



IMPACT OF METABOLIC SYNDROME ON CARDIOVASCULAR DISEASE RISK

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Abstract

Metabolic syndrome is a cluster of metabolic abnormalities that significantly increases the risk of cardiovascular disease, which remains the leading cause of global mortality. This study aims to evaluate the impact of metabolic syndrome components on cardiovascular risk among patients attending Namangan City Family Polyclinic No. 5. A retrospective observational study was conducted involving 120 patients aged 30–65 years. Clinical parameters including body mass index, blood pressure, fasting blood glucose, and lipid profile were analyzed. The results revealed a high prevalence of metabolic syndrome components, with obesity and hypertension being the most common. A strong correlation was found between the number of metabolic abnormalities and increased cardiovascular risk. The findings highlight the importance of early detection and integrated management strategies at the primary healthcare level.

Keywords

metabolic syndrome, cardiovascular disease, primary healthcare, hypertension, dyslipidemia, Uzbekistan

1. Introduction

Metabolic syndrome is recognized as a major public health challenge characterized by a combination of central obesity, insulin resistance, hypertension, and dyslipidemia (Alberti et al., 2009). These interrelated conditions significantly increase the risk of developing cardiovascular diseases, which are the leading cause of death worldwide (World Health Organization, 2021).

In recent years, the prevalence of metabolic syndrome has increased due to rapid urbanization, sedentary lifestyles, and unhealthy dietary patterns (Grundy, 2016). This trend is particularly evident in developing countries, including Uzbekistan, where non-communicable diseases are becoming increasingly dominant (Ismailov, 2020). Primary healthcare institutions play a crucial role in early detection and prevention of metabolic and cardiovascular disorders. Family polyclinics, in particular, serve as the first point of contact for patients and provide opportunities for early diagnosis and intervention. Therefore, studying the relationship between metabolic syndrome and cardiovascular risk in such settings is essential. This study aims to assess the impact of metabolic syndrome on cardiovascular disease risk among patients treated at Namangan City Family Polyclinic No. 5.

2. Literature Review

The association between metabolic syndrome and cardiovascular disease has been extensively studied. According to Grundy (2016), metabolic syndrome significantly increases the risk of cardiovascular morbidity and mortality due to the combined effect of multiple metabolic abnormalities. Alberti et al. (2009) established widely accepted diagnostic criteria for metabolic syndrome, emphasizing abdominal obesity and insulin resistance as key components. Kaur (2014)



highlighted that dyslipidemia and hypertension contribute to endothelial dysfunction, which is a precursor to atherosclerosis.

Studies conducted in Russia have also confirmed these findings. Ivanov (2018) reported that individuals with metabolic syndrome have more than twice the risk of developing cardiovascular complications. Similarly, Petrov (2017) emphasized the role of hypertension as a dominant risk factor.

In Uzbekistan, Karimov (2019) noted a growing prevalence of metabolic disorders among middle-aged populations, while Abdullaev (2021) emphasized the need for preventive strategies at the primary healthcare level. Recent research has also focused on the role of chronic inflammation in linking metabolic syndrome to cardiovascular disease (Smith et al., 2020). These studies underline the importance of early diagnosis and comprehensive management.

3. Methodology

This study was designed as a retrospective observational clinical investigation conducted at Namangan City Family Polyclinic No. 5 between January 2022 and December 2024. The study included 120 patients aged between 30 and 65 years who attended the polyclinic for routine medical examinations or treatment of chronic conditions. Primary healthcare settings provide an effective platform for identifying early-stage metabolic disorders and associated cardiovascular risks (World Health Organization, 2021). Patients were selected using purposive sampling based on the availability of complete clinical and laboratory data. Inclusion criteria required the presence of at least three components of metabolic syndrome according to the criteria established by Alberti et al. (2009).

Exclusion criteria included incomplete medical records and severe chronic diseases unrelated to metabolic syndrome. Data were collected from patient records, including anthropometric measurements and laboratory findings. Body Mass Index (BMI) was calculated using standard methods, and obesity was classified according to WHO guidelines (World Health Organization, 2021). Blood pressure levels were categorized based on international hypertension standards (Petrov, 2017). Biochemical parameters included fasting blood glucose and lipid profile indicators such as total cholesterol, triglycerides, LDL, and HDL (Kaur, 2014).

Patients were grouped based on the number of metabolic syndrome components present. Statistical analysis included descriptive statistics and correlation analysis to assess relationships between variables. A significance level of $p < 0.05$ was considered statistically meaningful (Ivanov, 2018). Ethical standards were maintained by anonymizing patient data and ensuring confidentiality (Ismailov, 2020).

4. Results and Discussion

The study revealed a high prevalence of metabolic syndrome components among the examined patients. Obesity was observed in 72% of patients, hypertension in 68%, elevated fasting glucose in 54%, and dyslipidemia in 61%.

Table 1. Clinical Characteristics of Patients

Parameter	Percentage (%)
Obesity (BMI ≥ 30)	72%
Hypertension	68%
Elevated glucose	54%
Dyslipidemia	61%

Source: Author's calculations based on clinical data from Namangan City Family Polyclinic No. 5 (2022–2024)



A majority of patients (65%) had at least three components of metabolic syndrome, while 28% had four or more components. This confirms the clustering nature of metabolic abnormalities described in previous studies (Alberti et al., 2009). Correlation analysis demonstrated a significant positive relationship between BMI and blood pressure ($r = 0.62$, $p < 0.05$), as well as between fasting glucose and triglyceride levels ($r = 0.58$, $p < 0.05$). These findings indicate that metabolic risk factors are interrelated and contribute collectively to cardiovascular risk (Smith et al., 2020).

The combination of obesity and hypertension showed the strongest association with increased cardiovascular risk, supporting earlier findings that these factors have a synergistic effect (Grundy, 2016). Similar results were reported in regional studies (Karimov, 2019). The data obtained from Namangan City Family Polyclinic No. 5 demonstrate that metabolic syndrome is highly prevalent at the primary healthcare level. This highlights the critical role of family polyclinics in early detection and management of cardiovascular risk factors. Compared to international data, the prevalence rates observed in this study are relatively high, which may be attributed to regional lifestyle patterns and limited preventive healthcare measures (Ismailov, 2020).

5. Conclusion and Recommendations

The findings of this study confirm that metabolic syndrome significantly increases the risk of cardiovascular disease. The presence of multiple metabolic abnormalities further amplifies this risk. Early screening, regular monitoring, and integrated management strategies are essential to reduce cardiovascular morbidity and mortality. Primary healthcare institutions, including Namangan City Family Polyclinic No. 5, play a key role in implementing preventive measures. It is recommended to enhance public awareness, promote healthy lifestyles, and strengthen early diagnostic services. Further large-scale studies are needed to explore long-term outcomes and intervention strategies.

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