

The Impact of Diabetes Mellitus on Cardiovascular Health

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Abstract: Diabetes mellitus (DM) is one of the most prevalent metabolic disorders globally, characterized by chronic hyperglycemia resulting from defects in insulin secretion, insulin action, or both. This study aims to evaluate the effects of DM on cardiovascular health and to highlight the preventive measures and therapeutic strategies. Our findings indicate that uncontrolled diabetes significantly increases the risk of cardiovascular complications, including myocardial infarction, stroke, and heart failure. Early detection and glycemic control play pivotal roles in mitigating these risks.

Keywords: Diabetes mellitus, cardiovascular diseases, hyperglycemia, diabetic nephropathy, complications.

Introduction

Diabetes mellitus (DM) is a chronic condition with rising global prevalence, affecting millions of individuals. The International Diabetes Federation (IDF) reported that over 537 million adults were living with diabetes in 2021, with this figure expected to rise to 643 million by 2030. DM is a major risk factor for cardiovascular diseases (CVD), which are the leading cause of mortality among diabetic patients. Hyperglycemia, along with associated dyslipidemia and hypertension, accelerates atherosclerosis and endothelial dysfunction. This study explores the interplay between diabetes and cardiovascular health, emphasizing the importance of glycemic control and multidisciplinary management.

Materials and Methods

A retrospective cohort study was conducted on 200 patients aged 40–70 years diagnosed with type 2 diabetes mellitus (T2DM) at Samarkand State Medical University Hospital. Clinical, laboratory, and imaging data were analyzed to assess the incidence of cardiovascular complications. Patients were divided into two groups based on their glycemic control (HbA1c <7% vs. HbA1c ≥7%). Statistical analysis was performed using SPSS version 25.

Results

- **Cardiovascular Complications:** Among 200 participants, 68% of patients with HbA1c ≥7% developed CVD, compared to 35% in the HbA1c <7% group.
- **Diabetic Nephropathy:** 28% of participants with poor glycemic control exhibited microalbuminuria, an early marker of nephropathy.
- **Risk Factors:** Hypertension was prevalent in 70% of participants with poor glycemic control, further exacerbating cardiovascular risks.

The study demonstrates a strong association between poor glycemic control and cardiovascular complications. Hyperglycemia exacerbates oxidative stress, inflammation, and lipid abnormalities, which collectively accelerate the progression of atherosclerosis. The data underscore the need for comprehensive management strategies, including:

1. Intensive glycemic control with medications like metformin and SGLT2 inhibitors.
2. Regular cardiovascular screenings for early detection of complications.
3. Lifestyle modifications, such as a balanced diet, increased physical activity, and smoking cessation.

Multidisciplinary care involving endocrinologists, cardiologists, and nephrologists is crucial to improving patient outcomes.

Conclusion

Diabetes mellitus significantly impacts cardiovascular health, underscoring the necessity of early diagnosis and effective management. Comprehensive glycemic control, along with regular monitoring and preventive measures, can mitigate the risks of cardiovascular complications, improving the quality of life and survival rates among diabetic patients.

References

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