

# EXPRESSION OF METALLOPROTEINASES IN ATHEROSCLEROTIC PLAQUES IN DIABETIC AND NON-DIABETIC PATIENTS

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**Relevance.** MMP-1, MMP-2,  $\alpha$ -SMA, and CD68 are linked to weaker plaques that can break more easily. These proteins play a role in breaking down plaque and may increase the risk of thrombosis. Therefore the main aim of this study was to analyze the variation of distribution of the morphological and immunohistochemical changes in the coronary vessels with atherosclerotic plaque in diabetic and non-diabetic patients.

**Target.** The analyze the variation of distribution of the morphological and immunohistochemical changes in the coronary vessels with atherosclerotic plaque in diabetic patients.

**Research methods.** Coronary artery atherosclerotic plaques from diabetic and non-diabetic patients were analysed using immunohistochemical staining, revealing the presence of CD68, MMP-1, MMP-9, and  $\alpha$ -SMA. Patient data was collected from the cardiology departments of several hospitals in Minsk. The corresponding stained pathological slides, used for immunohistochemical analysis, were obtained from the Pathological Anatomical Bureau of Minsk. This allowed for the correlation of clinical information with pathological findings. Quantitative analysis of expression was performed using the programme Aperio Image Scope 12.4.6 and calculation of the ratio of positive markers to the total number of markers present, thereby determining the overall positivity for each marker.

**Results and their discussion.** Statistical analysis revealed a correlation between the presence of diabetes mellitus (type 1 or type 2) and MMP-1 expression. However, when comparing the mean expression values of all markers in the groups of patients with the presence or absence of DM, as well as depending on the degree of DM compensation, no significant differences were found. The degree of expression of both types of metalloproteinases depended on the degree of atherosclerotic plaque stability. Thus, in the lipid core and fibrous cover of large unstable atherosclerotic plaques there was more significant expression of MMP-1 and MMP-9. This probably determines a higher risk of rupture of such plaque as a result of degradation of extracellular matrix components. The level of MMP-1 expression was also higher in atherosclerotic plaques in patients who died of acute myocardial infarction. The analysis revealed no statistically significant correlation between the presence of  $\alpha$ -SMA and CD68 and the severity of atherosclerotic plaques in the examined diabetic patients. In other words,  $\alpha$ -SMA and CD68 levels did not consistently increase or decrease with worsening plaque.

**Conclusions.** Significant expression of metalloproteinases (MMP-1 and MMP-9) results in more active degradation of extracellular matrix components, increases a risk of rupture of atherosclerotic plaques fibrous cover and makes them less stable [1].

#### LITERATURE

1. Falk, E. Pathogenesis of atherosclerosis / E. Falk // Journal of the American College of Cardiology. – 2006. – Vol. 47, № 8, Suppl. – P. C7–C12. – Mode of access: <https://doi.org/10.1016/j.jacc.2005.09.068>.

## THE IMPACT OF CENTRALIZED HEALTHCARE FUNDING ON MATERNAL MORTALITY: BELARUS VS NIGERIA

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**Relevance.** Maternal mortality remains a critical global health challenge, with vast gap between nations. The structure and financing of a healthcare system are fundamental determinants of maternal health outcomes. Understanding how different funding models influence these outcomes is essential for developing effective health policies. This study compares Belarus, which employs a centralized, state-funded system, with Nigeria, which has a fragmented and resource-constrained model, to highlight the impact of these differences.

**Target.** To conduct a comparative analysis of maternal healthcare delivery and outcomes in Belarus and Nigeria. The primary objective is to examine how centralized funding affects the maternal mortality rate (MMR) by analyzing the organization of services across primary, secondary, and tertiary care levels in relation to each country's health expenditure as a percentage of Gross Domestic Product (GDP).

**Research methods.** This research is a comparative analysis based on a synthesis of epidemiological and economic data. Data on maternal mortality ratios (MMR) and current health expenditure (% of GDP) for Belarus and Nigeria from 2017 to 2023 were sourced from World Bank and WHO databases [1]. The study compares these statistical trends against the structural organization of each nation's maternal health system.

**Results and their discussion.** The analysis reveals Belarus's centralized system, funded by approximately 5.8-7.1% of GDP, features a mandatory, universal care pathway. All pregnancies are tracked from state-funded Women's Consultation Clinics (primary level) through clear referral to secondary and tertiary hospitals, ensuring continuous monitoring and skilled attendance at birth. This integrated structure corresponds with a consistently low MMR of 1-2 per 100,000 live births. In contrast, Nigeria's fragmented system allocates a lower percentage of its GDP (3.1-4.2%) to health. Its primary care tier is weak, with most facilities lacking 24/7 emergency