

RESEARCH ARTICLE

Cost of Illness Analysis of Diabetes Mellitus in a Tertiary Care Hospital

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ABSTRACT

Until few decades ago, Diabetes was generally seen as a problem in developed countries. However with changing lifestyle and diet diabetes has emerged as an important public health concern in developing countries. As Diabetes is associated with many microvascular and macrovascular complications. Uncontrolled and untreated Diabetes mellitus is life threatening as well as financial burden. This study is intended to evaluate the affordability of the right medication to the right patient at the right time plays a pivotal role in better patient care. Cost of illness analysis (CIA) is defined as the evaluation and assessment of resource used in treating an illness. It comprises direct cost, indirect cost, intangible cost. Direct cost implies the cost generated by the resources used in treating the disease like expenditure of medical cost, hospital services and drugs. The largest components of medical expenditures are: hospital inpatient care, prescription medications to treat complications of diabetes, anti-diabetic agents and diabetes supplies, physician office visits, nursing/residential facility stays. Whereas Indirect costs include: increased absenteeism, reduced productivity while at work for the employed population, reduced productivity for those not in the labour force, inability to work as a result of disease-related disability and lost productive capacity due to early mortality, care giver cost and QOL.

Key words: Diabetes Mellitus, macrovascular, indirect cost, anti diabetic

INTRODUCTION

Diabetes mellitus is probably one of the oldest diseases known to man. It is a major public health concern. The changing lifestyles, dietary habits have emerged as an important public health problem in the developing world. Contrary to trends in developed countries, where the majority of diabetes are 65 years or older, most diabetics in the south East Asian are between 45 and 64 years of age. [1] The past few decades have seen an explosive hike in the number of diabetics. The chronic nature of diabetes and its devastating complications make it a very costly disease. The longer we have diabetes and the less controlled our blood sugar — the higher the risk of complications. Eventually, diabetes complications may be disabling or even life-threatening. Also the treatment of the complications of Diabetes is an economic burden worldwide. Only optimal control of diabetes disease can mitigate costs of diabetes and complications [2]. In the United States, the total estimated cost of diabetes in 2014 was USD 250

billion as per American Diabetes Association. In order to gather a comprehensive idea on economic burden of Diabetes in India, the present study aimed to estimate the cost of illness.

Cost of Illness Analysis (CIA) is defined as the evaluation and assessment of the 8 resources used in treating an illness. Types of costs and perspectives used in analysis are Direct Cost, Direct economic costs of disease are those generated by the resources used in treating or coping with a disease, including expenditures for medical care and the treatment of the illness (hospital care, physician services, nursing home care, drugs and other medical needs). Indirect Cost Indirect costs consider the potential resources that are lost as a result of a disease. They include the societal costs of morbidity, disability and premature mortality. eg: lost productivity, care giver costs, and quality of life. Intangible Cost Non-financial outcomes of disease and medical care. This study is intended to evaluate the affordability of the right medication

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to the right patient at the right time plays a pivotal role in better patient care. Cost of illness analysis (CIA) is defined as the evaluation and assessment of resource used in treating an illness. It comprises direct cost, indirect cost, intangible cost. Direct cost implies the cost generated by the resources used in treating the disease like expenditure of medical cost, hospital services and drugs. The largest components of medical expenditures are: hospital inpatient care, prescription medications to treat complications of diabetes, anti-diabetic agents and diabetes supplies, physician office visits, nursing/residential facility stays. Whereas Indirect costs include: increased absenteeism, reduced productivity while at work for the employed population, reduced productivity for those not in the labour force, inability to work as a result of disease-related disability and lost productive capacity due to early mortality, care giver cost and QOL. So the present study aimed to determine the average annual direct cost per patient for the management of type 2 DM and its complication.

MATERIALS & METHODS

It is a prospective study where Type II DM patients were included. Whereas renal failure patients, emergency patients with type II DM were excluded. Parameters analyzed were annual medicine cost (ANC), annual laboratory cost (ALC), Annual consultation cost (ACC). Average value of 3 categories was summed up to calculate the total cost per patient per annum. The cost of medications for patients with no complications, 1 complication, 2 complications, 2 or more complications were also calculated by taking the average cost for total study population.

RESULT

100 type II DM patients were enrolled in the study. Out of 100, 58 were males and 42 were females. They were of the age group 65-75 yrs and 75-85 years. Average annual direct cost per patient per annum was found to be Rs 50,000 per annum (.45, 000 -60,000) Where as those with Diabetes with no complications, the cost per annum is Rs 15,000 (12000 – 18000), those with one complication is Rs 30,000 (20000-48000) those with 2 complications Rs 35,000 per annum and more than 2 complications the cost was found to be Rs 65,000 per annum.

Statistical analysis unpaired T test was performed to find out the difference in AMC, ALC, ACC among non complicated group and complicated group.

P Value <0.05 for AMC and ALC

P value, 0.01 for ACC.

Annual Medicine Cost (AMC), Annual Lab Cost (ALC), Annual Consultation Cost (ACC) details of non complicated group are as follows:

- Annual Medicine Cost (AMC) - 6485±987.7 2)
- Annual Lab Cost (ALC) - 4496±334.9 3)
- Annual Consultation Cost (ACC) - 635.2±23.54
- Annual Medicine Cost (AMC), Annual Lab Cost (ALC), Annual Consultation Cost (ACC) details of complicated group are as follows.
 - 1) Annual Medicine Cost (AMC) - 12980±803.4
 - 2) Annual Lab Cost (ALC) - 6060±263.7
 - 3) Annual Consultation Cost (ACC) - 1060±50.10

Table 1 Cost of illness of Diabetes Mellitus

Types of cost	Total cost	% of total
Direct medical cost	12500	25
Hospital care	4200	6
Dispensing cost	120	5
Drug cost	4500	7
Laboratory cost	1800	8
Direct Non medical cost	5000	4.8
Transportation	1000	6.1
Food & accomodation	2000	5.6
Cost of personal facilities	3100	5.6
Payment to paid caregivers	2133	8
Total direct cost	18000	88
Mortality cost	28889	6.8
Cost of permanent disability	1788	1.5
Total Indirect cost	16000	22.6
Total cost of illness	37889	55

Table 2 Complications of Type II Diabetes Mellitus

Complication	Monetary value
Cost of DM patient with no complication	Rs 15,000
Cost of DM patient with one complication	Rs 30,000
Cost of DM patient with two complication	Rs 35,000
Cost of DM patient with two or more complication	Rs 65,000

DISCUSSION

The study was conducted to determine the average per patient annual direct cost spent for the management of type 2 diabetes. In this study the socio-demographic factors such as the education, income, length of stay and the type of complications were found to be influencing the outcome of the diabetes and so the costs for treatment. In the current study (N=100), among the gender wise prevalence there was a male predominance with 58 out of the total 100 patients and only 42 patients were female. These results reciprocates the result of the study conducted by Riewpaiboon A et al in which out of the total 475 study population 354 were females and only 121 patients were 16 males. The total

average direct cost per annum for the management of type 2 diabetes was found to be 38589 rupees in this study. The patients who did not have any complications spent 15512 rupees as average direct cost per annum for their diabetes care, patients having one complication spent 25228 rupees as average direct cost per annum for their diabetes care, patients having two complications spent 30497 rupees as average direct cost per annum for their diabetes care, patients having three complications spent 52607 rupees as average direct cost per annum for diabetes care.

CONCLUSION

Chronic illness like diabetes mellitus decreases health related quality of life of the patient along with economic burden. The present study also showed that the patients with diabetic complications had to incur substantially higher cost. However, much of this cost associated with the disease is preventable through improved diet and exercise, prevention initiatives to reduce the prevalence of diabetes and its co-morbidities and improved care.

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