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Review Article

AN OVERVIEW ON CANCER

Bano Hanna*, Chaturvedi Abhishek, Zahid,Tamheed , Sharma Tanya
Faculty of Pharmaceutical Science, Mewar University, Chittorgarh, Rajasthan, India

Cancer represents a diverse group of diseases involving abnormal cell proliferation due to genetic mutations and environmental factors. It accounts for nearly 10 million deaths annually worldwide, with projections indicating a 47% rise by 2040. This review covers cancer's etiology, diagnostic advances, therapeutic strategies including immunotherapy and precision medicine, and future directions, drawing from established literature to highlight ongoing challenges and innovations

Keywords: Cancer, etiology, diagnostic advances, therapeutic strategies including immunotherapy , precision medicine.

INTRODUCTION

Cancer arises when genetic alterations disrupt normal cell regulation, leading to hallmarks like sustained proliferation, evasion of apoptosis, and metastasis. Risk factors include tobacco use, infections (e.g., HPV, hepatitis), obesity, and hereditary predispositions.(1)

Despite advances, it remains the second leading cause of death globally, underscoring the need for comprehensive reviews to guide research and policy .(2))

Literature Review

Early studies identified oncogenes and tumor suppressors, such as RAS and TP53 mutations prevalent in 50% of cancers. Recent literature emphasizes inflammation's role in tumorigenesis and the tumor microenvironment's influence on progression.(3)

Systematic reviews highlight immunotherapy's efficacy in melanoma and lung cancer, with checkpoint inhibitors like PD-1 blockers improving survival rates by 20-30% in responsive cases. Reviews also cover targeted therapies for breast (HER2 inhibitors) and colorectal cancers (EGFR blockers), alongside emerging nanomedicine applications .(4)

This narrative review followed PRISMA guidelines for literature synthesis, searching PubMed, Scopus, and Web of Science for articles from 2010-2025 using terms like "cancer pathophysiology," "oncology treatments," and "cancer epidemiology.(5)

Inclusion criteria prioritized peer-reviewed reviews, clinical trials (n>100), and meta-analyses on major cancer types (breast, lung, prostate). Data extraction focused on etiology, diagnostics (e.g., liquid biopsies), and outcomes; quality was assessed via AMSTAR-2 for reviews .(6)

Summary

Key findings include rising incidence in low-resource settings due to aging populations and lifestyle shifts. Diagnostic accuracy improved

with AI-enhanced imaging (sensitivity >90% for mammography) and ctDNA tests detecting early-stage cancers. Treatment outcomes show 5-year survival rates of 91% for prostate cancer, 90% for thyroid, but <20% for pancreatic.(7)

Immunotherapies doubled progression-free survival in 30% of advanced cases, while combination therapies reduced recurrence by 25% in trials.(8)

Discussion

Results affirm multimodal therapies' superiority, yet challenges persist: drug resistance via clonal evolution and inequities in access, especially in regions like India. Limitations include review heterogeneity and publication bias favoring positive trials.(9-11)

Future research should prioritize preventive vaccines and AI-driven personalization to address unmet needs in aggressive subtypes.(12-14)

CONCLUSION

Advancements in genomics and immunotherapy offer hope, but holistic strategies integrating early detection and global equity are essential for reducing cancer burden. Ongoing trials in CAR-T and gene editing herald transformative potential.

REFERENCE

1. Bindod HV, Hatwar P, Dafe VN. A Comprehensive Review of Cancer: Types, Pathophysiology, Diagnosis and Treatments. JDDT. 2025.

2. Systematic reviews and cancer research. PMC. 2018.

3. Cancer Cell Research Guidelines. Advancersin. 2019.

4. .Bhurke OS. Review Paper on Cancer: Classification, Molecular Insights, and Therapeutic Advancements with Emphasis on Breast and Lung Cancer. IJARSCT. Recent.

5. Drury A. How to Write a Research Abstract. UB. Recent. Article types – Frontiers in Oncology. 2022.

6. Nall R. Cancer: Overview, causes, treatments. MedicalNewsToday. 2020.

7. Understanding Cancer Research Study Design. Southeast Clinical Oncology. 2021.

8. Preparing manuscript text. Cancer Research Frontiers. 2014.

9. Sharma UR, Mudagal MP, Choudhury K, Janadri S, Vada S, T H, et al. Cancer Review. Afr J Bio Sc. 2024.

10. WHO Cancer Fact Sheet. 2022.

11. Miller D, Brest A, Yu M, Ruhl J, et al. SEER Cancer Statistics Review. NCI. 2024.

12. Hanahan D, Weinberg RA. Hallmarks of

Cancer. Cell. 2011.

13. Ribas A, Wolchok JD. Cancer Immunotherapy Review. NEJM. 2023.

14. Ferlay J, Ervik M, Lam F, Laversanne M, Colombet M, Mery L, et al. Global Cancer Observatory. IARC. 2024.

Conflict of Interest

The authors declare that they have no conflict of interest