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ADA 2021
June 25-29
Virtual Meeting

Diabetes Complications Among Patients from Metropolitan Versus Non-Metropolitan Cities in India: 1 Year Results of LANDMARC

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PLAIN LANGUAGE SUMMARY

- There is a paucity of information on diabetes-related complications in patients with type 2 diabetes (T2D) in Indian metropolitan and non-metropolitan cities. The LongitudinAl Nationwide stuDy on Management And Real-world outComes of diabetes in India (LANDMARC) was initiated in 6236 people with T2D to primarily assess real-world prevalence and other trends during disease progression.
- Here, we attempt to identify the trends of diabetes-related (macrovascular [involving large blood vessels like arteries or veins] and microvascular [involving mini blood vessels like venules or capillaries]) problems (complications) in patients from Indian metropolitan and non-metropolitan cities over a period of 1-year.
- At the end of 1-year, patients from non-metropolitan cities had higher microvascular complications (19.1%) as compared to patients from metropolitan cities (10.9%). Nerve damage (neuropathy) was the most commonly observed microvascular complication in both metropolitan and non-metropolitan cities. Although, there was no difference in majority of macrovascular complications, acute coronary syndrome (heart conditions such as heart attack and severe chest pain, mainly caused by blocked blood supply to parts of the heart) was higher number in patients from non-metropolitan cities.
- Overall, patients from non-metropolitan cities may have higher diabetes-related complications, particularly microvascular complications compared to metropolitan cities.

INTRODUCTION

- Macro- and micro-vascular complications are common in patients with uncontrolled type 2 diabetes mellitus (T2D).[1]
- India has the second highest diabetes disease burden in the world and evidence suggests that diabetes prevalence is comparatively higher in urban (10-16%) population than rural population (5-8%) of India.[2,3]
- Data on diabetes-related complications in patients with T2D from Indian metropolitan and non-metropolitan cities is unavailable.
- Hence, as a subsidiary analysis from the LANDMARC study, micro- and macro-vascular complications were evaluated in cities across India.[4]

OBJECTIVE

To identify macro- and micro-vascular complications in patients with T2D from Indian metropolitan and non-metropolitan cities.

METHODS

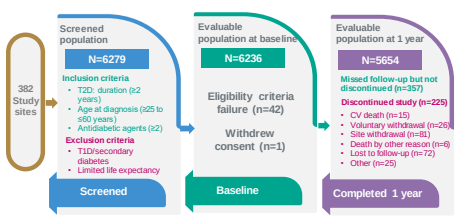
Study Design[4]

- The multicenter, prospective observational study design of LANDMARC (CTRI/2017/05/008452) mirrors the real-life diabetes management pattern in India.
- Patients aged 25–60 years who had diabetes for ≥2 years and were receiving ≥2 antihyperglycemic medications (with/without glycemic control) were enrolled in the study.
- The 3-year evaluation period is divided into 7 visits of 6 months interval.
- The macro- and micro-vascular complications reported in this evaluation (metropolitan versus non-metropolitan cities) are after 1-year (±25 days) follow-up period.
- Metropolitan cities include Bengaluru, Chennai, Delhi, Hyderabad, Kolkata, and Mumbai.

Statistical Consideration

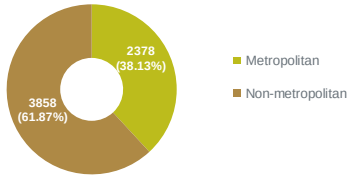
- The minimum sample size required for this study was estimated to be 4387 with a 2-sided 99% confidence interval, assuming that the percentage of patients with composite incidence of non-fatal myocardial infarction, stroke and cardiovascular death after 3-years would be 3%.
- The statistical tests were conducted at 5% significance level.

Figure 1: Patient disposition[4]



CV, cardiovascular; T1D, type 1 diabetes mellitus; T2D, type 2 diabetes mellitus.

Figure 2: Summary of patient distribution

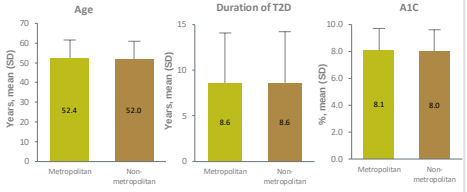


RESULTS

Patient disposition

- A total of 6279 patients were screened from 382 study sites across India; of which 6236 patients were enrolled and 5654 patients completed 1-year follow-up (Figure 1).
- Of the total 6236 patients, 2378 and 3858 were from metropolitan and non-metropolitan cities, respectively (Figure 2).

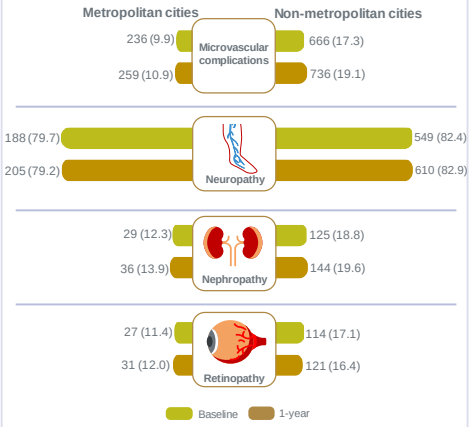
Figure 3: Demographics and baseline characteristics



A1C, hemoglobin A1c; SD, standard deviation; T2DM, type 2 diabetes mellitus.

- Age of participants, duration of T2D and baseline A1C of evaluable patients were comparable across metropolitan and non-metropolitan cities (Figure 3).
- At 1-year, microvascular complications were significantly higher in patients from non-metropolitan cities than metropolitan cities (19.1% vs. 10.9%; P<0.0001) (Figure 4); macrovascular complications were similar (Figure 5).

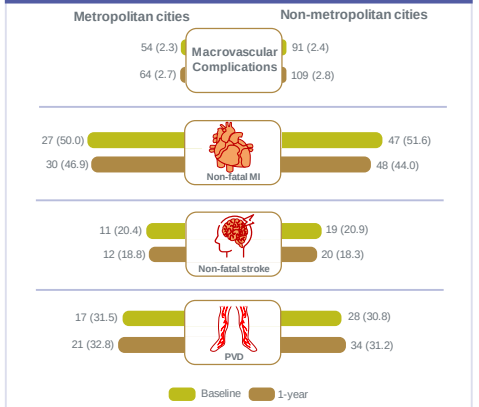
Figure 4: Microvascular complications at baseline and 1-year



Data presented as n (%).

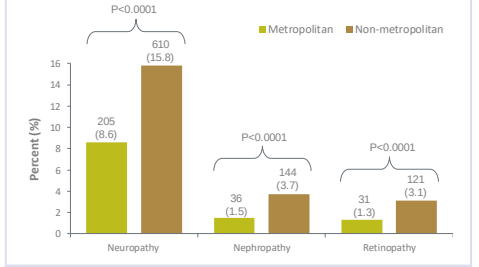
- Microvascular complications (neuropathy, nephropathy, and retinopathy) were significantly higher in patients from non-metropolitan cities as compared to those from metropolitan cities (P<0.0001 for all) (Figure 6).
- Among macrovascular complications, acute coronary syndrome was significantly higher in patients from non-metropolitan cities compared to those from metropolitan cities (P=0.0169) (Figure 7).

Figure 5: Macrovascular complications at baseline and 1-year



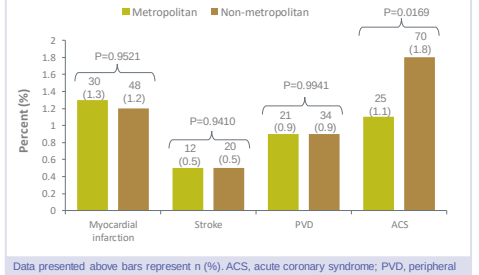
Data presented as n (%). MI, myocardial infarction; PVD, peripheral vascular disease.

Figure 6: Comparison of microvascular complications between metropolitan and non-metropolitan cities



Data presented above bars represent n (%).

Figure 7: Comparison of macrovascular complications between metropolitan and non-metropolitan cities



Data presented above bars represent n (%). ACS, acute coronary syndrome; PVD, peripheral vascular disease.

DISCUSSION

- To date, a paucity of real-world data exists regarding the trends of diabetes-related complications in metropolitan and non-metropolitan cities across India.
- This is the first of its kind evidence from India in a longitudinal study reporting trends of diabetes-related complications between metropolitan and non-metropolitan cities which can help to better understand disease associated complications and their progression patterns over the period of 1-year across India.
- Neuropathy was the most common diabetes complication in both metropolitan and non-metropolitan cities.
- All microvascular complications were higher in non-metropolitan cities.
- Although majority of macrovascular complications were comparable between metropolitan and non-metropolitan cities, acute coronary syndrome was higher in patients from non-metropolitan cities.

CONCLUSIONS

- **Patients with T2D from non-metropolitan cities in India may have higher diabetes related complications, particularly microvascular complications compared to metropolitan cities.**
- **Neuropathy is the most common diabetes complication in both metropolitan and non-metropolitan cities.**
- **Results show patterns of disease progression among patients with T2D and may aid in understanding different trends of diabetes-associated complications across metropolitan and non-metropolitan cities across India.**

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Disclosures: AKD, AM, AGU, and NR received honoraria from Sanofi and other pharmaceutical companies. KMPK is on the advisory board of Sanofi and received honorarium for his talks. SJ received speaker/advisory/research grants from Abbott, Astrazeneca, Biocon, Boehringer Ingelheim, Eli Lilly, Franco Indian, Glenmark, Lupin, Marico, MSD, Novartis, Novo Nordisk, Roche, Sanofi, Serdia, Twinhealth, and Zydus. SK received honoraria/ speaker fees from Eli Lilly, Novo Nordisk, and Sanofi. HT received honoraria from MSD, Novartis, Sanofi and from other companies for advice and lectures. BS received honorarium from Aventis, Novo Nordisk, Eli Lilly, Boehringer Ingelheim (BI), and MSD. SC received honoraria/grants from Biocon, BI, Intas, Novartis, Sanofi, and Serdia. SKW has nothing to declare. AHZ received honoraria from Novo Nordisk, Eli Lilly, Johnson & Johnson, AstraZeneca, BI, and Sanofi. RG, SK, AN, SM, SKM, VS, DC, and CT are Sanofi employees and may hold stock options in the company.

FUNDING: This study was sponsored by Sanofi.

Acknowledgement: Writing and poster development assistance was provided by Madhulika Malode (Sqarona Medical Communications LLP, Mumbai; paid for by Sanofi). Editorial support was also provided by Anahita Gouri and Rohan Mitra (Sanofi, India). The authors, individually and collectively, are responsible for all content and editorial decisions and received no payment from Sanofi directly or indirectly (through a third party) related to the development/ presentation of this publication.

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