Incidence of cardiometabolic events among adults with major depressive disorder with and without insomnia symptoms: a real-world evidence study

Nilanjana Dwibedi[1]; Hrishikesh Kale[1]; Kathryn Krupsky[2]; M. Janelle Cambron-Mellott[2]; Kyla Finlayson[2]; Joshua Hamilton[3]; Manish Jha[4]

AFFILIATIONS: [1]Johnson & Johnson, Raritan, NJ, USA [2]Oracle Life Sciences, Austin, TX, USA [3]Washington State University, Spokane, WA, USA [4]UT Southwestern Medical Center, Dallas, TX, USA

Background

- Major depressive disorder (MDD) and insomnia symptoms have each been associated with adverse cardiometabolic outcomes[1,2]
- Cardiometabolic risk is an important consideration among patients with MDD, including those receiving pharmacologic treatment[1,3]
- The cardiometabolic burden among treated adults with MDD according to the presence or absence of insomnia symptoms remains poorly understood

Objective

- To estimate and compare the incidence of cardiometabolic events among adults with MDD with and without insomnia symptoms

Methods

STUDY DESIGN

- Retrospective cohort study using linked claims and electronic health record data from Oracle Real-World Data, 2016–2022 (**Figure 1**)
- Insomnia symptoms were operationalized using ICD-9/10 codes indicating diagnosis for insomnia

POPULATION

- Adults ≥18 years with MDD
- Initiated an antidepressant and/or antipsychotic during the study period
- ≥12 months of baseline enrollment and ≥36 months of follow-up
- No cardiometabolic conditions at baseline
- Patients were excluded if the had pre-existing cardiometabolic events or were diagnosed with schizophrenia, dementia, or other severe psychiatric disorders

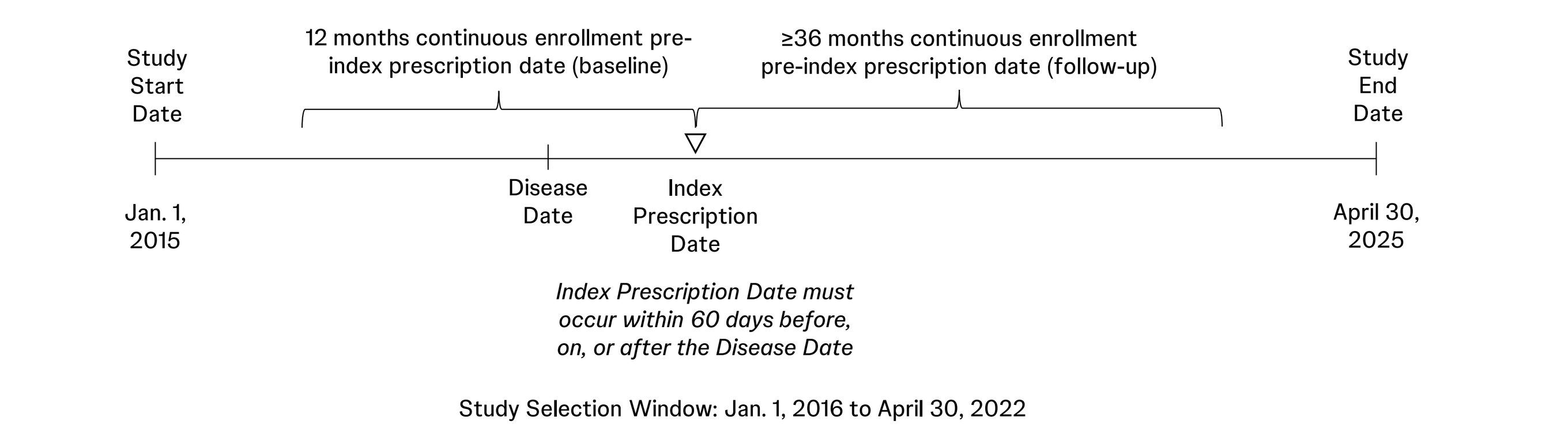
CARDIOMETABOLIC OUTCOMES

- Hypertension, prediabetes, type 2 diabetes, cardiovascular disease, hyperlipidemia, and obesity

ANALYSIS

- **Unadjusted incidence rates (IRs)** per 1,000 person-months with 95% confidence intervals (CI)
- **Incidence rate ratios (IRRs)** comparing MDD with insomnia symptoms to MDD without insomnia symptoms, with 95% CI
- **Median time-to-event (TTE)** with interquartile range

Figure 1. Time to first cardiometabolic event



Note. Patient demographics were evaluated at index. Baseline cardiometabolic events were evaluated 365 pre-index date, excluding the index date. Incident cardiometabolic outcomes were evaluated from index date to their last follow-up. It was anticipated that follow-up would end with the occurrence of a cardiometabolic event, the earliest date of treatment discontinuation (defined as a >60-day gap in medication supply), the last EHR or claims record in the study period, or the end of the study period

Results

Table 1. Baseline characteristics (N=31,190)

Characteristic	Level	Overall (N=31,190)	MDD without insomnia symptoms (N=27,339)	MDD with insomnia symptoms (N=3,851)
Age, years	Mean (SD)	36.29 (13.59)	35.95 (13.54)	38.72 (13.60)
Sex, n (%)	Male	8,959 (28.7%)	7,780 (28.5%)	1,179 (30.6%)
	Female	22,228 (71.3%)	19,556 (71.5%)	2,672 (69.4%)
Race/ethnicity, n (%)	White	14,237 (45.7%)	12,550 (45.9%)	1,687 (43.8%)
	Black	2,119 (6.8%)	1,862 (6.8%)	257 (6.7%)
	Hispanic or Latino	5,023 (16.1%)	4,369 (16.0%)	654 (17.0%)
	Other	2056 (6.6%)	1,763 (6.4%)	293 (7.6%)
	Unknown	7,755 (24.9%)	6,795 (24.9%)	960 (24.9%)
Insurance type, n (%)	Commercial	15,565 (49.9%)	13,616 (49.8%)	1,949 (50.6%)
	Medicaid	14,605 (46.8%)	12,841 (47.0%)	1,764 (45.8%)
	Medicare Advantage	864 (2.8%)	745 (2.7%)	119 (3.1%)
	Unknown/Other	636 (2.0%)	552 (2.0%)	84 (2.2%)
US Census region, n (%)	Midwest	6,735 (21.6%)	6,061 (22.2%)	674 (17.5%)
	Northeast	6,719 (21.5%)	5,995 (21.9%)	724 (18.8%)
	South	7,158 (23.0%)	6,147 (22.5%)	1,011 (26.3%)
	West	10,443 (33.5%)	9,016 (33.0%)	1,427 (37.1%)
	Unknown	135 (0.4%)	120 (0.4%)	15 (0.4%)

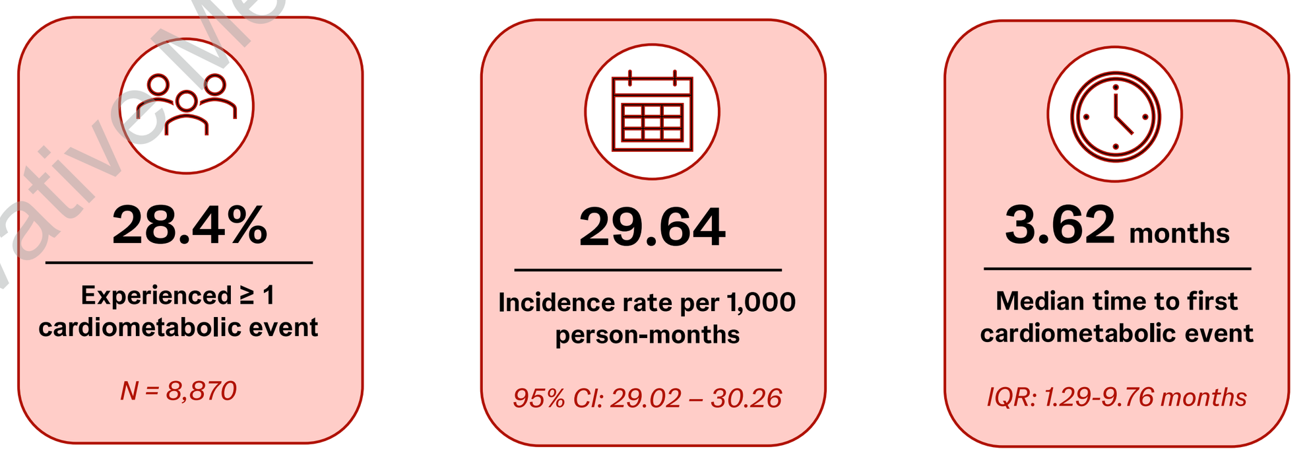
IMDD, major depressive disorder

PATIENT CHARACTERISTICS (Table 1)

- N=31,190 adults with MDD were included; 27,339 (87.7%) had MDD without insomnia symptoms and 3,851 (12.3%) had MDD with insomnia symptoms
- Patients with MDD with insomnia symptoms were somewhat older on average than those without insomnia symptoms (38.7 vs 36.0 years); sex and race/ethnicity distributions were broadly similar between groups
- Insurance distributions were also similar, with approximately half of patients commercially insured; geographic distribution differed somewhat by insomnia symptom status, with a greater proportion of MDD with insomnia symptoms patients in the South and West

Figure 2. Overall cardiometabolic burden among adults with MDD (N=31,190)

Cardiometabolic events were common and occurred early during follow-up



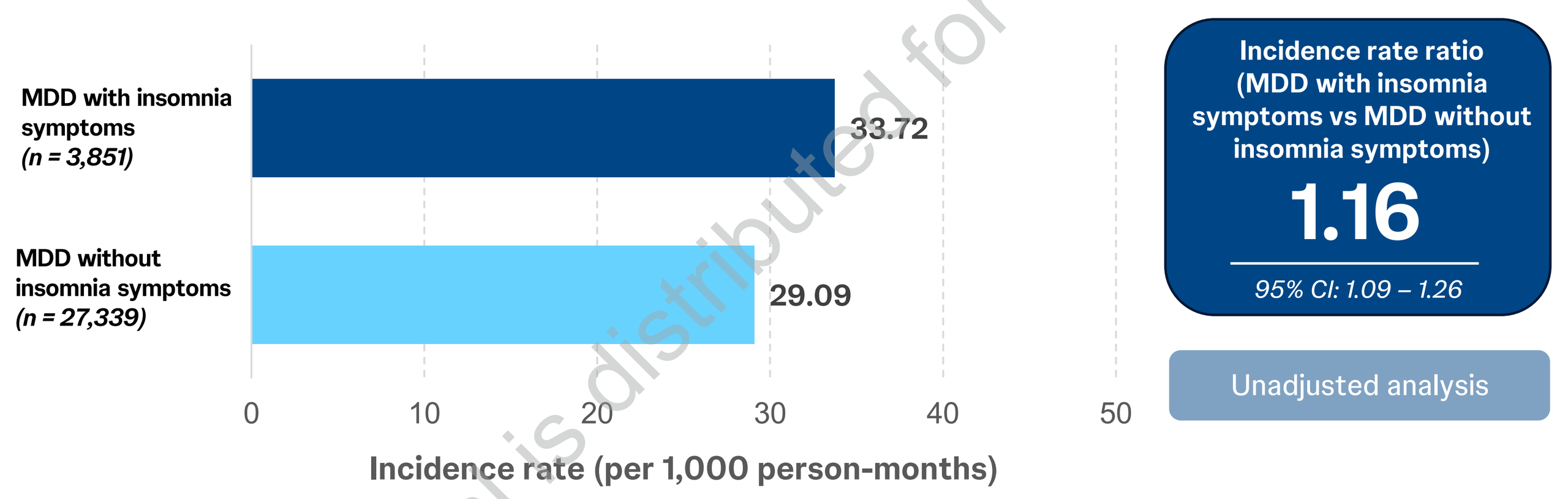
CI, confidence interval; IQR, interquartile range; MDD, major depressive disorder

INCIDENCE BY INSOMNIA STATUS

- Patients with MDD with insomnia symptoms had a higher incidence rate of any cardiometabolic event than those with MDD without insomnia symptoms (33.72 vs 29.09 per 1,000 person-months) (**Figure 3, Table 2**)
- The unadjusted incidence rate was 16% higher among patients with MDD with insomnia symptoms than those with MDD without insomnia symptoms (IRR=1.16; 95% CI: 1.09–1.23) (**Figure 3, Figure 4**)

Figure 3. Incidence of any cardiometabolic event by insomnia symptom status

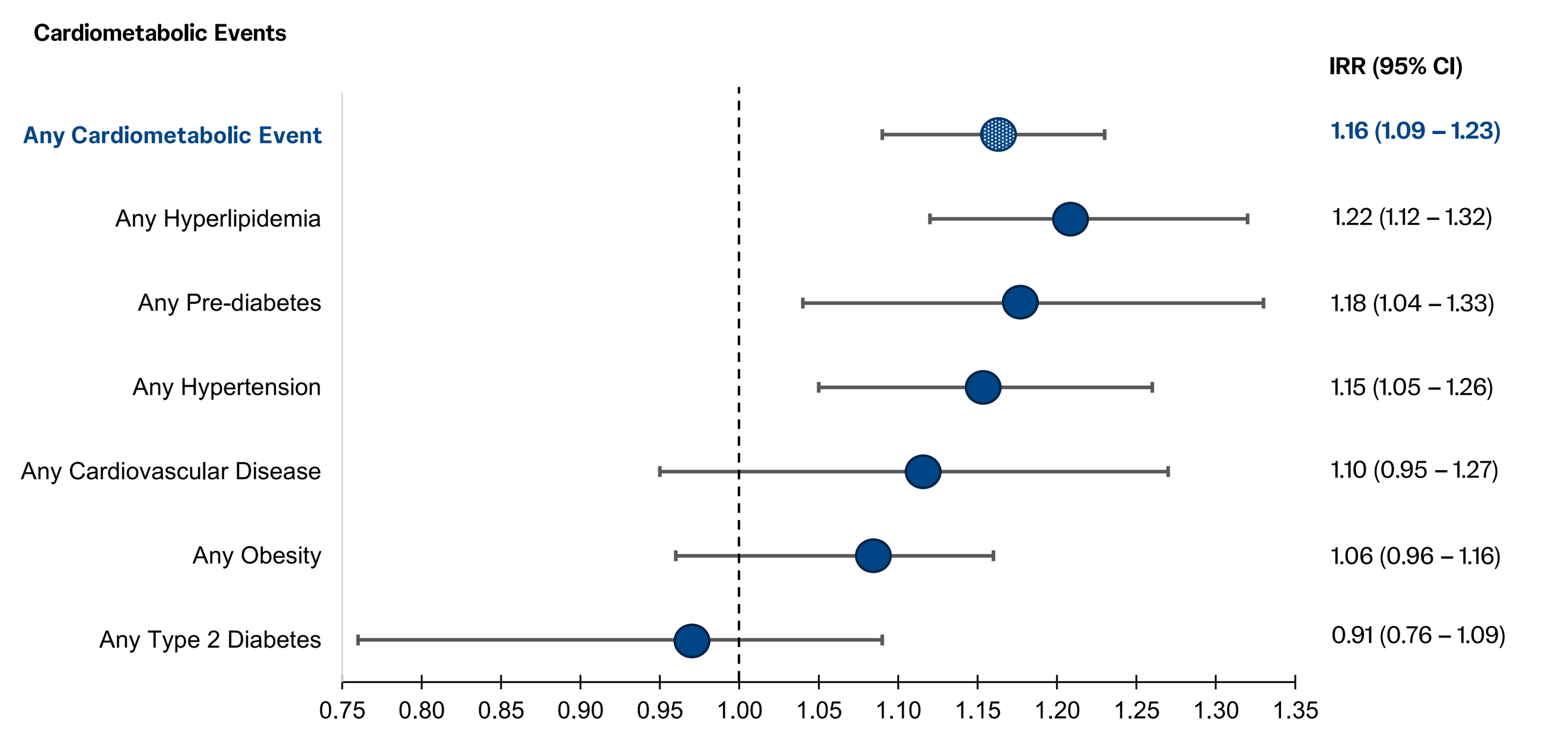
Incidence rate of any cardiometabolic event was 16% higher among adults with MDD and insomnia symptoms



CI, confidence interval; MDD, major depressive disorder
IRRs are unadjusted.

Figure 4. Unadjusted incidence rate ratios (IRR) for cardiometabolic events by insomnia status

Higher incidence rates were observed across multiple cardiometabolic outcomes among MDD patients with insomnia symptoms



IRR >1 indicates a higher incidence rate among MDD patients with insomnia symptoms versus MDD without insomnia symptoms.
IRRs are unadjusted.

Table 2. Incidence rates of cardiometabolic events by insomnia status

Cardiometabolic outcome	MDD without Insomnia Symptoms IR (95% CI)	MDD with Insomnia Symptoms IR (95% CI)
Any event	29.09 (28.45–29.75)	33.72 (31.84–35.68)
Hyperlipidemia	12.11 (11.74–12.48)	14.78 (13.69–15.94)
Hypertension	8.69 (8.39–9.00)	10.00 (9.15–10.91)
Prediabetes	4.53 (4.33–4.75)	5.34 (4.75–5.99)
Cardiovascular Disease	3.32 (3.15–3.51)	3.66 (3.19–4.19)
Type 2 Diabetes	2.44 (2.29–2.59)	2.22 (1.86–2.64)
Obesity	9.67 (9.35–10.00)	10.23 (9.37–11.15)

IRs per 1,000 person-months

OUTCOME-SPECIFIC FINDINGS (Figure 4)

- Higher incidence rates among patients with MDD with insomnia symptoms were observed across multiple cardiometabolic outcomes
- The largest relative differences were observed for hyperlipidemia (IRR=1.22), prediabetes (IRR=1.18), and hypertension (IRR=1.15)
- Point estimates were also higher for cardiovascular disease and obesity, although their confidence intervals included 1.0

Key takeaway

- Cardiometabolic events were common and occurred early among treated MDD patients
- MDD with insomnia symptoms were associated with greater cardiometabolic burden
- The largest differences between MDD patients with insomnia symptoms vs. MDD patients without insomnia symptoms were observed for metabolic and blood pressure outcomes
- Insomnia symptoms among treated MDD patients may represent an important clinical marker of cardiometabolic vulnerability

Conclusions

- Patients with MDD with **insomnia symptoms had higher unadjusted incidence rates of cardiometabolic outcomes,** with the greatest relative differences observed for hyperlipidemia, prediabetes, and hypertension
- These findings suggest that **insomnia symptoms may represent an important clinical marker of cardiometabolic vulnerability** among patients with MDD
- Routine identification, **monitoring, and management of insomnia symptoms may be an important component of comprehensive MDD care**; further research using adjusted analyses is warranted to account for potential confounding factors

Acknowledgments

The authors acknowledge James Geary, Danny Myers, Vicky Li, and Stacey Purinton of Oracle Life Sciences, for their assistance with the study design, data extraction, and analysis

Disclosures

N. Dwibedi, and H. Kale are employees of Johnson & Johnson and own stock in Johnson & Johnson. K. Krupsky, M. J. Cambron-Mellott, and K. Finlayson are employees of Oracle Life Sciences, Oracle Corporation, which received funding from Johnson & Johnson to conduct and report on the study. K. Krupsky and M. J. Cambron-Mellott also hold stocks in Oracle Corporation. M. Jha: In the past 36 months, Dr. Jha has received contract research grants from Neurocrine Bioscience, Navitor/Supernus and Janssen Research & Development; honorarium to serve as Section Editor of the Psychiatry & Behavioral Health Learning Network and as Guest Editor for Psychiatric Clinics of North America from Elsevier; consultant fees from Janssen Scientific Affairs, Sanofi, Neurocrine, Abbvie, MindMed and Boehringer Ingelheim; fees to serve on Data Safety and Monitoring Board for Worldwide Clinical Trials (Eliem, Skye and Inversargo), Vicore Pharma and IQVIA (Click); and honoraria for educational presentations from North American Center for Continuing Medical Education, Medscape/WebMD, Clinical Care Options, Soterix Medical Inc., Physicians' Education Resource, Efficient CME, and H.C. Wainwright & Co.

J. Hamilton: Josh Hamilton is a consultant and key opinion leader for Johnson & Johnson; a paid ambassador for the Point of Care Network; and a Senior Medical Science Liaison for Tempus AI. All conflicts of interest have been mitigated as Dr. Hamilton is an uncompensated author/content contributor for this project.

Funding

This study was funded by Johnson & Johnson.

Novel Pathways In Depression

Scan the QR code

Presented at: Psych Congress; September 15-19, 2026, New Orleans, LA, USA

References:

1. Vancampfort D, et al. Psychol Med. 2014;44:2017–2028.
2. Zhang Y, et al. J Clin Neurosci. 2021;89:430–436.
3. Solmi M, et al. Expert Opin Drug Saf. 2024;23:1249–1269.