

SHORT ARTICLE

Expenditure pattern on diabetes care: A Community based longitudinal study in resettlement colony of East Delhi

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Abstract

Background: Diabetes mellitus is one of the expensive diseases in the world. The cost of care in diabetes is high mainly because of its chronic nature and complications. Moreover, it affects economically productive section of society. But studies on economic impact of diabetes are very limited in India. The present aims to estimate the annual out of pocket expenditure of diabetic care among diabetics living in an underprivileged community of East Delhi. **Methodology:** A community based one year longitudinal study was conducted in Kalyanpuri area of East Delhi. All the diabetes patients (consecutive sampling) aged more than 25 years and who were the permanent residents of Kalyanpuri, attending the Diabetic Clinic of Lal Bahadur Shastri Hospital in November-December 2014 were selected for the study. A pre-tested semi-structured interview schedule was used as study tool. Each subject was followed up 3 monthly from January 2015-December 2015. Both direct and indirect expenditure were estimated. **Results:** Total 153 study subjects were selected out of which 2 migrated and 1 died. So, data from 150 study subjects were collected and analyzed. The Mean and median annual expenditure was Rs. 8,958 ± 11,704 and Rs. 4,443 respectively. The mean per capita annual direct expenditure was estimated to be Rs 6,821 ± 9,832 and mean annual indirect expenditure was Rs. 2,137 ± 5,622. Inpatient treatment and medicine are two major heads of expenditure. **Conclusion:** Expenditure on diabetes care among diabetes patients living in underprivileged community was considerably high despite of having well-functioning government hospital in vicinity of study area.

Keywords

Expenditure; Diabetes

Introduction

Diabetes is one of the major lifestyle diseases in the world. Globally around 382 million people at a prevalence of 8.3% suffered from diabetes recently and this number is expected to reach 592 million in less than 25 years. (1,2) In India too, the rising trend of diabetes is a big concern with more than 65.1

million people lived with diabetes in the year 2013 and will possibly reach 109 million by the year 2035. (3) Diabetes is a chronic disease and if not controlled often leads to multi organ involvement with various complications.

High cost of care and loss of productivity have made diabetes mellitus one of the expensive diseases. (4)

Moreover the ignorance of the of people of the disease and its course along with poor health seeking behavior have been major attributing factor for high cost of care in developing countries including India. As health care resources in India are limited and diabetes because of its complication requires higher portion of resource allocation, estimation of cost of diabetes is of utmost importance for better planning and implementation of health services.

Aim & Objective

To estimate the annual out of pocket expenditure of diabetic care among diabetics living in an underprivileged community of East Delhi.

Material & Methods

The study was done at Kalyanpuri, a resettlement colony of East Delhi in the year 2014-15. It was a community based one year follow up study. The study was carried out from November 2014 to December 2015. During first two months enrolment of the study subjects were made from the records of diabetic clinic of Lal Bahadur Shastri hospital which is a local tertiary care hospital. All the diabetes patients (consecutive sampling) aged more than 25 years and who were permanent resident of Kalyanpuri, attending the Diabetic Clinic of Lal Bahadur Shastri Hospital in November-December 2014 were selected for the study. After obtaining the personal details of the patients from the diabetic clinic house visits were made for the selected subjects. Patients of gestational diabetes and those who did not give consent for study were excluded. Based on inclusion criteria, 153 subjects were enrolled and out of which 1 died and 2 migrated out and finally complete data of 150 patients were analyzed. Proper ethical approval was taken from local Ethical body. A written consent from literate and thumb impression from illiterate subjects were taken after informing them the purpose of the study.

A semi-structured, interview schedule was designed and pretested before use. Data was collected by house to house visits to residence of diabetic patients. Each subject was followed up 3 monthly from January 2015-December 2015. In the first visit a small diary was provided to the subjects to record the relevant information in terms of cost of medicine, hospitalization, investigation etc associated to diabetes. All the prescriptions and bills were told to keep. The major outcome variables in this study were annual direct and indirect

expenditure per diabetic patient and proportion of family income spent on diabetes care.

Expenditure on diabetes care includes both direct and indirect expenditure. In direct expenditure, we included expenses on medicine, doctor's fees, investigation, inpatient care (in case of hospitalization), transportation and diet modification. Loss of wages was considered as indirect expenditure

SPSS version 12 was used for entering and analyzing the data. Mean, median and standard deviation were calculated for quantitative data. Proportions are calculated for qualitative data

Results

Out of 150 subjects studied 45(30 %) were male and 105 (70%) female. More than half of subjects i.e.63.5% belonged to age group 45-65 years. Overall mean age of study subjects was 53 ± 10 years. The mean age for men was 53 ± 11 years and for women 53 ± 9 years. ([Table 1](#))

More than half of the subjects (59.3%) were Hindu, followed by 34.7% Sikh. Almost half of the subjects i.e. 49.2% were illiterate. Illiteracy rate was more in female (64.8%) as compared to male (13.3%). Maximum study subjects i.e. 73(48.7%) belonged to upper lower socio-economic status followed by 71(47.3%) to middle and 6 (4%) to upper socioeconomic class.

A total of Rs. 13, 43,710 was spent on diabetes care by the study subjects over a period of one year. The Mean and median annual expenditure was Rs. 8,958 \pm 11,704 and Rs. 4,443 respectively. There were 21(14%) subjects who spent more than Rs.20, 000 annually on diabetes care. Out of total expenditure of Rs. 13, 43,710, direct expenditure that included expenditure on medical and non-medical expenses came out to be Rs.10, 23,155. Total indirect expenditure was found Rs. 3, 20,555. The mean per capita annual direct expenditure was estimated to be Rs 6,821 \pm 9,832 and mean annual indirect expenditure was Rs. 2,137 \pm 5,622. ([Table 2](#))

Major proportion of direct expenditure i.e. 89.3% was spent on medical expenses. Inpatient care and medicine were the two major heads (36% and 31% respectively) of direct medical expenses. Whereas, non-medical expenses contributed 10.74% (7.3% on diet and 3.4% on transportation) ([Table 3](#))

Majority of subjects (66.7%) spent <5% of their family income on diabetes care However there were 14 subjects (9.3%) who spent more than 20 % of

family income on diabetes care (Table 4) and all of them belonged to socio-economically underprivileged i.e. upper lower and lower middle class.

Discussion

Studies on cost of diabetic care are mostly cross sectional. It is difficult to visualize exact pattern of expenditure on diabetes from such studies. The present study is a sincere effort to overcome such limitation.

There is variation on cost of diabetic care between the present and previous studies, but a major concern, common across the studies was the financial burden of diabetes care in spite of free treatment in government setups. While compared to other studies the per capita annual cost of diabetes care was lesser (Rs 8,958) in present study probably because of presence of a well functional government secondary care hospital having diabetic clinic in the vicinity of study area.

In our study, more than three fourth of the annual expenditure was direct cost which is mainly met out of pocket. This is a matter of concern as out of pocket expenditure to such high extent bound to worsen the financial burden of poor diabetics in developing countries like India. Similar finding was reported by Grover *et al* (5) and Akari *et al* (6) in India and other global studies. (7,8,9)

The inpatient treatment and medicines were the major components in direct cost in present study. Though basic drugs like anti-diabetics, antihypertensive, anti-lipid etc. are claimed to be available free of cost in Government settings, lack of supply of medicines becomes a prime reason for purchasing from outside time to time. Small proportion of patients also preferred buying the medicine from outside to avoid delay in long queue in diabetic clinic of Government hospital. Similar finding has also been reported various studies in India. (5,6,10,11).

While the curative care of diabetes needs huge financial resources the preventive measures that includes primordial prevention in early childhood, screening in adults for risk factors of diabetes and screening for early detection and control blood sugar level may be cost effective.

In present study 33% of the diabetics were found to spend more than 5% and around 10% (n-14) subjects spent more than 20% of their family income on diabetes care only which may be matter of great

challenge for policy makers. WHO4 has already raised concern on the financial burden in diabetes as it indicated that in low income Indian families with an adult having diabetes, as much as 25% of family income was spent on diabetic care. For implementing effective policy and strategies the exact pattern of expenditure in terms of various socio-demographic and clinical profiles is important to explore.

Authors Contribution

All authors have contributed equally in this study.

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Tables

TABLE 1 AGE AND GENDER-WISE DISTRIBUTION OF STUDY SUBJECTS

Age (in years)	Male Frequency (%)	Female Frequency (%)	Total (%)
25-35	0(0.0)	1(0.9)	1(0.7)
35-45	10(22.2)	18(17.2)	28(18.7)
45-55	11(24.4)	32(30.5)	43(28.7)
55-65	17(37.8)	35(33.3)	52(34.6)
65-75	7(15.6)	19(18.1)	26(17.3)
Total	45(30.0)	105(70.0)	150(100.0)
Mean age(SD)	53.04±11 years	53.22±9.6 years	53.17 ± 10 years

TABLE 2 ANNUAL EXPENDITURE AMONG STUDY SUBJECTS ON DIABETIC CARE

Expenditure (Rs)	Frequency (%)	Total expenditure in Rs. (%)	Mean annual expenditure ±SD	Median annual expenditure
<1000	16(10.7)	9,136(0.7)	571±285	546
1000-5000	61(40.7)	1,66,171(12.4)	2,724 ±9,87	2,725
5000-10000	32(21.3)	2,12,561(15.8)	6,642±1,381	6,430
10000-20000	20(13.3)	2,48,434(18.5)	12,421 ± 2,294	11,504
>20000	21(14.0)	7,07,408(52.6)	3,36,86 ± 13,124	28,474
Total	150(100.0)	13,43,710(100.0)	8,958 ± 11,704	4,443

TABLE 3 COMPONENTS OF ANNUAL DIRECT EXPENDITURE

Components of direct expenditure	Expenditure in Rs.(%)	Mean ± SD
Direct Medical expenditure		
Registration	16,020(1.6)	106± 272
Medicine	3,26,744(31.9)	2,178± 3,015
Investigation	84,513(8.3)	563± 764
Inpatient	3,72,392(36.4)	2,482± 8,304
Special treatment*	1,13,630(11.1)	757± 4,309
Direct non-medical expenditure		
Transportation	34,766(3.4)	231± 483
Diet	75,090(7.3)	500±1,126
Total	10,23,155(100.0)	6,821±9,832

*Special treatment included laser, cataract surgery and dialysis

TABLE 4 SUBJECTS BASED ON PROPORTION OF FAMILY INCOME SPENT ON DIABETES

Proportion of family income spent on diabetes	Frequency of subjects	%
<5%	100	66.7
5-10%	24	16.0
10-20%	12	8.0
>20%	14	9.3
Total	150	100.0