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The prevalence of multimorbidity measured by linked healthcare data and its association with mortality in a large longitudinal cohort

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Background

Multimorbidity, the co-existence of two or more health conditions, is a growing challenge. It has been measured using health service administrative data via the emerging consensus measure by Barnett (containing 40 health conditions). However, this was developed using Scottish-specific primary care coding, which restricts its application in other health systems.

Objectives

The aim was to create International Classification of Disease (ICD) coding algorithms for all Barnett conditions, and evaluate the new measure by assessing the prevalence of multimorbidity and its association with mortality in the Aberdeen Children of the 1950s (ACONF) cohort.

Method

We combined results of a coding literature review with codes used commonly by the Scottish National Health Service, to identify ICD codes to each condition.

Participants of the ACONF were linked to their secondary-care healthcare records and mortality records. Multimorbidity was defined as the presence of two or more of the 40 conditions. The association between multimorbidity and mortality was assessed using Cox proportional hazards regression with adjustment for key covariates (age, gender, social class at birth, cognition at age 7, secondary school type and educational attainment).

Findings

The ACONF were aged 45 to 51 years in 2001. Of 8,094 ACONF members linked to administrative data, 246 (3%) had multimorbidity. Relative to those without multimorbidity, those with multimorbidity had a mortality hazard ratio (HR) of 5.9 (95% CI 4.6-7.4) over 15 years follow-up. This was unchanged when adjusted for covariates (HR 6.2, 95% CI 4.4-8.5).

Conclusion

We have created a new version of the influential Barnett measure using ICD codes, which allows for its wider application across health systems. This measure of multimorbidity was associated with increased mortality, indicating it could help predict poor outcome using administrative records.

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