

Can markers of dementia-related health be derived from primary care electronic health records?

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Background

- ❖ Understanding the progression or course of dementia over time is essential for the management of dementia
- ❖ Studies have used routine primary care electronic health records (EHR) to determine factors associated with risk of dementia onset
- ❖ Primary care EHR may also offer a potentially useful resource to measure dementia-related health after diagnosis
- ❖ It is unclear whether feasible markers of dementia-related health can be identified from primary care EHR

Aim

- ❖ Investigate whether a credible set of markers of dementia-related health can be identified in routine primary care EHR

Methods

Rapid review of EHR literature to identify potential markers

Consensus meeting to assess feasibility of markers being coded in primary care EHR; code lists derived

Recorded frequency of markers in people with dementia determined in a regional primary care EHR database (CiPCA) from 9 general practices in North Staffordshire, UK

Hypothesis-free analysis to determine other coded markers associated with dementia

Consensus meeting to finalise markers and confirm aggregation into high level domains

Twelve month recorded prevalence of domains were compared in people with dementia and matched (age, gender, GP practice) patients without dementia

Results

- ❖ 63 of the 153 potential markers identified in the rapid review were deemed to be feasible to assess in the primary care EHR and mapped to 13 domains
- ❖ Most prevalent markers in patients with dementia were:
 - 'Comorbidity' (69%)
 - 'Hypertension' (26%)
 - 'Depression, Anxiety, Stress' (39%)
 - 'Severe Mental Illness' (24%)
 - 'Musculoskeletal pain' (31%)
 - 'Poor Diet' (24%)
- ❖ Prevalence of domains in EHR was compared between 2328 people with dementia (65% female, mean age 81) and 2328 without dementia
 - 9 domains had statistically significant higher prevalence in dementia patients (**see Table**)
 - **Cognitive function, Severe Neuropsychiatric, and Care** domains had the strongest associations
 - Comorbidity was the only domain with higher prevalence in patients without dementia
 - 2 domains (Home Pressures and Diet/Nutrition) showed no association with dementia

Table.12-month period prevalence of domains, n (%)

Domain (example markers)	Dementia	Non-Dementia	OR (95% CI)
<i>n</i>	2328	2328	
Care (shared decision making, home help, day care)	414 (18)	99 (4)	4.87 (3.9, 6.1)
Home Pressures (marital problems, family issues)	28 (1)	29 (1)	0.97 (0.6, 1.6)
Severe Neuropsychiatric (severe mental illness inc psychosis, sectioned)	574 (25)	102 (4)	7.14 (5.7, 8.9)
Neuropsychiatric (depression, stress)	1170 (50)	574 (25)	3.09 (2.7, 3.5)
Cognitive Function (memory, confusion)	713 (31)	106 (5)	9.25 (7.5, 11.5)
Daily Functioning (housebound, poor mobility)	267 (11)	148 (6)	1.91 (1.6, 2.4)
Safety (fall, safety assessment, fracture)	645 (28)	483 (21)	1.46 (1.3, 1.7)
Comorbidity (cardiovascular, diabetes, musculoskeletal pain)	1600 (69)	1723 (74)	0.77 (0.7, 0.9)
Symptoms (dizziness, constipation, incontinence)	803 (34)	634 (27)	1.41 (1.2, 1.6)
Diet & Nutrition (advice on diet, weight loss)	913 (39)	894 (38)	1.04 (0.9, 1.2)
Imaging (X ray, MRI, ECG, CAT scan)	604 (26)	476 (20)	1.36 (1.2, 1.6)
Increase in Polypharmacy*	1223 (53)	1028 (44)	1.40 (1.3, 1.6)
Change in dementia drugs*	653 (28)	19 (<1)	Not calculated

OR = Odds Ratio, 95% CI = 95% Confidence Interval, * corresponds to previous 12 months

Conclusions

- ❖ Primary care EHR are able to capture domains and individual markers which have been identified as potentially important indicators of progression for people with dementia.
- ❖ The next stage of this research will analyse a large UK national primary care EHR dataset to investigate patterns of early progression using the markers and their association with long-term outcomes (hospital admission, palliative care, mortality).
- ❖ This research has the potential to provide clinically useful information to identify those at risk of more rapid progression and provide useful outcome measures for future research (e.g. trials).