

COST OF TYPE 2 DIABETES IN URBAN INDIAN POPULATION

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BACKGROUND & OBJECTIVES

- Growing evidence from developing countries emphasises the major burden of type 2 diabetes (T2DM) in terms of healthcare resource use and costs of diabetes care.
- Previously published data in 2009 from the International Diabetes Management Practice Study (IDMPS) study showed the high resource consumption among patients with T2DM from Asia, Latin America, the Middle East and Africa.[1]
- Epidemiological studies in India show increasing prevalence of T2DM in urban areas. This analysis aims to estimate the cost of management of T2DM and its complications in urban population in India in 2011 - 2012.

METHODS

- The IDMPS is an ongoing international, multicentre, observational study, which has been conducted for the past 10 years in developing countries. This analysis included cross-sectional data from 731 adults with T2DM from urban areas in India.
- Diabetes-related healthcare resource use items included *monitoring* (blood lipid, blood pressure (BP) and HbA1c tests and blood glucose self-monitoring), *screening for complications* (cardiovascular diseases, eyes, nerve damages, kidney damages and foot), *visits* (GP, specialists and educator), *medications* (insulin, non-insulin diabetes-related medications and medications for complications, control of BP and lipids), *hospitalisations and emergency room visits* due to complications. Additionally, *productivity losses* (unemployment due to diabetes and number of sick leaves per year) were included.
- Unit costs of medications, tests and visits were obtained from published sources. Mean annual cost per patient was calculated by multiplying the unit costs by the mean annual use the healthcare use items from the IDMPS. The impact of complications on the mean annual cost per patient was assessed

RESULTS

- 731 patients were included in the analysis, 55.5% were males; mean (\pm SD) age was 54.1 (10.6); mean duration (\pm SD) of T2DM was 9.2 (6.5) years (Table 1).
- Details of monitoring and outpatient care are shown in Table 2.

Table 1. Demographic and clinical data by type of treatment

	OAD alone N=500	Insulin alone N=31	OAD + Insulin N=196	Total N=731
Age (years), mean \pm SD	53.7 \pm 10.6	54.2 \pm 15.1	55.0 \pm 9.2	54.1 \pm 10.6
Gender, n (%) of males	274 (54.8%)	18 (58.1%)	113 (57.7%)	406 (55.5%)
BMI, kg/m ²	26.9 \pm 4.5	26.3 \pm 4.2	27.3 \pm 4.5	27.0 \pm 4.5
Time since diagnosis (years), mean \pm SD	7.8 \pm 5.8	12.1 \pm 8.7	12.3 \pm 6.8	9.2 \pm 6.5
Patients with diabetes family history (affecting 2 or 3 generations), n (%)	220 (44.0%)	17 (54.8%)	85 (43.4%)	324 (44.3%)
Patients with at least one complication, n (%)	184 (36.8%)	24 (77.4%)	98 (50.0%)	308 (42.1%)

Table 2. Monitoring and outpatient care

Screening, visits and tests	N (%) of screened patients (12m)	Mean annual number per patient
Cardiovascular (N=588)	498 (84.7)	1.43
Eyes (N=558)	444 (79.6)	1.25
Nerve damage (N=544)	398 (73.2)	1.33
Kidney damage (N=596)	499 (83.7)	1.39
Foot examinations (N=567)	458 (80.8)	1.45
SMBG testing (per day) (N=719)	294 (40.9)	1.66
Blood lipid tests (N=610)	543 (89.0)	1.51
Blood pressure tests (N=383)	359 (93.7)	2.74
HbA1c tests (N=699)	607 (86.8)	1.80
GP visits (N=730)	611 (83.7)	6.64
Specialist visits (N=606)	250 (41.3)	3.04
Educator visit (N=724)	178 (24.6)	1.00

SMBG: self-monitoring blood glucose

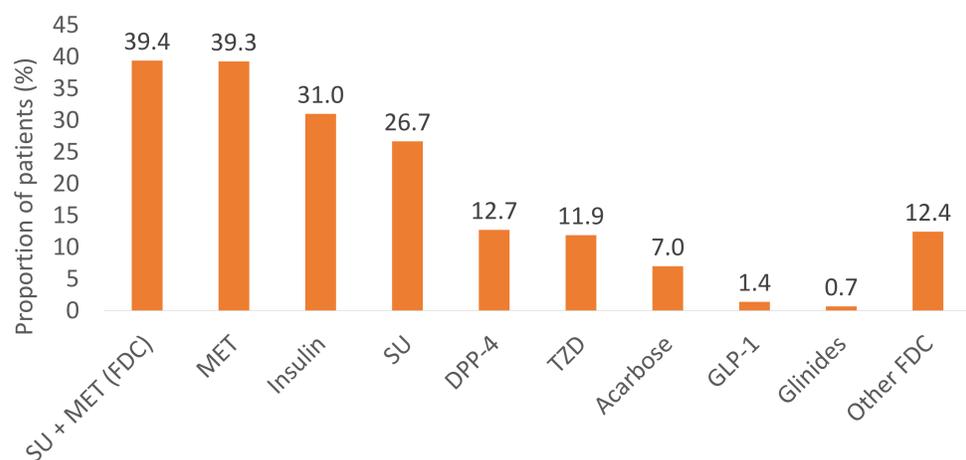
- 42.1% of patients had at least one complication, sensory neuropathy (23.8%), hypoglycaemia (19.8%) and retinopathy (11.1%) being most common (Table 3).
- 7.0% were hospitalised due to diabetes or complications and 2.3% had at least one emergency room visit due to diabetes or complications (Table 3).
- Unemployment due to diabetes was reported in 3.4% of patients; 5.5% had at least one sick leave due to diabetes or complications (5.8 sick days in average in the past 3 months).
- 39.4% of patients took sulfonylureas + metformin as a fixed dose combination (FDC), 39.3% were on metformin outside a FDC, 31.0% were treated with insulin and 26.7% with sulfonylureas (outside FDC) (Figure 1).
- Of all patients 10.8% of patients were treated with basal alone, 14.0% with premix and 6.2% with combinations of prandial, basal or premix.

Table 3. Complications and hospitalisations

Diabetes-related complications	N (%) with complication - N=731	N (%) hospitalised due to complication (3m) - N=731
All complications	308 (42.1)	51 (7.0)
Hypoglycaemia	145 (19.8)	27 (3.7)
Retinopathy	81 (11.1)	26 (3.6)
Sensory neuropathy	174 (23.8)	27 (3.7)
Microalbuminuria	89 (12.2)	-
Proteinuria	45 (6.2)	-
Dialysis	1 (0.1)	26 (3.6)
Amputation	3 (0.4)	28 (3.8)*
Foot ulcer	23 (3.1)	-
Angina	14 (1.9)	-
MI/ACS	30 (4.1)	28 (3.8)
Heart failure	6 (0.8)	27(3.7)
Stroke	5 (0.7)	28 (3.8)
PVD	8 (1.1)	26 (3.6)
Revascularisation	25 (3.4)	-

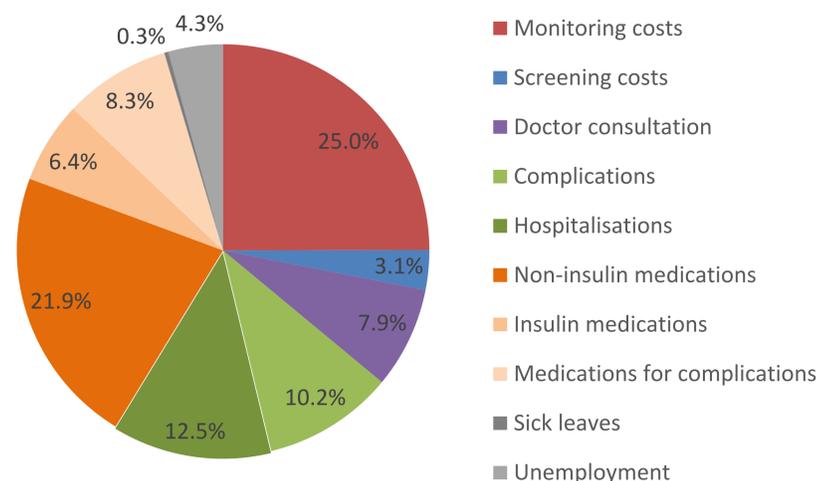
*Foot ulcers and amputations; ACS: acute coronary syndrome; GP: general practitioner; MI: Myocardial infarction; PVD: peripheral vascular disease

Figure 1. Medication use



SU: Sulfonylureas, TZD: Thiazolidinedione, MET: Metformin, FDC: Fixed Dose Combinations.

Figure 2. Total costs distribution



- Overall, mean annual cost per patient was estimated at 41,910 INR (€563) [2]. Mean annual cost was 56,516 INR (€760) for patients with complications and 31,274 INR (€420) for patients without complications.
- As a proportion of total costs, monitoring, doctor consultations and screening for complications cumulatively accounted for 36.0%; diabetes-related treatments - 28.3%; management of comorbidities and hospitalisations - 22.7%; unemployment due to diabetes - 4.3% (Figure 2).

CONCLUSIONS

Our findings suggest a significant economic burden of T2DM and its complications in an urban population in India. The results from this analysis of the IDMPS show very high mean annual cost per patient and highlight substantial costs associated with the presence of diabetes complications. Patients with such complications had nearly twice higher mean annual costs compared with those without. This clearly highlights the need for more efforts in prevention of complications in order to reduce not only the clinical but also the economic burden of T2DM in India.

ACKNOWLEDGEMENT

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REFERENCES

1. Ringborg, A., et al. International journal of clinical practice, 2009. 63(7): p. 997-1007.
2. 1 INR= 0.013444 € (04/10/2016)