

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Age related differences in glycaemic control, cardiovascular disease risk factors and treatment in patients with type 2 diabetes: a cross-sectional study from the Australian National Diabetes Audit
AUTHORS	Nanayakkara, Natalie; Ranasinha, Sanjeeva; Gadowski, Adelle; Davis, Wendy; Flack, Jeffrey; Wischer, Natalie; Andrikopoulos, Sof; Zoungas, Sophia

VERSION 1 – REVIEW

REVIEWER	Soon H Song Department of Diabetes and Endocrinology, Northern General Hospital, Sheffield, United kingdom
REVIEW RETURNED	09-Dec-2017

GENERAL COMMENTS	<p>This cross sectional study examined the glycaemic control and CVD risk profile of patients with type 2 diabetes diagnosed below and above 60 years of age and showed that younger age of diagnosis was associated with poorer diabetes control and adverse CVD risk profile.</p> <p>Comments:</p> <p>(1) Younger onset type 2 diabetes is generally defined with lower age of diagnosis (ie <40 yrs) than 60 years. Can the authors clarify the reason for choosing this cut off age?</p> <p>(2) Majority of patients were under the care of tertiary hospital vs community/primary care centres. This may introduce bias to the conclusions. Comparison should be made between these 2 cohorts to determine if there is any difference in glycaemic control and CVD risk profiles. The patient numbers should be sufficiently large to allow this analysis to be done.</p> <p>(3) There is no data on CVD medications ie anti-hypertensive and statin. This should be shown to see if there is any difference among those with and without macrovascular complications (ie primary vs secondary prevention) in younger vs later onset cohort.</p> <p>(4) Is there any sex difference in the diabetes complications?</p> <p>(5) Sex difference in CVD treatment is well known in younger onset type 2 diabetes. Women are generally less likely to receive CVD treatment. Is this the case in Australia? This data should be shown. If there is a difference, can the authors offer explanation pertinent to the Australian environment?</p> <p>(6) I suggest showing group comparison of 'hypertension' and</p>
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	'dyslipidaemia' in addition to the raw data on systolic/diastolic BP, total cholesterol, LDL-C, HDL-C and triglyceride in Table 1. This will give a better indication on the burden of these CVD risk factors.
REVIEWER	Prof Andy Collier NHS Ayrshire and Arran, University Hospital Ayr, UK
REVIEW RETURNED	15-Dec-2017
GENERAL COMMENTS	<p>This is an interesting cross-sectional study investigating glycaemic control, cardiovascular risk factors and treatment in patients with type 2 diabetes in Australia. It is a moderate sized population attending secondary and tertiary referral centres. That will lead to some patient selection bias.</p> <ul style="list-style-type: none"> • It is probable that there will be an over referral of overweight or obese poorly controlled patients to promote better control in young patients and this is the major flaw in this paper. It is difficult to know how the authors could disprove referral bias • Again, bias will depend on GP referral which is mentioned in the final paragraph of the discussion • Yet the same paragraph states the patients in this audit “are likely to be similar to patients attending diabetes clinics throughout Australia” • Patient referral patterns may reflect the considerable proportion on insulin therapy in the study • I am not clear why the first 2 years were extracted from the study and the reasons should be made more explicit. It is not due to the excellent glycaemic control, hypertension control etc of the patients • I assume that BMI should > 30 kg/m² • The lipid targets were very tight and probably accounts for the poor treatment gap – why so tight? • The discussion (in my opinion) is too long • There is no journal in reference no 29.

VERSION 1 – AUTHOR RESPONSE

Thank you for your email and your detailed comments on our manuscript. In line with the comments received, we have revised the manuscript's methods, results, discussion and conclusions. We believe that our manuscript now provides a more balanced, reliable and up to date assessment of differences in the achieved levels and management of (1) glycaemic control and (2) cardiovascular risk factors among younger and older patients with type 2 diabetes.

Specifically, the authors feel that this manuscript warrants publication because:

1. The literature contains few studies examining the differences in glycaemic control and cardiovascular risk factors between younger and older patients with type 2 diabetes, and these report inconsistent findings. This is especially important given the prevalence of type 2 diabetes has increased by 70% in people aged 20-44 years and by 48% in people aged 45-64 years in the last three decades, making these the fastest growing groups of people with type 2 diabetes. Diabetes complications are related to disease duration and glycaemic control, thus younger people with diabetes, are at highest risk for end-organ damage.
2. Analysing data from 3496 adult participants of the Australian National Diabetes Audit (ANDA) we found that younger patients with significantly shorter disease duration were less likely to achieve recommended targets for glycaemic control, blood pressure and lipids than older patients. Younger patients were also more likely to be obese and to smoke compared with older patients. Of patients not achieving glycaemic, blood pressure, and lipid targets, younger patients were approximately twice as likely to either not be on therapy or to be above target

despite therapy than older patients. These effects were significant after adjustment for other relevant confounders.

3. Our findings are a call to action for health care providers. Younger patients may benefit from more targeted, evidence-based, multi-disciplinary initiatives to maintain intensive glycaemic control and optimise cardiovascular risk factors. Such measures may minimise the incidence and severity of diabetes related complications in younger patients, thereby reducing morbidity and mortality.

We indicate our changes point by point in the 'response to reviewers' document and in the manuscript highlighted in blue font. We have taken particular care to improve the manuscript in accord with the reviewers' comments and have addressed all the formatting requirements. We look forward to hearing from you and hope that this revised manuscript is now acceptable for publication in BMJ Open, given its broad readership and position as a leading peer-reviewed diabetes journal. We feel that that this large, national study will be of interest to readers and may inform important health care improvement initiatives. Thank you for considering this manuscript for publication in BMJ Open.

VERSION 2 – REVIEW

REVIEWER	Soon H Song Department of Diabetes, Northern General Hospital, Sheffield S5 7AU, United Kingdom
REVIEW RETURNED	31-Mar-2018

GENERAL COMMENTS	The various issues have been adequately addressed.
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