

Cancer genetics and genetic counseling: Guiding risk and early detection

Shambhavi Singh*

Department of Medical Genetics, Fortis Hospital, New Delhi, India

*Correspondence to: Singh S, Department of Medical Genetics, Fortis Hospital, New Delhi, India, E-mail: 13shambhavisingh@gmail.com

Received: July 01, 2025; Manuscript No: JMBC-25-4994; Editor Assigned: July 03, 2025; PreQc No: JMBC-25-4994(PQ); Reviewed: July 10, 2025; Revised: July 15, 2025; Manuscript No: JMBC-25-4994(R); Published: July 30, 2025

Citation: Singh S (2025). Cancer genetics and genetic counseling: Guiding risk and early detection. J. Mol. Biol. Vol.1 Iss.1, July (2025), pp:4.

Copyright: Singh S 2025. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

DESCRIPTION

The integration of cancer genetics and genetic counseling into mainstream oncology has transformed the way we identify, manage, and prevent hereditary cancers. By understanding inherited mutations that increase cancer risk, healthcare providers can offer individuals and families personalized strategies for surveillance, prevention, and treatment, well before symptoms arise. An estimated 10–15% of cancers are hereditary, commonly associated with well-established syndromes such as Hereditary Breast and Ovarian Cancer (HBOC) and Lynch syndrome. These conditions are caused by germline mutations in genes like BRCA1, BRCA2, MLH1, and MSH2. Identifying such mutations early allows for timely interventions including risk-reducing surgeries, enhanced screening, and predictive testing for at-risk relatives. Genetic counseling plays a vital role in ensuring individuals understand the implications of genetic testing, both medically and emotionally. It enables informed decision-making, facilitates family communication, and helps manage the psychological impact of test results. Studies have shown that patients who undergo genetic counseling are more likely to engage in preventive measures and cascade testing for their families, ultimately leading to early diagnosis or prevention of cancer in relatives. Despite its benefits, cancer genetics remains underutilized due to barriers like limited awareness among clinicians, lack of access in certain regions, and cultural stigma. Expanding access to genetic services and embedding counseling into routine care pathways can help address these gaps. To bridge the existing gaps and fully harness the power of cancer genetics, a multi-tiered approach is essential. This involves integrating genetic risk assessment into standard oncology workflows, increasing provider education, and

developing infrastructure that supports both in-person and telehealth genetic services. Embedding genetic screening into routine evaluations for high-risk patients—such as those with early-onset cancer or a strong family history—can significantly increase detection rates of hereditary cancer syndromes. Public education campaigns are also crucial in reducing stigma and increasing awareness about the value of genetic testing and counseling. Empowering communities with accurate information can dispel myths, encourage early engagement, and promote acceptance of preventive strategies.

CONCLUSION

Cancer genetics, coupled with professional genetic counseling, empowers patients and families with knowledge that can save lives. Widespread adoption requires interdisciplinary collaboration, public and professional education, and policy-level support to ensure equitable access to these life-changing services. Expanding the reach of cancer genetics and genetic counseling holds the potential to transform cancer prevention, early detection, and treatment. To fully realize this potential, healthcare systems must foster stronger collaboration among oncologists, genetic counselors, primary care providers, and researchers. At the same time, raising awareness among the public about the benefits and availability of genetic testing is essential to encourage informed decision-making. Moreover, healthcare professionals need ongoing training to stay current with rapidly advancing genetic science and to integrate genetic insights into patient care effectively. Equitable access must also be prioritized—especially for underserved and rural populations—through supportive healthcare policies, insurance coverage, and accessible service delivery models such as tele-genetics.