

CAUSES OF CANCER DEVELOPMENT AND MODERN THERAPEUTIC APPROACHES

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Abstract: *Cancer represents a major global health burden, with incidence and mortality rates steadily increasing, particularly in developing regions. This paper explores the multifactorial causes of cancer, emphasizing genetic susceptibility, environmental exposure, lifestyle determinants, and infectious agents. Special attention is given to regional cancer statistics in Central Asia, where late diagnosis and limited access to advanced therapies remain significant challenges. Modern therapeutic strategies, including surgery, chemotherapy, radiotherapy, targeted therapy, immunotherapy, and precision medicine, are discussed. Understanding regional epidemiological patterns alongside modern treatment modalities is critical for improving cancer outcomes.*

INTRODUCTION

Cancer is a heterogeneous group of diseases characterized by uncontrolled cellular proliferation and the potential for metastasis. In Central Asia, including Uzbekistan, cancer incidence has increased over the past decade, with lung, breast, and gastrointestinal cancers being the most prevalent (WHO, 2023). The etiology of cancer involves a complex interaction between genetic and external factors, making prevention and treatment particularly challenging.

Causes of Cancer Development

Genetic factors play a pivotal role in carcinogenesis through inherited and acquired mutations affecting oncogenes and tumor suppressor genes. Environmental and occupational exposures such as air pollution, industrial chemicals, and radiation significantly contribute to cancer risk in urbanized regions of Central Asia (IARC, 2020). Lifestyle factors, including tobacco use, poor nutrition, and physical inactivity, are increasingly prevalent and closely associated with cancer incidence. Infectious agents such as hepatitis B and C viruses remain major contributors to liver cancer in the region (Zur Hausen, 2009).

Modern Therapeutic Approaches

Surgical intervention remains the primary treatment for early-stage solid tumors. Chemotherapy and radiotherapy continue to be widely used, although their toxicity limits long-term outcomes. Targeted therapies and immunotherapy have shown promising results; however, access in Central Asia is limited due to cost and infrastructure constraints. Precision medicine, based on genomic profiling, represents a future-oriented approach with the potential to reduce mortality and improve survival rates (Collins & Varmus, 2015).

Conclusion

Cancer development is driven by multifactorial causes, requiring comprehensive prevention and treatment strategies. Incorporating regional epidemiological data into national cancer control programs is essential.

Expanding access to modern therapies and early diagnostic tools in Central Asia could significantly improve patient outcomes.

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