MICRO LABS LIMITED

Diabetes Update

Vol. 1 | Issue 19 | 2020

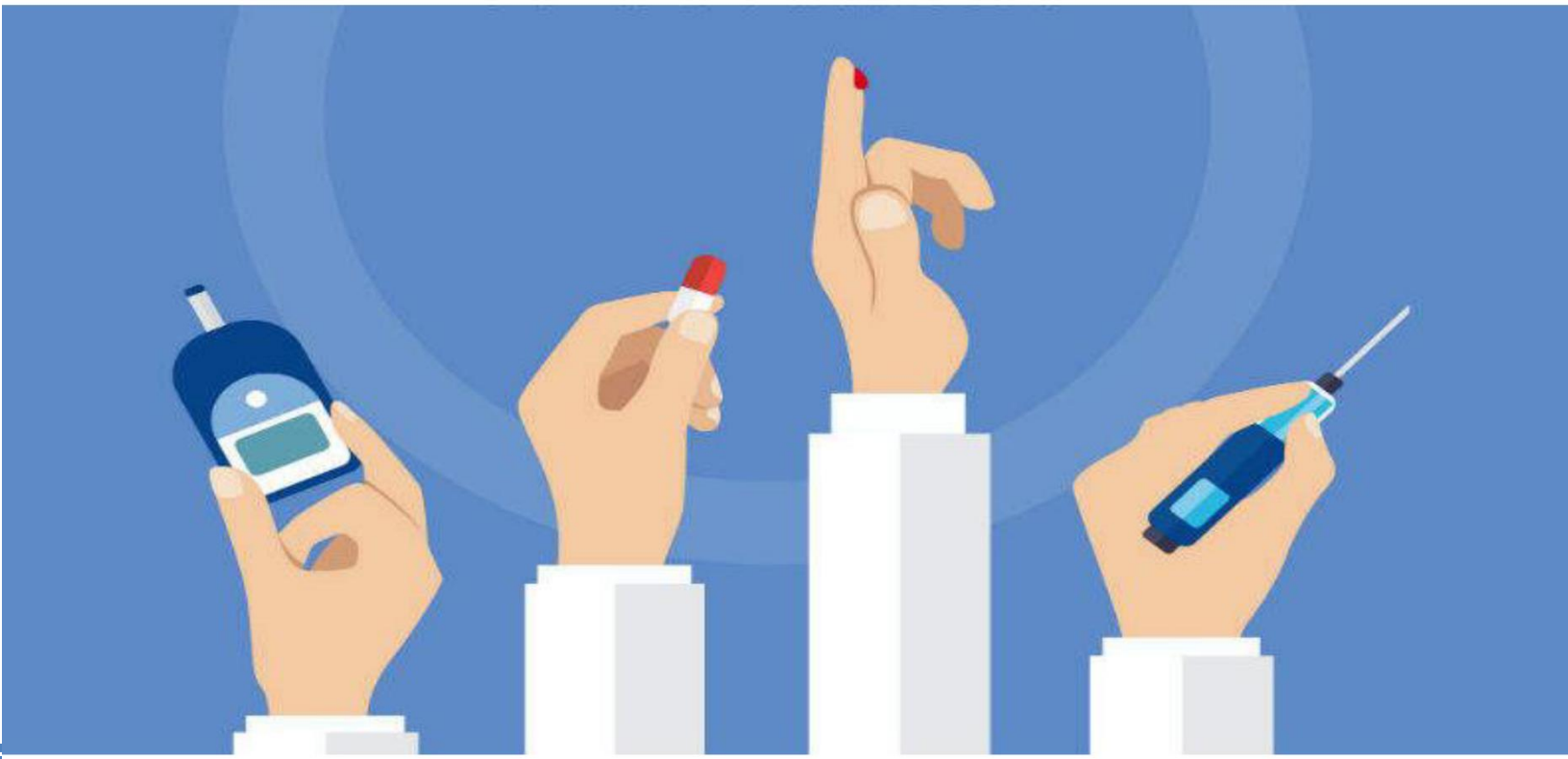
Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you **"DIABETES UPDATE"** which contains latest and interesting news in the field of Diabetes and Endocrinology.

- Arterial Stiffness as Predictor Mortality in Individuals with Type 1 Diabetes
- Temporal Trend in Young-Onset Type 2 Diabetes—The Macrovascular and Mortality Risk
- Diabetes Mellitus Is Associated with a Lower Risk of Gout: A Meta-Analysis of Observational Studies

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback
Best Regards,
Medical Team, Micro Labs Limited



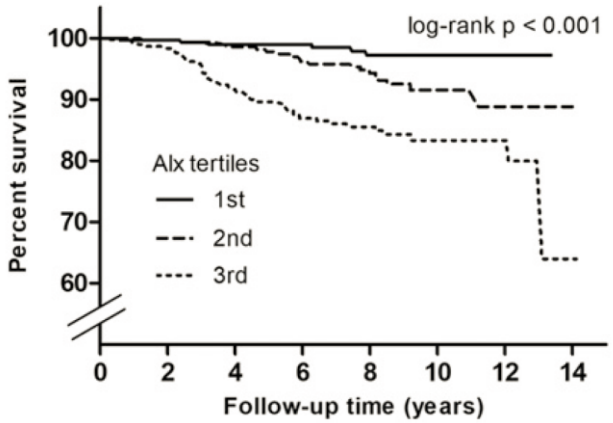
Arterial Stiffness as Predictor Mortality in Individuals with Type 1 Diabetes

Cardiovascular disease (CVD) is the leading cause of the excess morbidity and mortality observed in individuals with type 1 diabetes, and the standardized mortality ratio is known to increase by each stage of diabetic nephropathy. Arterial stiffness is a well-known predictor of mortality in the general population and in selected groups, including those with type 2 diabetes, yet no longitudinal studies have been carried out in individuals with type 1 diabetes.

Tynjala et al. conducted a study to explore whether arterial stiffness estimated by the augmentation index (AIx) predicts mortality in individuals with type 1 diabetes. After baseline examination comprising pulse wave analysis by applanation tonometry alongside assessment of traditional cardiovascular risk factors, 906 individuals with type 1 diabetes from the Finnish Diabetic Nephropathy (FinnDiane) Study were followed up for a median of 8.2 (5.7–9.7) years. Associations between baseline hemodynamics, including AIx, and all-cause mortality as well as a composite of cardiovascular and/or diabetes-related mortality were investigated using multivariable Cox regression models.

The 67 individuals who died during follow-up had higher baseline AIx (28% [21–33] vs. 19% [9–27]; P < 0.001) compared with those alive. This association was independent of conventional risk factors (age, sex, BMI, HbA1c, estimated glomerular filtration rate [eGFR],

and previous CVD event) in Cox regression analysis (standardized hazard ratio 1.71 [1.10–2.65]; P = 0.017) and sustained in a subanalysis of individuals with chronic kidney disease.



Kaplan-Meier survival curves with log-rank tests for all-cause mortality (N=67) by AIx tertiles.

Yes (*N* = 53)		No (*N* = 14)	
Added variable	AIx sHR (95% CI)	Added variable	AIx sHR (95% CI)
	3.469 (2.315–5.199); *P* < 0.001		1.426 (0.779–2.609); *P* = 0.250
+ Male sex	4.402 (2.896–6.691); *P* < 0.001	+ Male sex	1.561 (0.815–2.991); *P* = 0.179
+ BMI	4.338 (2.843–6.619); *P* < 0.001		
+ eGFR	2.794 (1.767–4.419); *P* < 0.001		
+ CVD event	2.743 (1.674–4.493); *P* < 0.001		
+ Height	2.296 (1.378–3.825); *P* = 0.001		
Cardiovascular mortality			
Yes (*N* = 36)		No (*N* = 31)	
Added variable	AIx sHR (95% CI)	Added variable	AIx sHR (95% CI)
	3.410 (2.085–5.578); *P* < 0.001		2.234 (1.396–3.574); *P* = 0.001
+ Male sex	4.209 (2.522–7.022); *P* < 0.001	+ Male sex	2.754 (1.668–4.546); *P* < 0.001
+ Diabetes duration	2.686 (1.505–4.792); *P* = 0.001	+ HbA_{1c}	2.514 (1.525–4.143); *P* < 0.001
+ eGFR	2.157 (1.197–3.887); *P* = 0.010	+ CVD event	2.213 (1.317–3.716); *P* = 0.003
+ CVD event	2.355 (1.224–4.530); *P* = 0.010	+ Total cholesterol	2.105 (1.247–3.555); *P* = 0.005

AIx in association with cardiovascular and diabetes-related mortality in multivariable Cox regression models Cardiovascular/diabetes-related mortality

AIx predicts all-cause mortality as well as a composite CVand / or diabetes-related cause of death in individuals with type 1 diabetes, independent of established CV factors

Similarly, higher AIx was associated with the composite secondary end point of cardiovascular and diabetes-related death (N = 53) after adjustments for sex, BMI, eGFR, previous CVD event, and height (standardized hazard ratio 2.30 [1.38–3.83]; P = 0.001)..

AIx as an estimate of stiffness in the small resistance arteries is independently associated with all-cause mortality, as well as the composite of cardiovascular and/or diabetes-related mortality in type 1 diabetes. These results together with the earlier findings suggest that detection of early vascular aging in individuals with type 1 diabetes could have complementary value in clinical risk assessment when targeting a more aggressive treatment approach for high-risk individuals.

Source: Tynjala A et al. Diabetes Care 2020 Jul; dc200078. https://doi.org/10.2337/dc20-0078

Temporal Trend in Young-Onset Type 2 Diabetes—The Macrovascular and Mortality Risk

Type 2 diabetes, once considered a disease of middle and old age, is frequently diagnosed in adolescents and young adults because of the rising prevalence of obesity and lifestyle changes. The study was done to evaluate temporal prevalence trend, cardiometabolic risk factors, and the risk of atherosclerotic cardiovascular disease (ASCVD) and all-cause mortality (ACM) in incident young- and usual-onset type 2 diabetes.

From the U.K. primary care database, 370,854 people with a new diagnosis of type 2 diabetes from 2000 to 2017 were identified. Analyses were conducted by age-group (18–39, 40–49, 50–59, 60–69, 70–79 years) and high-/low-risk status without history of ASCVD at diagnosis, with two or more of current smoking, high systolic blood pressure, high LDL-C or chronic kidney disease classified as high risk.

The proportion of people aged <50 years at diagnosis increased during 2000–2010 and then stabilized. The incidence rates of ASCVD and ACM declined in people aged ≥50 years but did not decrease in people <50 years. Compared with people aged ≥50 years, those aged 18–39 years at diagnosis had higher obesity (71% obese) and higher HbA1c (8.6%), and 71% had high LDL-C, while only 18% were on cardioprotective therapy. Although 2% in this age-group had ASCVD at diagnosis, 23% were identified as high risk. In the 18–39-year age-group, the adjusted average years to ASCVD/ACM in high-risk individuals (9.1 years [95% CI 8.2–10.0]/9.3 years [8.1–10.4]) were similar to those with low risk (10.0 years [9.5–10.5]/10.5 years [9.7–11.2]). However, individuals ≥50 years with high risk were likely to experience an ASCVD event 1.5–2 years earlier and death 1.1–1.5 years earlier compared with low-risk groups ($P < 0.01$).

Unlike usual-onset, young-onset type 2 diabetes has a similar cardiovascular and mortality risk irrespective of cardiometabolic risk factor status at diagnosis. The guidelines on the management of young-onset type 2 diabetes for intensive risk factor management and cardioprotective therapies need to be urgently reevaluated through prospective studies.

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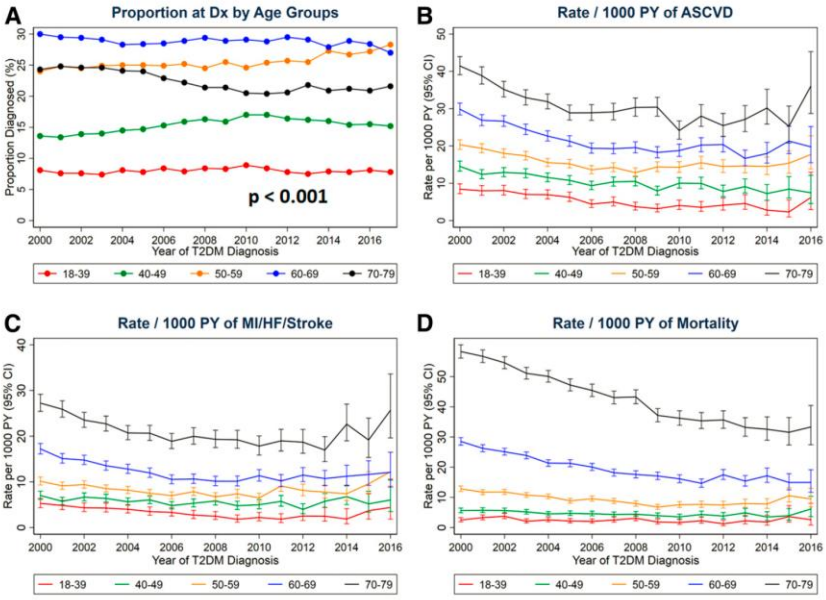


Figure —A: Temporal pattern of patients diagnosed with type 2 diabetes annually from 2000 by age-group. B: Rate/1,000 PY of ASCVD from 2000 by age-group among those without a history of ASCVD at diagnosis. C: Rate/1,000 PY of MI, HF, or stroke from 2000 by age-group among those without a history of ASCVD at diagnosis. D: Rate/1,000 PY of ACM from 2000 by age-group. Dx, diagnosis; T2DM, type 2 diabetes mellitus.

Type 2 diabetes in young people is a high-risk phenotype with high cardiometabolic risk. Although there have been declines in rates of cardiovascular events and ACM over the past 15 years, these rates seem to have not changed in patients with young-onset type 2 diabetes. Among patients with young-onset type 2 diabetes without a history of ASCVD at diagnosis, the risk of ASCVD has been similar, irrespective of the cardiometabolic risk status at diagnosis. In view of substantial high risk and the life years lost in younger patients with type 2 diabetes, there is an urgent need for tight risk factor control and a need for further research on best methods to manage this group. This includes models of care, multifactorial risk factor control,

and cardiovascular outcome trials using novel therapies.

Source: Koye ND et al. Diabetes Care 2020 Jun; dc200417. https://doi.org/10.2337/dc20-0417

Diabetes Mellitus Is Associated with a Lower Risk of Gout: A Meta-Analysis of Observational Studies

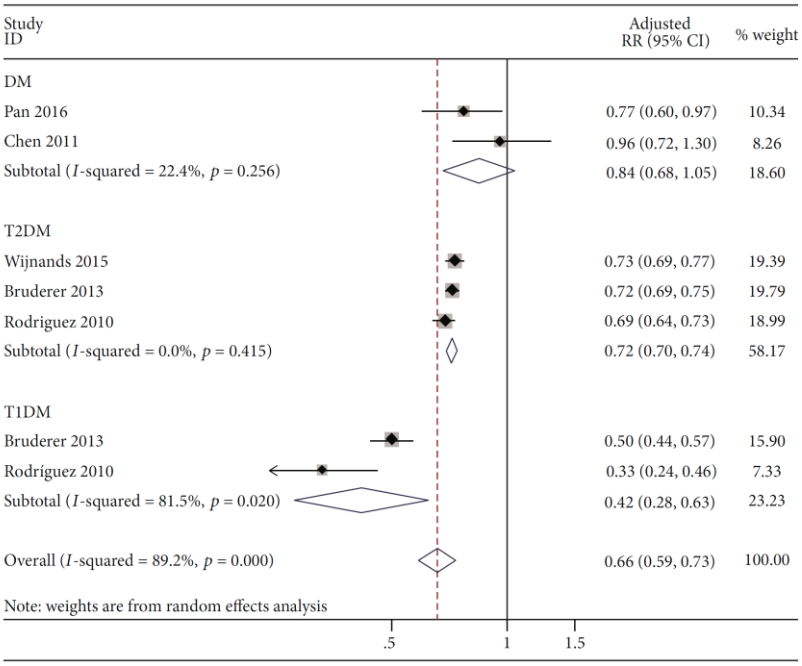
Individuals with T2DM generally have a higher prevalence of high blood pressure, obesity, and decreased kidney function. These comorbid conditions are also risk factors of gout. Although several epidemiological studies have investigated the relationship between diabetes mellitus (DM) and the risk of gout, the results are inconsistent. Therefore, we systematically retrospected available observational studies to clarify the impact of DM on the risk of gout.

Embase, PubMed, Cochrane Library, Scopus, Web of Science, and China National Knowledge Infrastructure were searched for relevant articles from inception to 2 March 2020. The quality of the included studies was assessed using the Newcastle-Ottawa Quality Assessment Scale. The multivariate adjusted relative risks (aRR) and corresponding 95% confidence intervals (CI) were pooled based on a random-effect model. Cochran's test and were used to evaluate heterogeneity.

Five studies involving 863,755 participants were included in our meta-analysis. DM was associated with a lower risk of gout (aRR: 0.66; 95% CI: 0.59 to 0.73) but had a high heterogeneity (). Metaregression analysis revealed that the types of DM were the source of heterogeneity. Subgroup

This meta-analysis indicated that DM was related to a lower risk of gout, and the protective effect of DM on the risk of gout was stronger in males, T1DM, or DM with high HbA1c levels.

analysis by types of DM showed that the risk of gout was significantly lower in type 1 DM (T1DM) (aRR: 0.42; 95% CI: 0.28 to 0.63) than in type 2 DM (T2DM) (aRR: 0.72; 95% CI: 0.70 to 0.74).



Subgroup analysis of the risk of gout in individuals with DM: grouped by types of DM.

DM: diabetes mellitus; T2DM: type 2 diabetes mellitus; T1DM: type 1 diabetes mellitus; RR: relative risk; CI: confidence interval.

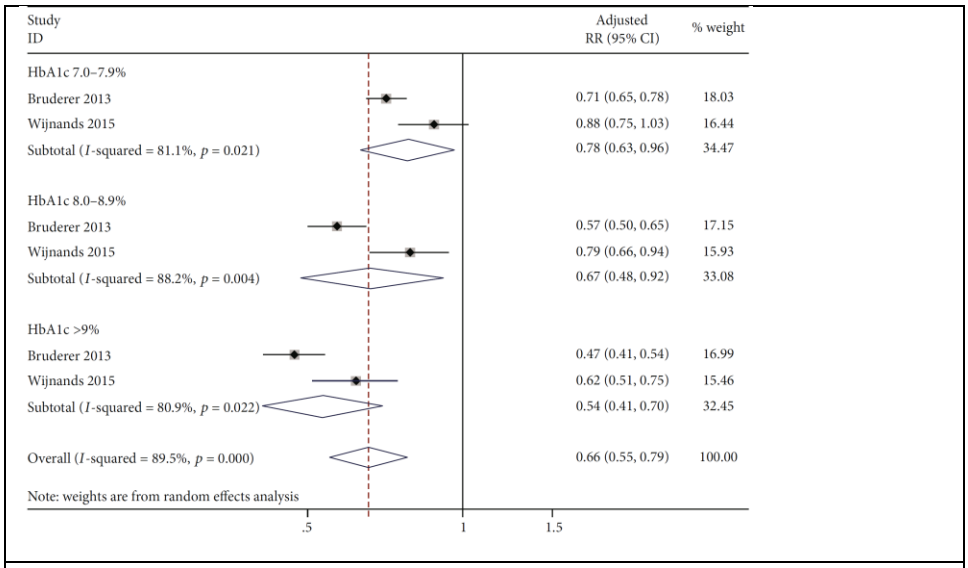


Figure: Forest plot of association between HbA1c level and the risk of gout. HbA1c: glycated hemoglobin; RR: relative risk; CI: confidence interval.

Furthermore, when stratified according to gender in DM, sex-specific association was found. The inverse association was observed in males only (aRR: 0.57; 95% CI: 0.43 to 0.77) and not in females (aRR: 0.96; 95% CI: 0.87 to 1.05). Further stratified based on glycated hemoglobin (HbA1c) levels in DM, raised A1C levels were associated with a reduced risk of gout in patients with DM.

This meta-analysis suggested that DM reduced the future risk of gout and the protective effect was stronger in males, T1DM, or DM with a high HbA1c level. The substantial role of the uricosuric effect of glycosuria and the impaired inflammatory response might offer potential mechanisms. These findings may appear counterintuitive, but it is not contradictory to emphasize the prevention of DM and gout simultaneously. Gout should be prevented by dietary adjustments or treating hyperuricemia rather than by focusing on DM. Diabetes professionals should be aware of the relationship between DM

and gout, especially in patients with well-controlled DM. These evidences might even change the treatment strategy of diabetic patients to use uric acid-lowering drugs more aggressively.

Source: Li X et al. J Diabetes Res. 2020. ID 5470739: 1-12.
https://doi.org/10.1155/2020/5470739