Severe tooth loss and dementia in a Swedish population-based cohort: a registry-based study

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Aims

Main aim

- We aimed to explore whether tooth loss was associated with dementia

Secondary aim

- We also aimed to investigate whether severe tooth loss (STL) would be related to a particular type of dementia disorder

Research question:

Is severe tooth loss a risk marker for dementia?

Methods

Study design

- Cohort study
  - → Retrospective/historical, but with prospectively collected data
  - → Closed and fixed cohort
  - → Age restriction: 60 to 80 years

Data sources

- Data were collected through record linkage among several Swedish nationwide registries 2010 to 2018
  - → Public authority registers and quality registers
  - → The data linkage was performed by the Swedish National Board of Health and data was delivered in a pseudonymised form.

Methods

Exposure assessment

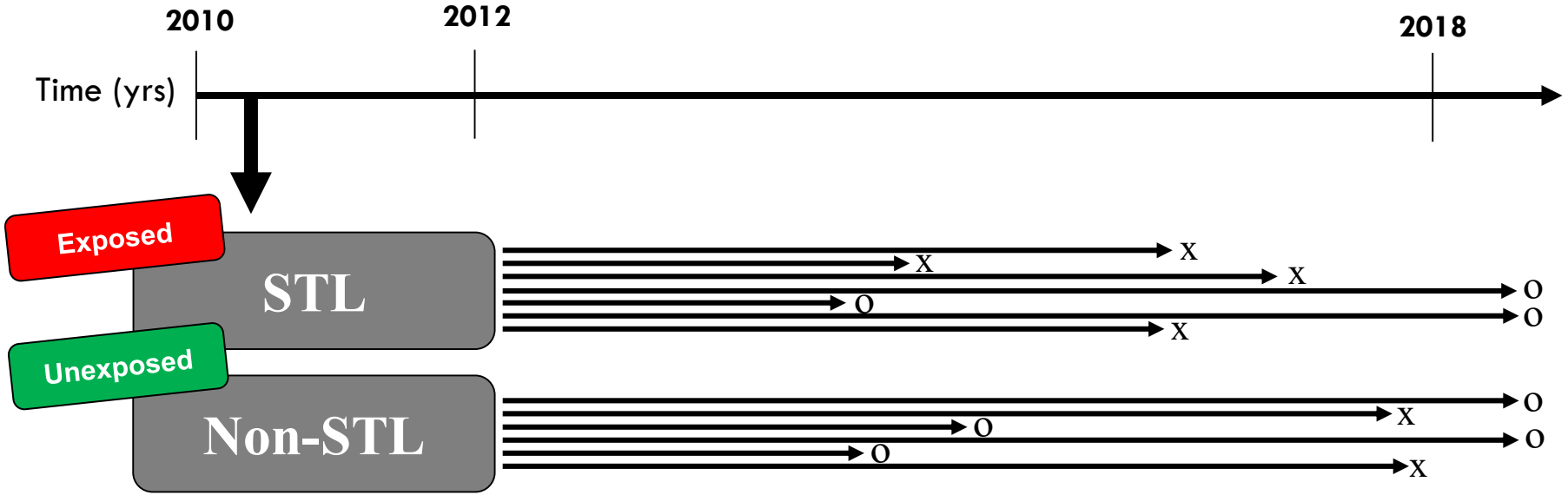
- The Swedish Quality Registry for Caries and Periodontal Diseases (SKaPa)
  - → *Exposed* group
    - Severe tooth loss (STL) defined as less than 10 teeth (0-9 teeth)
  - → *Unexposed group*
    - The STL group was contrasted with participants with 10 or more teeth (10-28)

Outcome assessment

- New dementia cases was identified
  - → All-cause dementia
  - → Dementia subgroups (Alzheimer´s disease, vascular dementia and mixed dementia)
- Dementia diagnosis before index date was excluded
- Censoring due to migration, death or end of follow-up

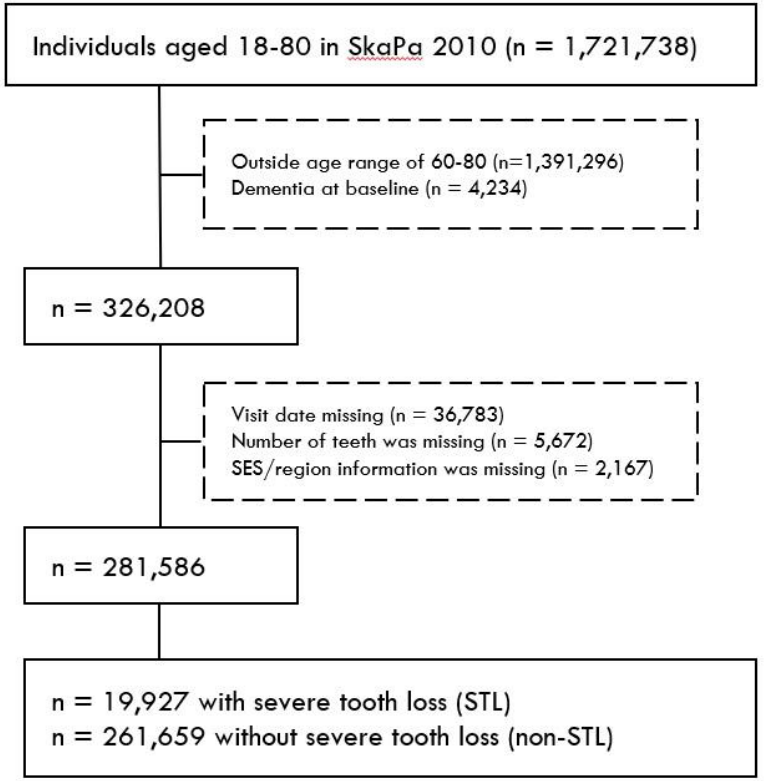
Covariates or potential confounders

- *Socioeconomic status*
  - → Collected using The Swedish Longitudinal Integrated Database for Health Insurance and Labor Market Studies (LISA)
- *Comorbidities*
  - → Collected using The National Patient Registry (the Charlson/Quan index)



Results

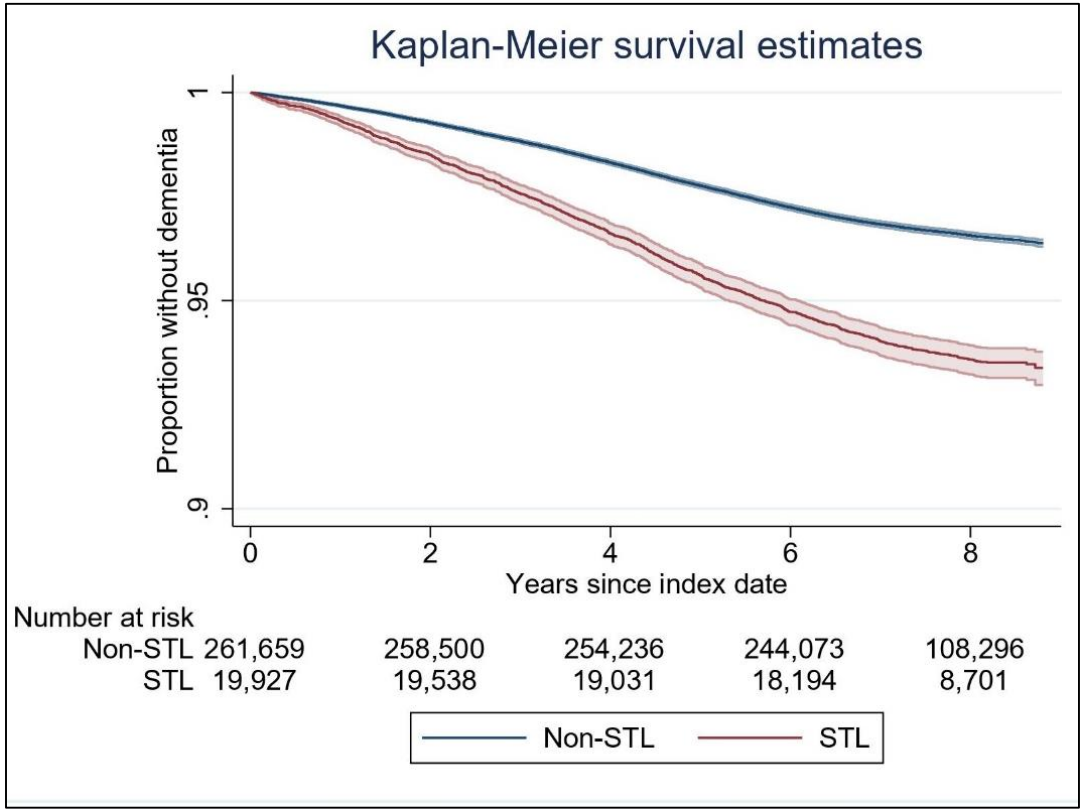
- **In total 281,586 participants**
  - → 19,927 with STL
  - → 261,659 without STL
- **Participants in the STL group were**
  - → Slightly older, less education, lower income, more comorbidities
- **The median numbers of teeth were 5 for the STL group and 24 for the non-STL group**



- **In the STL group, 3392 participants were edentulous (corresponding to 1.2% of the total study population)**

Results

- **Median follow-up**
  - → 7.9 years
- **Cumulative incidence**
  - → 6.2% of the participants developed dementia in the STL group
  - → 3.3% in the non-STL group
- **Incidence rate**
  - → 8.3 per 1000 person-years in the STL group
  - → 4.4 per 1000 person-years in the non-STL group.



- **Cox regression** (point estimates are presented as hazard ratios (HRs) with 95% confidence intervals)
- Adjustments were made for age, sex, marital status, education, disposable income, the Charlson comorbidity index, and stratification by geographical regions.

Diagnosis Number of teeth	Number of Cases	Incidence rate per 1000 person-years	Crude HR	Adjusted HR
All-cause dementia				
0-9 (n = 19,927)	1232	8.3	1.89 (1.78 to 2.01)	1.16 (1.09 to 1.23)
≥10 (n = 261,659)	8641	4.4	Reference	Reference
Alzheimer's disease				
0-9 (n = 19,927)	265	1.8	1.61 (1.42 to 1.83)	1.10 (0.96 to 1.25)
≥10 (n = 261,659)	2182	1.1	Reference	Reference
Vascular dementia				
0-9 (n = 19,927)	218	1.5	2.93 (2.53 to 3.39)	1.75 (1.51 to 2.04)
≥10 (n = 261,659)	988	0.5	Reference	Reference
Mixed dementia				
0-9 (n = 19,927)	133	0.9	1.87 (1.56 to 2.24)	1.17 (0.97 to 1.41)
≥10 (n = 261,659)	944	0.5	Reference	Reference

Discussion

- This study showed that individuals with STL had an increased incidence of dementia compared to reference individuals (the non-STL group)
- **Main strengths**
  - → Nationwide data collection with a substantial sample size
  - → Validated registries
  - → Comprehensive confounder control
- **Main limitations**
  - → Misclassification
  - → Residual confounding
  - → Limited follow-up

Conclusions

- This study demonstrated an association between tooth loss and the incidence of dementia

- This finding was consistent with the hypothesis that the loss of teeth could be involved in dementia development

- Our results indicated that severe tooth loss represents a **risk marker** for dementia and that vascular dementia, in particular, could largely explain this association.

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