Statin Use and Progression of Parkinson's Disease: A Population-Based Cohort Study

Junsung Nam[1], Hyun Woo Lee[1], Seungyeon Kim[2], Yun Mi Yu[1,3]
[1]Department of Pharmaceutical Medicine and Regulatory Sciences, Colleges of Medicine and Pharmacy, Yonsei University, Incheon, Republic of Korea
[2]College of Pharmacy, Dankook University, Cheonan, Republic of Korea
[3]Department of Pharmacy and Yonsei Institute of Pharmaceutical Sciences, College of Pharmacy, Yonsei University, Incheon, Republic of Korea

INTRODUCTION

Parkinson's Disease (PD)

- Progressive neurodegenerative disorder characterized by tremor, rigidity, bradykinesia, and postural instability
- Second most common neurodegenerative disorder after Alzheimer's disease

Statins

- Widely used to prevent cardiovascular disease by inhibiting cholesterol biosynthesis
- Suggested to reduce oxidative stress and inflammation, potentially limiting α-synuclein aggregation and protecting dopaminergic neurons

OBJECTIVES

- To evaluate the effect of statins on PD progression (mortality and dementia onset) and to compare outcomes between new and previous users

METHODS

Data Source and Study Design

- Korean national health insurance claims database (2008–2023)
- Retrospective cohort study (Figure 1)

Study Population and Exposure

- Patients aged 50-79 years, newly diagnosed with PD during 2009–2014
- Index date: first prescription of PD medication
- Exposure groups: statin users vs. non-users
  - Statin users further classified as previous or new users (based on prescriptions within 1 year before index date)
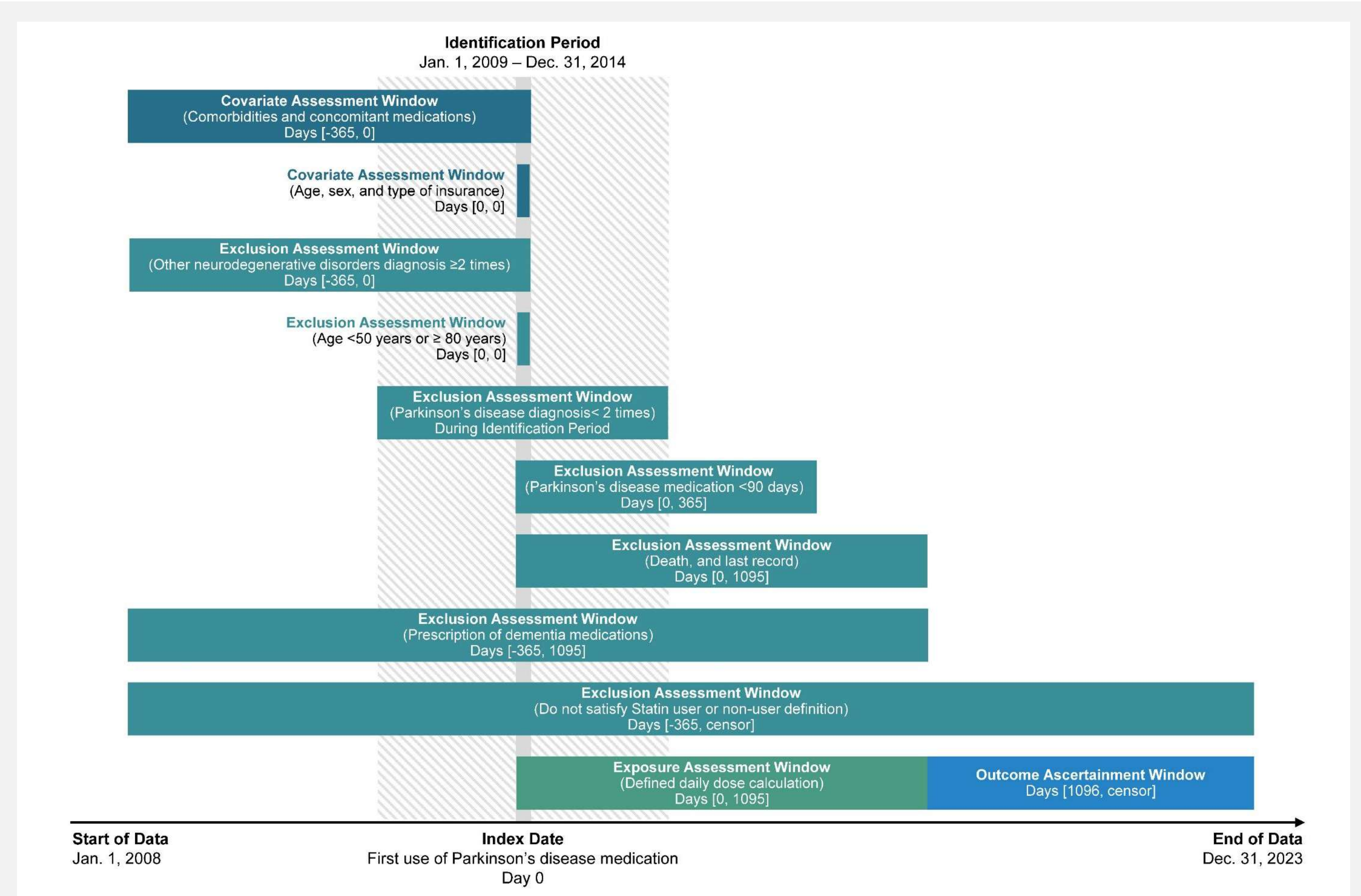- Exposure window: 3 years after index date

Figure 1. Study design and study population.

Exclusion Criteria

- Prior diagnosis of other neurodegenerative disorders (≥2 records)
- <90 days of PD medication within 1 year after index date
- No statin prescription within 6 months after index date or <90 days within 1 year

Statistical Analysis

- Statin users and non-users were 1:1 propensity score-matched for age, sex, insurance type, comorbidities, and concomitant medications.
- Outcomes: all-cause mortality, and dementia onset
- Analyses: Cox proportional hazards regression
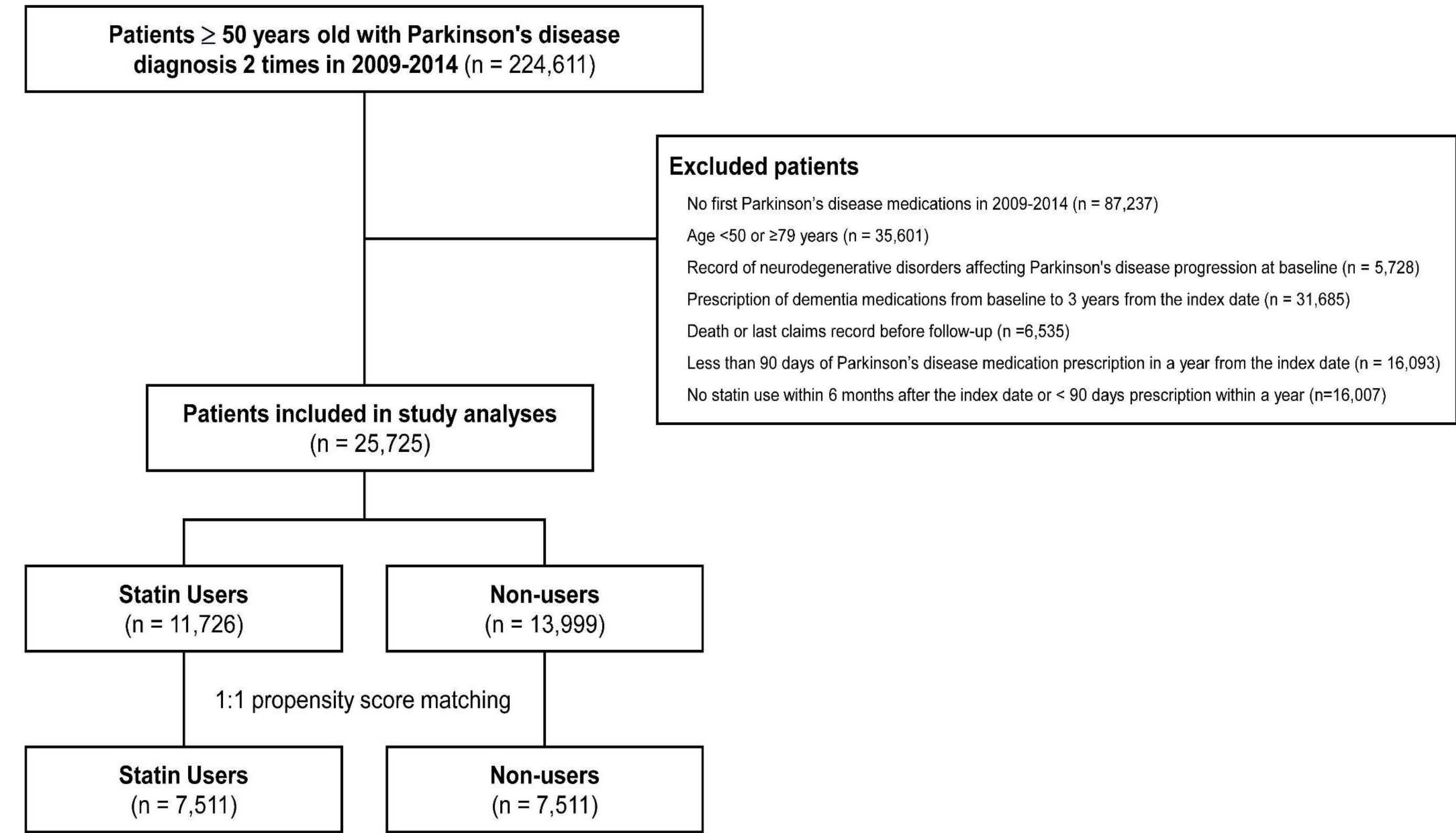- Subgroup analyses: by age and sex

RESULTS

Figure 2. Flow chart of study population inclusion.

Effects of Statins on PD Progression

- Statin use was associated with significantly lower risks of all-cause mortality, and dementia onset (Table 1).

Table 1. Hazard ratios for mortality and dementia onset with statin use

Outcome	Statin user (events / participants)	Non-users (events / participants)	HRs (95% CI)
All-cause mortality	1851 / 7511	2877 / 7511	0.58 (0.55–0.61)
Dementia onset	2318 / 7511	2398 / 7511	0.86 (0.81–0.91)

Effects of New vs. Previous Statin Use on the Risk of PD Progression

- No significant differences were observed between new and previous users in mortality risks and dementia onset compared with new users (Table 2).

Table 2. Hazard ratios for outcomes in new and previous statin users

Outcome	Group	Events / participants	HRs (95% CI)
All-cause mortality	New users	456 / 1841	0.58 (0.53–0.64)
	Previous users	1049 / 4167	0.59 (0.55–0.64)
Dementia onset	New users	571 / 1841	0.86 (0.79–0.94)
	Previous users	1296 / 4167	0.87 (0.81–0.93)

Subgroup analyses

- No significant interactions were observed between statin use and age or sex.

CONCLUSIONS

- This study suggest that statins may have disease-modifying potential and could slow the progression of PD, as evidenced by reduced risk of dementia onset and all-cause mortality.

References

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