EPH273

Using real-world data sources in England to quantify the burden of non-alcoholic steatohepatitis

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BACKGROUND

- Non-alcoholic steatohepatitis (NASH), also known as metabolic dysfunction-associated steatohepatitis, is a progressive form of non-alcoholic fatty liver disease (NAFLD) or metabolic dysfunction-associated steatotic liver disease [1]
- Liver biopsy is the definitive standard for diagnosis; however, the potential of complications and interobserver variability limit use in clinical practice. Due to non-specific symptoms, NASH is undetected and underreported [2]
- There is limited knowledge of NASH prevalence in England, with prior estimates based on expert consensus or data mainly pertaining to specific subpopulations [2]

OBJECTIVES

- To describe patient baseline characteristics and the incidence and prevalence of NASH using multiple NASH identification strategies in linked real-world routinely collected population datasets from England

METHODS

Data sources

- Primary care electronic medical records from the Clinical Practice Research Datalink (CPRD) Aurum
- Linked secondary care reimbursement data from the Hospital Episode Statistics (HES)

Study population

- Using CPRD Aurum and HES data and a study period of 2011-2021, we used four definitions to identify patients aged ≥18 years with NASH:
  1. ≥1 NASH-coded primary or secondary care record
  2. ≥1 NASH-coded inpatient record OR ≥2 NASH-coded outpatient or primary care records
  3. ≥1 NAFLD-coded primary or secondary care record AND a subsequent liver biopsy
  4. ≥1 NAFLD-coded primary or secondary care record AND ≥2 subsequent elastography or fibrosis scores

Data analysis

- Calculate the percentage overlap between NASH definitions
- Calculate the annual point prevalence of NASH per 100,000 on 1 March each year among patients aged ≥18 years. Only patients in follow-up on the prevalence date were included in the numerator or denominator
- Calculate the annual NASH incidence per 100,000 person-years among people aged ≥18 years, for which eligibility was limited to those with at least 12 months of prior primary care registration time to limit the inclusion of prevalent NASH. Only patients contributing follow-up time within the year of interest were included in the numerator or denominator
- Describe key baseline characteristics for incident patients

RESULTS

- There was high overlap in the patients identified using definitions 1 and 2, as definition 2 was a subset of definition 2
- There was a low overlap between all other definitions (Figure 1)

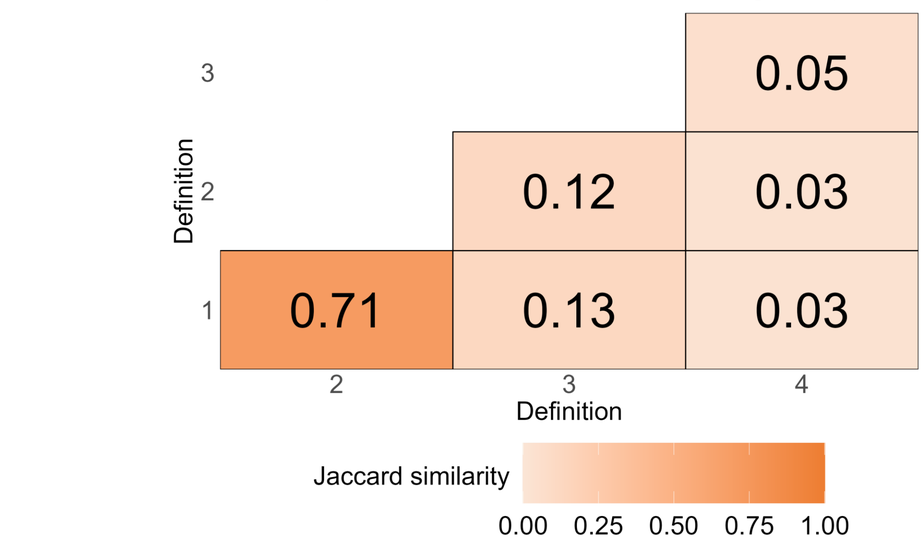

Figure 1. Similarity heatmap showing overlap between the four NASH definitions

- Mean age was similar across all definitions, while definitions 1 and 2 yielded higher percentages of females and people of white ethnicity than definitions 3 and 4 (Table 1)
- The percentages of patients with type 2 diabetes (T2D), hypertension and cardiovascular disease (CVD) were broadly similar per definition, however, percentages with highest for T2D in definitions 2 and 4, hypertension for definition 2, and CVD for definitions 1 and 2

Characteristic	Definition 1 N = 2,696	Definition 2 N = 2,101	Definition 3 N = 2,041	Definition 4 N = 1,587
Age, years, mean (SD)	56.4 (15.0)	57.5 (15.2)	54.0 (14.1)	56.6 (13.4)
Sex, female, n (%)	1,468 (54.5%)	1,182 (56.3%)	1,061 (52.0%)	757 (47.7%)
Ethnicity, white, n (%)	2,256 (83.7%)	1,758 (83.7%)	1,646 (80.6%)	1,202 (75.7%)
BMI kg/m^2, mean (SD)	33.0 (6.2)	33.1 (6.3)	33.0 (6.3)	32.9 (5.6)
Elixhauser comorbidity index, mean (SD)	2.3 (2.1)	2.7 (2.1)	2.6 (1.9)	1.6 (1.8)
Type 2 diabetes, n (%)	1,104 (40.9%)	908 (43.2%)	794 (38.9%)	680 (42.8%)
Hypertension, n (%)	1,274 (47.3%)	1,054 (50.2%)	911 (44.6%)	771 (48.6%)
Cardiovascular disease, n (%)	517 (19.2%)	468 (22.3%)	299 (14.6%)	224 (14.1%)
LDL-C mmol/L, mean (SD)	2.76 (1.08)	2.71 (1.07)	2.79 (1.04)	2.71 (1.13)
Healthcare cost £ in prior year, mean (SD)	£4,786 (£5,874)	£5,656 (£6,313)	£4,945 (£6,007)	£2,235 (£2,254)

Table 1. Baseline characteristics for the four NASH definitions

- The incidence of NASH using definitions 1, 2, and 3 followed a similar pattern over time peaking in 2019, although was consistently higher for definition 1 (Figure 2)
- The incidence of NASH using definition 4 increased steadily over time from 0.02 in 2013 to 4.44 per 100,000 person-years in 2019
- By the end of the study period the prevalence was highest for definition 1 at 26.6 per 100,000 (Figure 3)

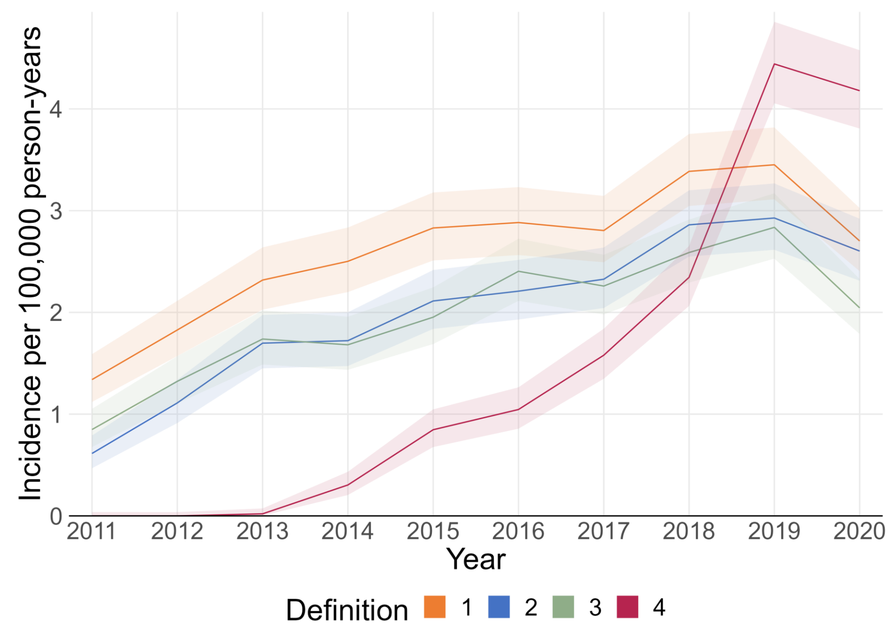

Figure 2. Incidence of NASH over time using the four definitions

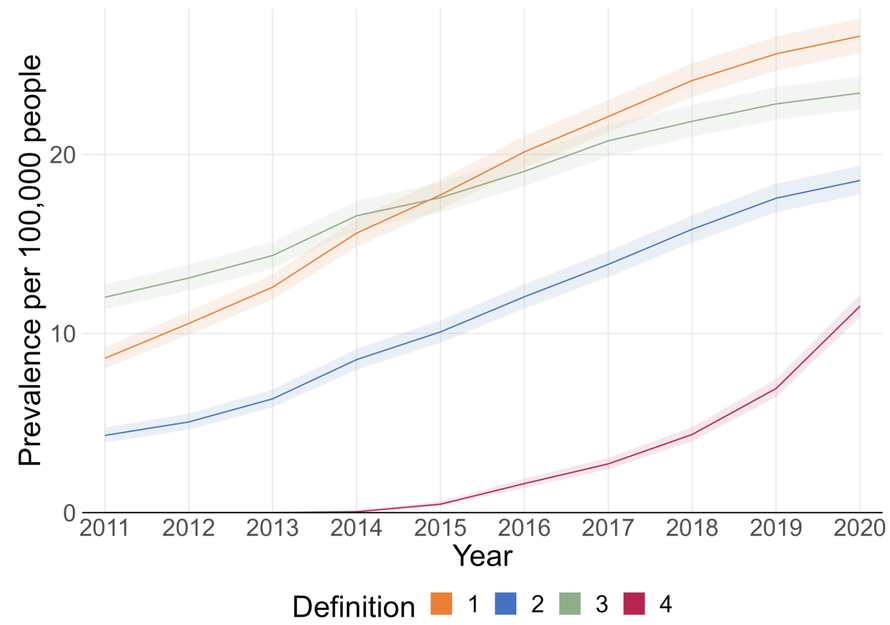

Figure 3. Prevalence of NASH over time using the four definitions

CONCLUSIONS

- NASH prevalence in our study was lower than estimates generated for England or other European countries (3-5 %) [3], however, the majority of prior estimates are based on Markov models whereas our analysis was based on large general population real-world data sources
- Given the diagnostic challenges of NASH, the incidence and prevalence may be underestimated in our study
- The difference in patients found using definition 4 could be attributed to increased use of non-invasive tests over time, possibly representing those with NAFLD at-risk of progression rather than those who have actually progressed to NASH
- Coding of NASH diagnosis in CPRD and HES appears reasonably accurate given the degree of overlap between definition 1 which only required one code and definition 2 which required two codes from primary care or outpatient settings instead of one

ACKNOWLEDGMENTS

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DISCLOSURES

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