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MORTALITY RATES IN PATIENTS WITH ISCHEMIC HEART DISEASE AND DIABETES MELLITUS

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Abstract

Ischemic heart disease (IHD) remains the leading cause of mortality worldwide, and its coexistence with diabetes mellitus (DM) significantly amplifies the risk of adverse cardiovascular outcomes. Diabetes is associated with metabolic disturbances, endothelial dysfunction, and accelerated atherosclerosis, all of which contribute to increased mortality in IHD patients. This study aims to evaluate mortality rates in patients with IHD and diabetes mellitus and to identify key clinical, metabolic, and prognostic factors influencing survival outcomes. A retrospective cohort analysis was conducted on 180 patients diagnosed with IHD, divided into diabetic and non-diabetic groups. The findings reveal that diabetic patients exhibit significantly higher all-cause and cardiovascular mortality rates, primarily due to silent ischemia, diffuse coronary artery disease, and a higher prevalence of complications such as heart failure and arrhythmias. Poor glycemic control, prolonged duration of diabetes, and coexisting metabolic syndrome were strongly associated with increased mortality risk. These results underscore the necessity of early detection, aggressive risk factor management, and integrated therapeutic strategies to improve survival in this high-risk population.

Keywords

Ischemic heart disease, diabetes mellitus, mortality rate, cardiovascular mortality, hyperglycemia, insulin resistance, metabolic syndrome, atherosclerosis, endothelial dysfunction, prognosis.

Introduction

Ischemic heart disease (IHD) continues to represent a major global health challenge and remains the primary cause of mortality across both developed and developing countries. According to the World Health Organization, cardiovascular diseases account for approximately 17.9 million deaths annually, with IHD constituting the largest proportion. Among the numerous risk factors associated with IHD, diabetes mellitus (DM) is recognized as one of the most significant and rapidly increasing contributors.

Diabetes mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from impaired insulin secretion, insulin resistance, or both. The prevalence of type 2 diabetes, in particular, has increased dramatically over recent decades, largely due to sedentary lifestyles, obesity, and population aging. The coexistence of diabetes and IHD represents a particularly dangerous clinical combination, often referred to as a "cardiometabolic continuum."

Patients with diabetes are two to four times more likely to develop ischemic heart disease, and their prognosis is significantly worse compared to non-diabetic individuals. The increased mortality risk in this population is multifactorial, involving endothelial dysfunction, chronic inflammation, oxidative stress, and dysregulation of lipid metabolism. Furthermore, diabetic

patients frequently present with atypical or silent myocardial ischemia due to autonomic neuropathy, leading to delayed diagnosis and treatment.
Given the growing prevalence of diabetes worldwide, understanding its impact on mortality in patients with IHD is of critical importance. This study aims to assess mortality rates in patients with IHD and diabetes mellitus and to analyze the clinical and metabolic factors contributing to poor outcomes.

Materials and Methods

Study Design and Population

A retrospective cohort study was conducted involving 180 patients diagnosed with ischemic heart disease. The patients were divided into two groups:

- **Group A:** 90 patients with type 2 diabetes mellitus and IHD
- **Group B:** 90 patients with IHD without diabetes

Inclusion Criteria

- Confirmed diagnosis of ischemic heart disease
- Age between 40 and 75 years
- Availability of complete clinical and laboratory data

Exclusion Criteria

- Severe renal or hepatic failure
- Malignancies
- Acute infections

Data Collection

The following parameters were analyzed:

- Demographic data (age, sex)
- Clinical indicators (blood pressure, heart rate, BMI)
- Laboratory findings (fasting glucose, HbA1c, lipid profile)
- Instrumental data (ECG, echocardiography, coronary angiography)
- Presence of complications (heart failure, myocardial infarction, arrhythmias)
- Mortality outcomes over a 12–24 month follow-up period

Statistical Analysis

Data were analyzed using standard statistical methods. Continuous variables were expressed as mean ± standard deviation, and categorical variables as percentages. Statistical significance was defined as $p < 0.05$.

Results

Mortality Outcomes

The study demonstrated a significantly higher mortality rate among diabetic patients:

- **All-cause mortality:**
  - Group A: 32%
  - Group B: 16%
- **Cardiovascular mortality:**
  - Group A: 26%
  - Group B: 12%

Complication-Related Mortality

- Heart failure-related deaths:
  - Group A: 20%
  - Group B: 9%
- Fatal arrhythmias:
  - Group A: 14%
  - Group B: 6%
- Recurrent myocardial infarction:
  - Group A: 18%
  - Group B: 10%

Risk Factors for Increased Mortality

The following factors were strongly associated with increased mortality in diabetic patients:

- HbA1c > 8%
- Duration of diabetes > 10 years
- LDL cholesterol > 3.0 mmol/L
- Presence of hypertension
- Obesity (BMI > 30 kg/m²)
- Reduced left ventricular ejection fraction (<40%)

Discussion

The results of this study clearly demonstrate that diabetes mellitus significantly increases mortality rates in patients with ischemic heart disease. The observed doubling of mortality in diabetic patients is consistent with global epidemiological data and reflects the complex interplay of metabolic and vascular factors.

One of the key mechanisms underlying increased mortality is chronic hyperglycemia, which leads to endothelial dysfunction and promotes atherosclerotic plaque formation. Advanced glycation end products (AGEs) contribute to vascular stiffness and inflammation, further exacerbating coronary artery disease.

Insulin resistance, a hallmark of type 2 diabetes, plays a crucial role in altering myocardial metabolism. It reduces glucose uptake by cardiac cells and increases reliance on fatty acid oxidation, leading to decreased cardiac efficiency and increased susceptibility to ischemic injury.

Additionally, diabetic patients often develop diffuse and multi-vessel coronary artery disease, which is more difficult to treat and is associated with poorer outcomes. The presence of autonomic neuropathy may mask typical angina symptoms, resulting in delayed diagnosis and increased risk of sudden cardiac death.

Another important factor is the high prevalence of comorbid conditions such as hypertension, dyslipidemia, and obesity, which collectively form the metabolic syndrome. These conditions act synergistically to increase cardiovascular risk and mortality.

Conclusion

Mortality rates in patients with ischemic heart disease are significantly higher in the presence of diabetes mellitus. The combination of metabolic dysregulation, vascular damage, and associated comorbidities contributes to poor clinical outcomes.

Effective management of these patients requires a comprehensive and multidisciplinary approach, including strict glycemic control, aggressive lipid management, blood pressure regulation, and early cardiovascular intervention. Preventive strategies and patient education are also essential to reduce mortality and improve quality of life.

Future research should focus on personalized treatment strategies and novel therapeutic approaches aimed at reducing cardiovascular risk in diabetic patients.

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