be carried out in a day surgery setting with no significant effects on effectiveness of surgery and post-operative symptoms.⁹

Data was entered, studied and analyzed with SPSS version 19. Frequencies, relationship and proportions were generated. Percentage wise distribution of different charges was done. We found a wide range of cost in different determinants. Surgery cost varies from about 8% to 50% of total expenditure. Investigation cost ranges from about 10%-61%, while pharmacy cost varies from 13%-50% of total expenditure. Patient care charges and hospital staying charges in general ward varies from about 5% to around 15% of the total expenditure. So, it is concluded that surgery cost, pharmacy cost and investigation cost amount at least 10% of contribution in each bill and these may cost >50% depend on the type of surgery and type of anaesthesia. It also concludes that in general ward patient care charges and hospital staying charge are at least 5% of total bill and may go up to around 15% of total expenditure.

Present study also shows that there was a statistical positive ($r = 0.88$) correlation between Length of hospital stay and total expenditure among ENT surgical in

patients. Hence it can be interpreted that as number of days in hospital increases the expenditure also increases. A linear regression data shows that after every 1.2 days of lengthened hospital stay total expenditure increases by 0.87 units, which is statistically significant ($p < .05$). So, it concludes that we should make every effort to shorten the hospital stay as it reduces the total expenditure and also the chances of hospital acquired infection and the indirect cost related to patients' hospital staying. Belitova M et al concluded that there is no difference in respect to length of stay, discharge time and major/minor complications rate between two groups of local and general anaesthesia.¹⁰

Study depicts the proportional relationship between type of anaesthesia and total expenditure. There is no statistically significant association between type of anaesthesia and total expenditure ($p > .05$). This might be possible because there are less patient in the study who were operated under local anaesthesia and it might be possible that decision of local anaesthesia was taken after the investigations has been already ordered and patient was too sick to stand the general anaesthesia. So, it is concluded that to study association of type of anaesthesia and total expenditure larger sample size required in both local and general anaesthesia group of the patients.

CONCLUSION

The type of surgery either major or minor is the main determinant of total expenditure as it is directly related to longer stay in the hospital and type of anaesthesia used. Cost reduction in patients undergoing surgery should focus on decreasing hospital stay, operating theatre time and anaesthetic expenditure. Although definite measures can be suggested from the study, further studies on these variables are necessary to optimize cost effectiveness of surgical units.

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