Midwest Geriatrics – Palliative Fellowships Consortium

GERIATRICS TWITTER JOURNAL CLUB

#GeriJC

Association Between Age at Diabetes Onset and Subsequent Risk of Dementia

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Covey Wong, Medical Student from University of North Dakota leads discussion on this study (see video)

T1. What are the most interesting aspects of the paper?

@GeriEducator: Wonderful presentations by the student. I think this was an excellent longitudinal study with large enough sample size and extensive statistical analyses #GeriJC

@dakotasnustad: I thought the focus on the age of diabetes onset for dementia risk was interesting. As a med student, it was a good reminder for me to consider not just the presence of a chronic condition but the amount of time the patient has had the condition #GeriJC

@KahliGoBlue: Great point! With diabetes I think there are two different elements of "exposure" – time of diagnosis and severity of disease (e.g. average glucose, as measured by A1c). Would be interesting to see if A1c also correlates with dementia risk #GeriJC

@ElizCha06134239: It was nice to see the duration of diabetes correlated with dementia risk in an incremental fashion. It certainly fits with my anecdotal experience. #GeriJC

@BERosensteinMD: A1) The longitudinal cohort design and follow-up raises an interesting argument toward causality, certainly strong correlation, between diabetes duration and dementia #GeriJC

@gunderson_grant: I think the study sheds light on the importance of duration of chronic disease and associated risk, in this case DM2. I would be equally interested to see if there is a difference between duration of disease compared to age(s) of onset.

@Torrin78821753: T1: As a medical student it is interesting to see evidence of a correlation between younger age of onset of diabetes and risk of dementia #GeriJC

@CarterSchimke: T1: This study provided valuable information for providers on the diabetes-dementia link #GeriJC

@Daniela56730371: The follow up in this study really impressive, as well as the statistical analysis resources they used to eliminate confounding factors.

@Daniela56730371: about diabetes impact in dementia incidence, because of the participant numbers, long-term follow up and statistical analysis.

T2. Were the analytical approaches used in the study appropriate?

@GeriEducator: Yes, Our stats expert says they tried to think of every possible way to analyze the results and present them #GeriJC

@GeriEducator: The outcome was time to dementia, having diabetes was the key independent variable, and there were other covariates to control for. Diabetes was looked at as a) how long they were diabetic, b) how likely are they to be diabetic c) are they pre-diabetic and … #GeriJC

@GeriEducator: … d) are they diabetic with cardio complications. Are there other ways to look at diabetes? #GeriJC @NDgeriDocDahl @KahliGoBlue

@dakotasnustad: I think the use of Cox regression was appropriate since multiple variables are involved in dementia risk. They also confirmed the proportional hazards assumption with Schoenfeld residuals to ensure Cox regression was appropriate. #GeriJC

@ElizCha06134239: They seemed to take a rigorous approach to account for confounding. The longitudinal design was a strength, but it also posed some challenges (A1c not available earlier, possible changes in DM management strategies/drugs over time, etc.) #GeriJC

@KahliGoBlue: I think that is an important point – new advances in DMII control, particularly some of the new non-insulin drugs, can improve HbA1c and are less prone to hypoglycemia. Could these factors reduce risk of developing dementia? #GeriJC

@BERosensteinMD: A2) Analysis was rigorous and well-defined. Particularly well-described accounting for new onset diabetes, and how this was incorporated in further comparisons as the study progressed #GeriJC

@Torrin78821753: T2: I thought the analytical approaches were well defined and limitations such as to sample population and HbA1c data not initially available were clearly identified #GeriJC

@CarterSchimke: T2: Yes, they looked at diabetes and multiple other variables through many different angles #GeriJC

@Daniela56730371: When I first read the title and abstract of this paper I was intrigued by how they would manage confounding risk factors for cardiovascular disease alone and diabetes on the onset of dementia. On cohort studies those confounding factors are eliminated by matching expose and

@Daniela56730371: unexposed groups, stratification and statistical resources to adjust confounding https://pubmed.ncbi.nlm.nih.gov/17978811/factors.

@Daniela56730371: As the authors explain in the discussion, there wasn't a study that showed age onset and duration of diabetes correlation to dementia, expect for the Swedish Twin Registry Study. So the Whitehall II prospective cohort study really added valuable and robust new information

T3. Does the study add new knowledge to established foundations?

@GeriEducator: #GeriJC The study showed age, onset of diabetes and time to dementia correlation; Would like to hear from our faculty on this. @NDgeriDocDahl @KahliGoBlue @ drcavitale @elizabethchapman @curcumin

@curcumin: Not clear if Biological Age is more important than chronological age

@dakotasnustad: Absolutely! Although previous studies have shown an association between type 2 diabetes and dementia, this study took that a step further by showing this association in terms of the time between the age of onset of diabetes and dementia #GeriJC

@ElizCha06134239: While we already knew DM was a risk factor for dementia, this shows the effect of exposure to DM over a longer time as having an association with incident dementia and development at a younger age #GeriJC

@BERosensteinMD: A3) The assoc. w/earlier onset and duration of diabetes w/risk of dementia had not previously been well described. They also showed a strong correlation to other CV complications & lack of assoc. w/prediabetes. Vascular DM complications drive risk > hyperglycemia? #GeriJC

@gunderson_grant: This study does establish a link between earlier onset of DM2 and dementia which was previously not well documented. However the study does not answer whether this is a primary mechanism of DM2 as hypothesized, or due to increased risk for secondary complications #GeriJC

@Torrin78821753: T3: With few previous studies investigating this temporally, this study adds knowledge in that respect #GeriJC

@CarterSchimke: T3: While it has been thought that diabetes likely contributes to the dementia process in a temporal manner, this paper provides data to back this #GeriJC

T4. What are the weaknesses of the study (design)?

@GeriEducator: #GeriJC @CoveyWongy talks about a lot of these in his presentation. Another issue I think might be bias that was brought in by having only people employed in London based government jobs. This questions the generalizability of the results?

@dakotasnustad: One weakness is in the generalizability of the results, since longitudinal study participants tend to be healthier than the general population, and the population itself is reflective of the UK's population in the 1980s when the study began #GeriJC

@ElizCha06134239: Lack of diversity and the healthier than average population limit the generalizability. Also, missing data regarding type of dementia and diabetic control (by A1c) are limiting. Would love to see how A1c impacts dementia risk and whether it is all vascular or AD risk #GeriJC

@BERosensteinMD: A4) Didn't stratify by DM control – lack of assoc. w/pre-diabetes suggest level of DM control as a factor. Is there a difference btwn those on oral meds and those w/insulin? Is assoc. with diabetes a proxy to other dementia risk factors? #GeriJC

@BERosensteinMD: A4 cont'd) Stratification by dementia type (though may not have been possible with cohort) – but would be interesting since we often think of DM as a vascular risk factor but there is an association to AlzD also #Geri JC

@gunderson_grant: There were a few covariates that were not analyzed according to the methods such as pre-existing neurological diseases, and other CV diseases such as Hypercholesterolemia #GeriJC

@Torrin78821753: T4: While the longitudinal data was convenient, the sample population is limiting and raises questions about generalizability of the results #GeriJC

@Torrin78821753: T4: T2DM definition included "or" which raises questions regarding semantics along with questions of what was included in "use of diabetes medication" in this definition #GeriJC

@CarterSchimke: T4: The age at end of follow-up (69-89 (meant that many patients may not have yet reached an eventual dementia onset. Additionally, since dementia is a broad umbrella term, additional work looking into dementia subtype would be interesting #GeriJC

@Daniela56730371: The aurora talk about limitations int his study:
1. Inability to distinguish between dementia subtypes.
2. Participants on longitudinal studies tend to be healthier
3. HBA1c analysis wasn't available in the beginning of the study
4. Dementia was ascertained by the EMR

@Daniela56730371: 5. Younger patients needed longer follow up. This study is definitely a useful tool to apply in our practice reinforcing the idea of type diabetes prevention in our group of patients is cornerstone not only in preventing cardiovascular disease but dementia

T5. How would you introduce the findings in your practice?

@GeriatricsJC: Tagging Faculty/Fellows here for their input. @BERosensteinMD @drvacitale @KahliGoBlue @curcumin @NDgeriDocDahl @Daniela56730371 @Antharamphani @ElizCha06134239 @uw_geriatrics

@dakotasnustad: As a med student, this article was a good reminder to be more aware of the amount of time an individual has had a chronic disease, like type 2 diabetes and how that impacts their risk for other conditions such as dementia #GeriJC

@ElizCha06134239: We don't know how diabetic control affects dementia risk, but perhaps the finding that prediabetes didn't correlate with dementia development could be used to motivate patients with prediabetes to change their lifestyle to avoid overt DM and dementia too #GeriJC

@BERosensteinMD: A5) We have many good reasons to prevent completely and better control diabetes, but many of them are less tangible to our patients. The risk of dementia may be more motivating as many people have some level of experience w/dementia #GeriJC

@gunderson_grant: A good discussion point from this article in my opinion is that delaying diabetes onset for a few years could lower the risk of dementia even if lifestyle changes for total prevention are unfeasible #GeriJC

@NDgeriDocDahl: I agree discussing this with our young diabetics can help motivate the harder lifestyle changes. Just goes to show how much preventative medicine and lifestyle at a young age can affect the quality of our elderhood!

@Torrin78821753: T5: As a medical student, this article encouraged thought on processes of chronic disease and the role/potential impact of preventative medicine #GeriJC

@CarterSchimke: T5: Have dementia on the radar in patients with a younger DM diagnosis age #GeriJC