



A Prospective Study to Assess Cost of Illness in Diabetic Patients of Tertiary Care Hospital

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Abstract

Background: *Diabetes mellitus and its complications are the major cause of morbidity and mortality in India. And this study is for an assessment of economic burden of the disease*

Objective: *This study is to assess the cost of illness in diabetic patients and reduce the economic burden in diabetic patients with complications*

Methods: *A prospective observational study conducted on cost of illness in diabetic patients with complications, and patient data related cost is collected from the patient in duration of 6 months.*

Results: *The study was conducted on 200 patients, The study revealed that the average management cost per diabetic patient without complications were Rs.12460.47 this includes the average total direct medical cost was (91 %), the average direct non Medical Cost was (1%) and the average total Indirect Cost was (8%) compared to those with DM complications, Rs.56356.73, for macrovascular complications Rs.20744.57 for microvascular complications Rs. 17380.4 and infections including other cost was Rs.18231.76. To treat Diabetes with co morbidities was found to be Rs.17344.38, the average total direct medical cost was Rs.15888.37 (90.1%), the average direct non Medical Cost was Rs.129.15(1%) and the average total Indirect Cost was (8.9%).*

Conclusion: *The results of our study quantify that diabetes with macrovascular complications of direct medical costs and investigational cost had more economic burden. So It suggested that a huge amount of resources could be prevented by taking care, initial understanding of the disease and decrease in DM complications through better medical treatment.*

Key words: *cost of illness, health care costs, economic burden, diabetes mellitus*

Introduction

Diabetes mellitus is a group of metabolic diseases characterized by high blood sugar (glucose) levels that result from defects in insulin secretion, or its action. Diabetes Mellitus (DM) is a major cause of disability, morbidity and mortality worldwide. In addition, the economic burden on patients and society in the form of direct and indirect costs is enormous. Diabetes is a common chronic disease in nearly all countries representing 130 countries. In 2014, 387 million people had diabetes; this number is expected to rise to 592 million by 2035. The greatest number of people with diabetes is between 40 to 59 years of age.

Causes of T2DM

T2DM as a common and complex disease has been characterized by the following

causes: Obesity, Abdominal adiposity

Complications of Diabetes: The burden of diabetes is to a large extent the consequence of Macrovascular and Microvascular complications of the disease

Global perspective:

Diabetes exerts a heavy economic burden on society. This burden is related to health system costs incurred by society in managing the disease, indirect costs resulting from productivity losses due to patient disability and premature mortality, time spent by family members accompanying patients when seeking care, and intangible costs.

Pharmacoeconomics

Definition:

It is the description and analysis of the expenses and consequences of Pharmaceutical products and services and their impact on individual health care systems and society.

Cost-Evaluation Methods: Cost Minimization Analysis, Cost Benefit Analysis, Cost Effectiveness Analysis, Cost Utility Analysis, Cost of Illness Analysis.

Cost of Illness Analysis:

It is defined as an evaluation, identification and estimation of the overall cost of a particular disease for a defined population. The method of

determining the cost of illness is as follows, direct costs, indirect costs, intangible costs.

COST:

Cost is defined as the value of the resources consumed by a program or drug therapy of interest. There are three types of costs associated with drugs in a health care system.

Direct costs:

Acquisition cost of the drug, Transportation costs, Shipping, Insurance, Inventory carrying cost, Supply personnel salary, Storage facilities, including warehouse, Equipment and supplies for administration, etc.

Other direct costs: Treating adverse drug reactions, Inpatient and outpatient treatment of poor response to drug therapy, Emergency room use, Hospital costs, Laboratory services.

Indirect costs: Cost of illness to the patient, Lost time from work

Intangible cost: Quality of life

Methodology and Materials

Study Site: The Present Study was conducted at, at Narayana Hrudalaya Hospital

Study Design: Prospective Observational Study

Study Duration: Six months (September 2014 – February 2015)

Study Criteria: Either sex, Age greater than 18 years, Patient who stayed in hospital for a minimum of days, Patients who were willing to participate in the study.

Exclusion Criteria: Age less than 18 years, Out patients, Pregnant women, Patients who were not willing to participate in the study.

Study Materials: Patients case notes, Interviewing Healthcare Professionals, Any relevant sources.

Study Procedure:

A Prospective observational study was carried out in Diabetic patients. The patients were identified during ward rounds and by regular Case record reviews during study period. The enrolled patients from the day of admission till the day of discharge and the relevant study data including Total direct, Direct non medical, indirect costs was

documented in Case record form. The data observed was analyzed.

Results

1.Socio demographic details:

1.1. Gender Wise Distribution of the Patients:

A total of 200 patients were enrolled during the study period out of which most of the patients were female patients 141 (70.5%) followed by male patients 59 (29.5%)

1.2.Age Wise Distribution of the Patients

Out of 200 patients, most of the patients were in the age group of 51-60 years 62 (31%) followed by 41-50 years 51 (25.5%) and other age groups were summarized

1.3. Duration of Diabetes Mellitus

Out of 200 patients, 89 (59.34%) patients were diagnosed 1-5 years back followed by 40(26.66%) patients

6-10 years back and others were summarized

1.4. Social Habits

Out of 200 patients, most of the patients were alcoholics 23 (11.5) followed by smokers 8 (4%), pan chewer 1 (0.5%) and others

1.5. Length of Hospital Stay

Out of 200 patients, most of the patients were stayed in the range of 2-5 Days 106 (53%) followed by 6-9 day 82 (41%) and others were summarized in Table 1

Table:1 Length of Hospital Stay

Length of Stay (Days)	Number of Patients (%)
2-5	106 (53)
6-9	82 (41)
10-13	11 (5.5)
>13	1 (0.5)

1.6. Co-Morbidities

Out of 200 patients, most of the patients has HTN 83 (41.5%) followed by Renal failure 13 (6.5%) Co- Morbidities are summarized

1.7.Body Mass Index (B.M.I)

Out of 200 patients, most of the patients were Over Weight 76 (38%) followed by Obese 64 (32%) and others were summarized and figure no.1

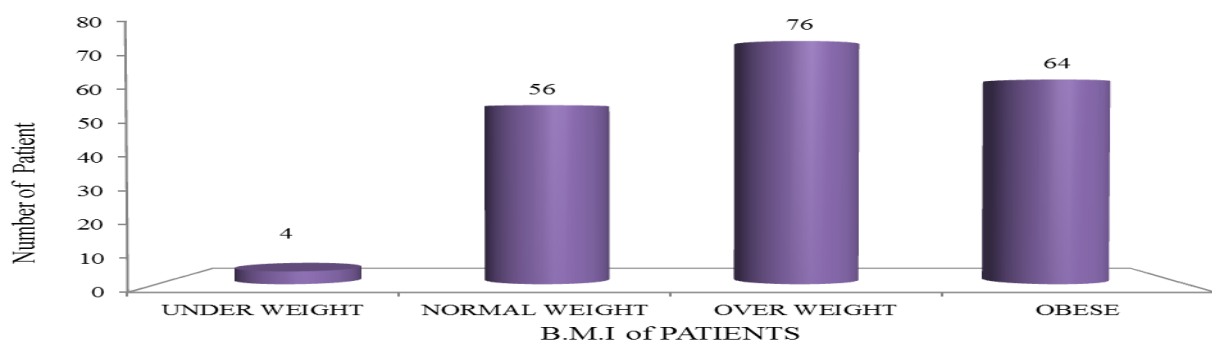


Figure: 1.B.M.I

1.8.Occupational Status:

Out of 200 patients, most of the patients were house wives 127 (63.5%) followed by Employee 28(14%) and other Occupational Status of the patients was summarized in figure2

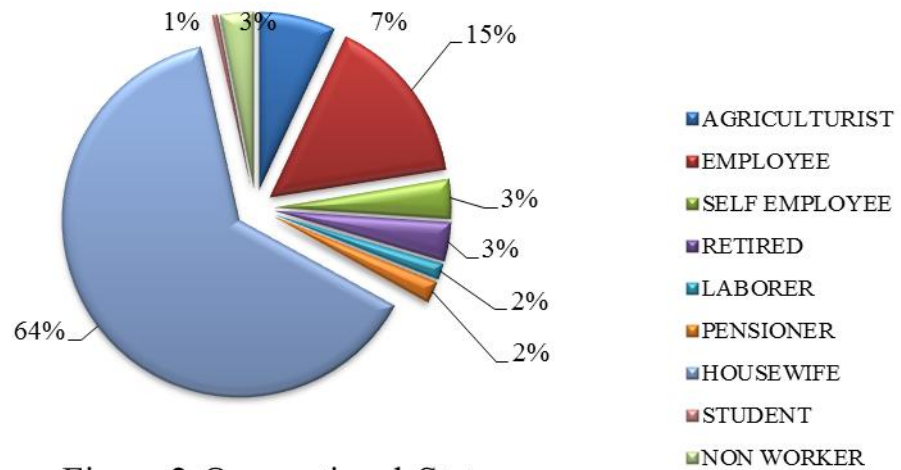


Figure:2 Occupational Status

2.TotalCost of Diabetes

The average total cost spent by patient to treat the Diabetes was found to be Rs.12460.47 the average

total direct medical cost was Rs.11348.22, average total non medicalcost was Rs. 96.42 and the average total Indirect Cost was Rs.1015.83in figure 3

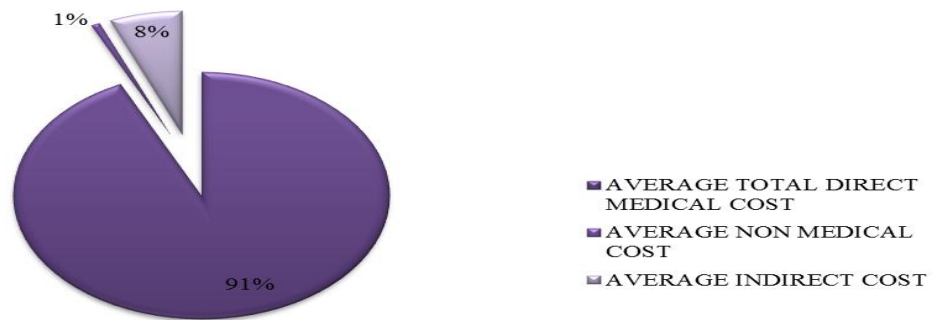


Figure:3 Total Cost of DM

2.1. Total Cost of Diabetes with Co-Morbidities:

Out of 200 patients, the average total cost spent by patient to treat the Diabetes with co morbidities was found to be Rs.17344.38, the average total direct medical cost was Rs.15888.36, the average direct non Medical Cost was Rs. 129.15 and the average total Indirect Cost was Rs.1326.87

2.2. Total Direct Medical Cost:

The Total average Direct Medical Cost spent by patient to treat the Diabetes with co morbidities was Rs. 15895.18. The Total Direct Medical Cost includes the Cost of Medication, Cost of Investigation, cost of consultation and Cost of Hospitalization was summarized in table 2 & figure 4

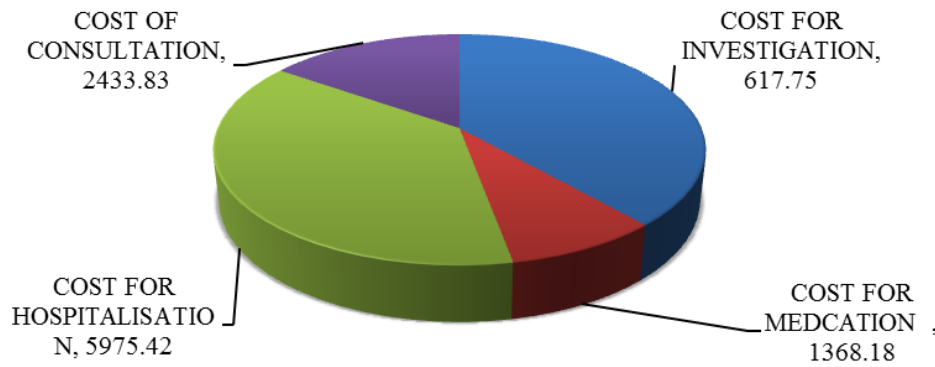


Figure: 4 Direct Medical Cost

Table:2 Total Direct Medical Cost

Components of Cost	Costs (INR)
Cost for Investigation	6117.75
Cost for Medication	1368.18
Cost of Hospitalization	5975.42

2.3.Age Vs Cost (INR):

Out of the 200 Patients most of the patients in the age group of 61-70 years were found to has more economic burden when compared to others and individual costs are summarized& cost compared

2.4.Duration of Diabetes Vs Cost (INR):

Out of 200 the newly diagnosed (<1year) were found to have more economic burden followed by the patients diagnosed 1-5 are summarized

Table:4 Number of Co- Morbidities Vs Cost (INR)

No.Co-Morbidities (patients)	Direct Medical Cost(INR)	Direct Non MedicalCost(INR)	Indirectcost (INR)	Total Cost(INR)
0 (14)	11348.22	96.42	1015.83	12460.47
1(118)	15003.10	127.92	1152.97	16283.99
2 (60)	18080.98	133.3	1763.62	19977.9
3 (8)	20446.44	173125	1902.94	195474.3

2.8.Occupation Vs Cost (INR):

Out of 200 patients, the patients with Employers as their occupation found to have more economic

2.5.Length of the Hospital Stay Vs Cost (INR):

Out of 200 patients, who stayed for > 13 days in the hospital found to have more economic burden and followed by the patients stayed 10-13 days and the individual costs are summarized

2.6.Body Mass Index Vs Cost (INR):

Out of 200 Patients, the economic burden is more for the Obese patients followed by over weighed patients and individual cost are summarized & Total cost compared

2.7.Co- Morbidities Vs Cost (INR):

Out of 200 Patients, the patients with 3 Co morbidities found to has more economic burden and followed by 2 co morbidities and all other cost are summarized in Table 4

burden than others and individual cost are summarized& Total cost compared

2.9.Complications Vs Cost (INR)

Out of 200 patients, the patients who bearing macro vascular complications were found to have

more economic burden when compared to others and individual cost are summarized in Table 3 and Figure 5

Complications Vs Total Cost:

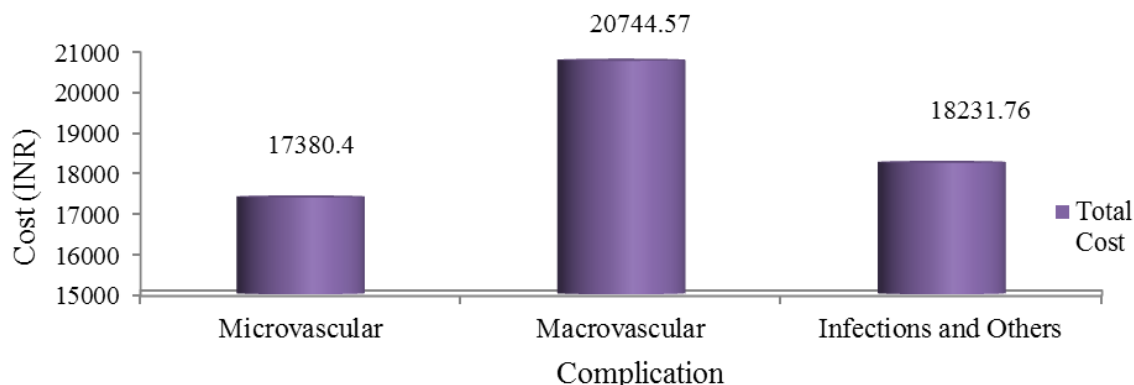


Figure 5 :Complications Vs Total Cost

Table:3 Complications Vs Cost

Complication	Direct Medical Cost(INR)	Direct Non Medical Cost (INR)	Indirect cost (INR)	Total Cost (INR)
Microvascular	16104.34	125.36	1150.7	17380.4
Macrovascular	18981.54	136.62	136.62	20744.57
Infections and Others	15938.32	147.61	147.61	18231.76

Discussion:

This is the study assessing the costs of diabetes with co-morbidities. The study revealed that the average cost per diabetic patient without complications were Rs.12460.47 this includes the average total direct medical cost was (91 %), the average direct non Medical Cost was (1 %) and the average total Indirect Cost was (8 %) compared to for those with DM complications Rs.56356.73 for macrovascular Rs.20744.57 for microvascular Rs.17380.4 and infections and including others cost was Rs.18231.76. when compared to F.Henriksson et al., Sweden patients with both macro and microvascular complication. To treat Diabetes with co morbidities was found

to be Rs.17344.38, the average total direct medical cost was (90.1%), the average direct non Medical Cost was (1%) and the average total Indirect Cost was (8.9%). When compared with S.Grover et al., the Direct cost was 68%, Indirect cost 28.76% and Providing cost 2.8% .

Conclusions

In our study we concluded that the female patients has more burden of DM than male. The age group of 61-70 years (Rs.19749.06) has more cost than others, the newly diagnosed (<1year) patients (Rs.191344.42), the patients who stayed for >13 days in the hospital (Rs.44263.83), the patients with three co morbidities (Rs.195474.3), the

patients with Employees as their occupation Rs.24192.78 .

It is suggested that a huge amount of resources could be prevented by taking care, initial understanding of the disease and decrease in DM Co morbidities and complications through better medical treatment .If prevention cost can be kept sufficiently low, DM prevention may lead to reduction in long term medical care.

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