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Central hemodynamics and arterial health research insights

Metabolic Diseases Edition

**2297 papers and abstracts**  
published between 2008-2024\*

Here are some of the highlights.

## Vascular Biomarkers Indicate | October 2020 Diabetes Complications

### Carotid-Femoral Pulse Wave Velocity as a Risk Marker for Development of Complications in Type 1 Diabetes Mellitus

Individuals with type 1 diabetes have a reduced life expectancy which can be associated to the increased risk of cardiovascular disease and chronic kidney disease. A team led by Tougaard investigated 633 adults to determine if arterial stiffness markers are predictive biomarkers for complications in type 1 diabetes. Their results showed indeed arterial stiffness, associated with complications in type 1 diabetes mellitus, including albuminuria progression, decline in kidney function and cardiovascular events. Implementing vascular health assessments can inform personalized intervention to prevent such complications.



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## Vascular Aging in Prediabetics | May 2022

### Detection of Early Ultrasonographic Markers of Cardiovascular Dysfunction in Prediabetes Patients

Glucose intolerance, dyslipidemia, and long-term oxidation of fatty acids due to hyperglycemia may also contribute to reduction of cardiac and vascular function. Firmino and colleagues assessed 80 adults and found that prediabetes individuals showed higher rates of dyslipidemia and early signs of impaired cardiac and vascular function compared to healthy individuals. They have arterial stiffness. Both ultrasonographic markers of cardiac dysfunction and early vascular aging are more prevalent in prediabetes patients. This indicates the need for active vascular screening and treatment, especially when considering preventive measures for cardiovascular outcomes, like diabetic cardiomyopathy.



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## Central Blood Pressure | December 2022 a Key Risk Predictor

### Markers of subclinical vascular damage in young adults with type 1 diabetes mellitus: the role of central blood pressure

Diabetes is a chronic disease leading to cardiovascular complications that can be diagnosed early as subclinical vascular damage. Marcon and colleagues investigated cardiovascular risk factors and subclinical arterial damage in young adults with Type 1 diabetes (T1D), finding associations between central blood pressure (cBP) and vascular damage. Their results suggest that cBP is a superior to peripheral blood pressure marker to predict vascular damage and future cardiovascular events. The results show that central vascular biomarkers can provide early indications of cardiovascular decline, enabling early preventative treatment to limit cardiovascular complications.



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## Beyond Diet: Vascular Health in Youth | February 2021 with Diabetes

### Association between diet quality indices and arterial stiffness in youth with type 1 diabetes: SEARCH for Diabetes in Youth Nutrition Ancillary Study

A research group at the Cincinnati Children's Hospital Medical Center found in youth that the quality of diet in youth and young adults with type 1 diabetes was moderate to poor, but it was not directly linked to arterial stiffness, suggesting that diet quality may not be a standalone risk factor for arterial stiffening in this population. This study indicates that preventative treatment to improve vascular health must go beyond diet to reduce the risk of early vascular aging.



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## Adipokines Effect on | March 2023 Vascular Health

### High Serum Adipocyte Fatty Acid Binding Protein Levels Associated with Aortic Stiffness in Geriatric Persons with Type 2 Diabetes Mellitus

Recent studies have found that adipocyte fatty acid binding protein (A-FABP) plays a role in controlling metabolism and is linked to conditions like metabolic disorders, type 2 diabetes, and atherosclerosis. A research team led by Tseng studied 156 type 2 diabetics. The results found a positive association between serum A-FABP and vascular biomarkers. High aortic stiffness was linked to individuals that had higher blood pressure, and lower kidney function. Targeted treatment of A-FABP could reduce elevated vascular indices and therefore reduce cardiovascular risk in diabetic patients.



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## Advanced glycation end | March 2024 products and vascular aging in youth

### Accumulation of advanced glycation end products in skin and increased vascular ageing in the general population: the Malmö Offspring Study

Advanced glycation end products (AGEs) are potentially toxic proteins that become glycated after contact with sugars which are known risk marker in diabetic vascular disease, and associated with the degree of diabetes complications, renal failure, and atherosclerosis. A group led by Amra from Lund university assessed 2518 young adults. They showed a strong positive association between AGEs found in skin and vascular biomarkers (augmentation index and pulse wave velocity) independent of cardiometabolic risk factors. These results advocate that reducing dietary intake of AGEs could reduce aortic stiffness.



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## Incretin-Based Therapies Improve Vascular Function in Diabetics | March 2016

### Dipeptidyl peptidase-4 inhibitors improve arterial stiffness, blood pressure, lipid profile and inflammation parameters in patients with type 2 diabetes mellitus

Current therapeutic strategies targeting insulin resistance have not shown evidence of reducing cardiovascular risk in diabetes patients, prompting the search for alternative therapies. Blaslov and Duvnjak investigated the effects of incretin-based treatments, such as GLP-1 agonists and SPP-4 inhibitors on vascular biomarkers. They found that this treatment significantly reduced all vascular biomarkers (augmentation index, pulse wave velocity central blood pressure) in less than 6 weeks. Combining incretin and metformin therapy resulted in reductions in waist circumference, triglycerides, LDL, and total cholesterol. Using incretin-based treatment improved vascular function reducing cardiovascular risk in diabetics.

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