Frailty trajectories in patients taking statins: A propensity score-matched cohort study using UK primary care data

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Background

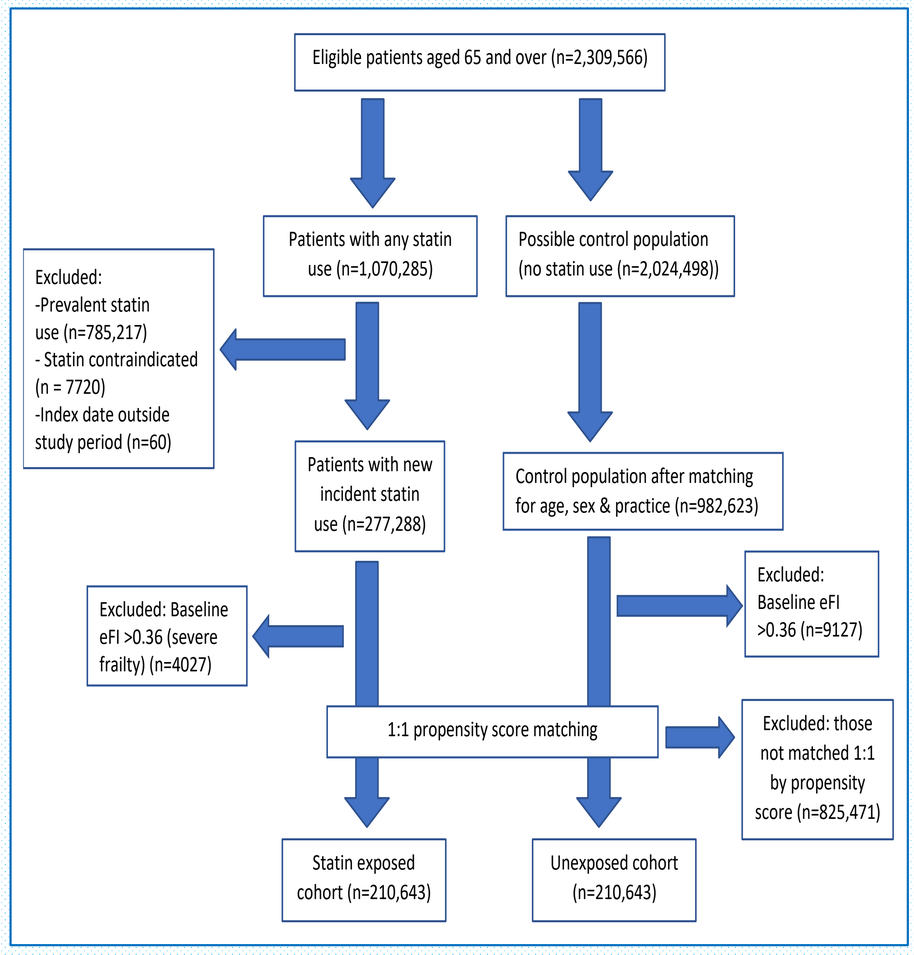
- **Frailty** - "a state of increased vulnerability… following a stress, which increases the risk of adverse outcomes including falls, delirium and disability"[1]
- Affects 26% aged 85 and over in UK[2], increases healthcare costs, rise with increasing severity[3,4]
- Primary care recommended to identify & measure frailty using the electronic frailty index (eFI); calculated automatically from GP records[5,6]
- Some medications shown to reduce frailty[7,8]
- Statins: many effects beyond cholesterol reduction including anti-inflammatory, reduced mortality and reduced incidence dementia[9]

Aim

- To examine the association between statin exposure and change in frailty severity over time

Methods

Design	Propensity score-matched open cohort study
Database	Clinical Practice Research Datalink (CPRD) GOLD
Study period	1st April 2005 - 31st January 2020
Exposure	Aged ≥65, with incident statin use (≥1 statin prescription in four consecutive quarters of a year)
Comparator	Aged ≥65, 1:1 PS-matched statin unexposed cohort
Primary outcome	Increase in eFI score ≥0.12, indicating change in severity category. eFI measured every 6/12

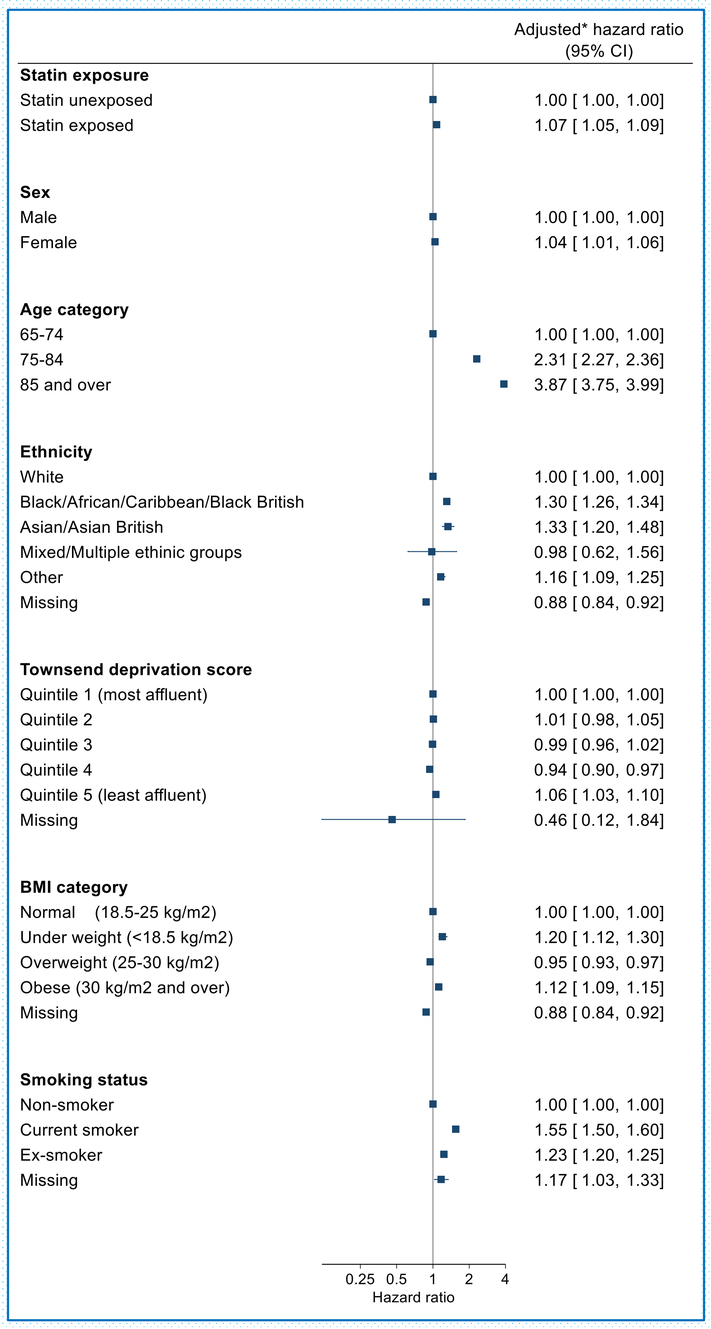


Results

- 2 cohorts of 210,643; statin-exposed & unexposed
- Balance of baseline characteristics similar
- Median age: 73.5 yrs in exposed & 72.9 yrs in unexposed
- Higher proportion female (54.6% exposed, 54.3% unexposed)
- 40% white, just under 7% black/African/Caribbean/Black British and less than 1% Asian/Asian British in both cohorts. Ethnicity data missing for ~ 50%.
- Mean BMI - 27.3 (overweight category) in both groups
- 11.4% exposed & 11.3% unexposed were current smokers
- Median baseline eFI score 0.14 (mild frailty) both cohorts

Table 1: eFI score & eFI severity categories at study exit

	Statin-exposed	Unexposed	p-value
	(210,643)	(210,643)	
eFI score (Med, IQR)	0.19 (0.11-0.25)	0.17 (0.11-0.22)	<0.001
eFI category (n(%))			<0.001
Fit	54,621 (25.9)	69,502 (33.0)	
Mild	98,108 (46.6)	90,931 (43.2)	
Moderate	51,171 (24.3)	45,202 (21.5)	
Severe	6,743 (3.2)	4,691 (2.2)	



*Adjusted for sex, age, ethnicity, Townsend score by practice postcode, BMI, smoking status and alcohol consumption

Figure 1: Forest plot - adjusted hazard ratios for eFI score change ≥0.12 (change in category)

Key findings/Conclusions

- **Statins may be associated with increased frailty progression in those over 65.**
- **7% increased hazard seen** for an increase in eFI severity category in statin exposed group
- Increasing age, female sex, black or Asian ethnicity, obese BM, current smoking and being in the least affluent Townsend quintile all increased the hazard
- **Median eFI score at study exit higher in statin exposed** – 0.19 compared to 0.17.
- **Fewer in exposed cohort remained in the fit category**, more progressed to all other severity categories.

- This study has shown it is possible to calculate frailty scores over time to determine trajectories using routinely collected primary care data
- Frailty incidence, prevalence and associated costs set to increase significantly, identifying potential treatments & exacerbators will be of growing importance for patients and policymakers.

Strengths and limitations

- **Strengths:**
- Large sample size, representative of UK population
- Propensity score matching used
- eFI scores calculated at regular intervals using electronic health record data
- **Limitations:**
- eFI may be less accurate than other frailty measures e.g. clinical assessment
- eFI unable to detect improvements
- Missing data levels high for some covariates
- Residual unmeasured confounders may be affecting outcome

References

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