



A LARGE PROPORTION OF PATIENTS WITH DIABETES DIE AS A RESULT OF CARDIOVASCULAR DISEASES

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Annotation: Diabetes mellitus is one of the most widespread chronic diseases worldwide, and its complications remain a major cause of morbidity and mortality. Among these complications, cardiovascular diseases (CVDs) are the leading cause of death in diabetic patients. Numerous studies have demonstrated that people with diabetes are two to four times more likely to develop coronary artery disease, stroke, and peripheral vascular disease compared to those without diabetes. The underlying mechanisms involve a combination of hyperglycemia, insulin resistance, dyslipidemia, oxidative stress, and chronic inflammation, all of which contribute to endothelial dysfunction and atherosclerosis.

In diabetic individuals, prolonged high blood glucose levels damage blood vessels and the heart muscle, accelerating the development of atherosclerotic plaques. As a result, the risk of myocardial infarction, heart failure, and sudden cardiac death significantly increases. Moreover, hypertension and obesity, which often accompany diabetes, further worsen cardiovascular outcomes. Preventive strategies such as maintaining optimal blood sugar levels, adopting a balanced diet, engaging in regular physical activity, and using appropriate medications like statins and antihypertensives are crucial to reducing cardiovascular risk in diabetic patients.

Early detection and management of both diabetes and its cardiovascular complications are essential to improve quality of life and life expectancy. Physicians should emphasize patient education, regular monitoring, and lifestyle modifications to minimize long-term damage. In conclusion, most deaths among diabetic patients



are not due to hyperglycemia itself but to cardiovascular complications. Therefore, a comprehensive, multidisciplinary approach focusing on cardiovascular protection is fundamental in diabetes care and management.

Keywords *Diabetes mellitus, cardiovascular diseases, hyperglycemia, insulin resistance, atherosclerosis, heart failure, hypertension, obesity, prevention, risk factors, mortality.*

Introduction

Diabetes mellitus is a chronic metabolic disorder characterized by high blood glucose levels resulting from defects in insulin secretion, insulin action, or both. Over the past few decades, diabetes has emerged as one of the most significant global health problems, affecting millions of people worldwide. According to the World Health Organization (WHO), the number of adults living with diabetes has more than quadrupled in the last 40 years, primarily due to changes in lifestyle, unhealthy diets, and increasing obesity rates. The condition not only affects glucose metabolism but also has profound effects on multiple organs and systems, making it a major contributor to disability and premature death.

One of the most serious and life-threatening complications of diabetes is cardiovascular disease (CVD). Research indicates that diabetic patients have a substantially higher risk of developing heart-related disorders such as coronary artery disease, myocardial infarction, stroke, and peripheral artery disease. In fact, the majority of deaths among diabetic patients occur as a result of cardiovascular complications rather than direct metabolic disturbances. Persistent hyperglycemia leads to oxidative stress, endothelial dysfunction, lipid abnormalities, and chronic inflammation, which together accelerate the process of atherosclerosis and increase cardiovascular risk.

Furthermore, factors such as hypertension, obesity, sedentary lifestyle, and poor dietary habits commonly coexist with diabetes, amplifying the likelihood of cardiovascular events. The link between diabetes and cardiovascular diseases represents a critical challenge for healthcare systems worldwide, emphasizing the need for early diagnosis, effective treatment, and preventive strategies. Managing



blood sugar levels alone is not sufficient; comprehensive care should also target cardiovascular protection through lifestyle modifications, pharmacological therapy, and patient education.

Therefore, understanding the pathophysiological connection between diabetes and cardiovascular diseases is crucial for developing better therapeutic approaches and improving patient outcomes. This study highlights the relationship between diabetes and cardiovascular mortality, emphasizing the importance of integrated management strategies to reduce the global burden of both conditions.

Discussion

The relationship between diabetes mellitus and cardiovascular diseases is complex and multifactorial. Chronic hyperglycemia causes structural and functional changes in the blood vessels, leading to endothelial dysfunction and accelerated atherosclerosis. These pathophysiological alterations significantly increase the risk of coronary artery disease, myocardial infarction, and stroke among diabetic patients. Moreover, insulin resistance and dyslipidemia, which are common in type 2 diabetes, contribute to the accumulation of low-density lipoprotein (LDL) cholesterol in arterial walls, further promoting plaque formation and vascular inflammation.

Studies have shown that more than half of all diabetic deaths are due to cardiovascular complications. This highlights the importance of addressing not only glucose control but also cardiovascular risk factors such as hypertension, obesity, smoking, and sedentary behavior. In clinical practice, the management of diabetic patients requires a comprehensive approach that integrates lifestyle interventions, pharmacological treatment, and regular monitoring. Lifestyle modifications such as a balanced diet, weight reduction, and regular physical activity improve both glycemic control and cardiovascular health.

Pharmacological therapy also plays a key role. The use of statins, antihypertensive agents, and antiplatelet drugs has been proven to significantly reduce the risk of cardiovascular events in diabetic individuals. In addition, newer antidiabetic medications, including SGLT2 inhibitors and GLP-1 receptor agonists,



have demonstrated cardiovascular protective effects beyond glucose lowering. This represents a major advancement in modern diabetes management.

Despite these developments, many patients still fail to achieve optimal control due to poor adherence, lack of awareness, or limited access to healthcare. Therefore, patient education, routine check-ups, and early detection of complications are vital components of long-term care. Multidisciplinary collaboration between endocrinologists, cardiologists, and dietitians can further enhance treatment outcomes.

In conclusion, the prevention and control of cardiovascular diseases among diabetic patients must be prioritized in both clinical and public health settings. By combining medical therapy, lifestyle modification, and continuous education, it is possible to significantly reduce the global burden of diabetes-related cardiovascular mortality.

Literature Review:

The relationship between diabetes mellitus and cardiovascular diseases (CVDs) has been extensively studied in recent decades, and numerous research findings confirm that diabetes is a major independent risk factor for cardiovascular morbidity and mortality. According to the World Health Organization (2023), nearly 50% of deaths among people with diabetes result from cardiovascular complications. This emphasizes the need for deeper understanding and improved preventive strategies.

Emerging evidence shows that chronic hyperglycemia contributes to endothelial dysfunction, oxidative stress, and systemic inflammation, all of which promote the development of atherosclerosis. A study by Zheng et al. (2018) in *The Lancet* highlighted that individuals with diabetes are two to four times more likely to experience heart disease or stroke compared to non-diabetic individuals. Furthermore, the UK Prospective Diabetes Study (UKPDS) demonstrated that strict control of blood glucose and blood pressure significantly reduces the risk of cardiovascular events in type 2 diabetic patients.



Another important finding was reported by Rawshani et al. (2017) in the *New England Journal of Medicine*, who concluded that although improvements in diabetes care have reduced mortality, cardiovascular risk remains markedly elevated compared to the general population. Similarly, American Diabetes Association (ADA, 2024) guidelines recommend comprehensive risk management—including lipid-lowering, antihypertensive therapy, smoking cessation, and healthy diet—to prevent CVDs in diabetic patients.

Recent pharmacological advances have also transformed the approach to diabetes treatment. For instance, SGLT2 inhibitors (such as empagliflozin) and GLP-1 receptor agonists (like liraglutide) have demonstrated not only glycemic benefits but also significant reductions in cardiovascular mortality. These outcomes were confirmed by large clinical trials such as EMPA-REG OUTCOME and LEADER studies.

Overall, the literature consistently indicates that cardiovascular disease remains the leading cause of death among diabetic individuals. Despite medical progress, a significant global health gap persists, requiring integrated prevention, early intervention, and long-term patient education. Continuous research is therefore essential to better understand the molecular mechanisms linking diabetes and cardiovascular pathology and to develop innovative treatment strategies for future care.

Conclusion

In summary, diabetes mellitus is not only a metabolic disorder but also a major cardiovascular risk factor that significantly increases mortality rates worldwide. The majority of deaths among diabetic patients are attributed to cardiovascular complications such as coronary artery disease, myocardial infarction, and stroke. Chronic hyperglycemia, insulin resistance, and lipid abnormalities create a pathological environment that accelerates vascular damage and atherosclerosis.

Effective management of diabetes must therefore extend beyond glycemic control to include comprehensive cardiovascular risk reduction. Early diagnosis, lifestyle modification, and consistent medical supervision are essential strategies for



improving long-term outcomes. Pharmacological interventions—such as the use of statins, antihypertensive agents, and cardioprotective antidiabetic drugs—further contribute to reducing mortality and morbidity.

Furthermore, increasing patient awareness and promoting healthy behaviors are vital in preventing complications. Collaborative care involving multiple healthcare professionals ensures that treatment is both holistic and individualized. Ultimately, prioritizing cardiovascular health within diabetes management will not only prolong life expectancy but also enhance the quality of life for millions of individuals living with this condition.

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