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Review paper

Rising Incidence of Cancer Among Youth: Identification, Control, and Preventive Strategies

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ABSTRACT

The 'Cancer Mukt Bharat Foundation' has conducted a recent study revealing a significant rise in cancer incidence among the youth, specifically individuals aged 20 to 40. This research, led by a team of eminent oncologists, underscores a concerning trend: 20% of cancer patients seeking assistance through the Foundation's helpline from March 1 to May 15, 2024, fall within this youthful demographic. Of the 1,968 callers, 60% of the patients under 40 were men. The distribution of cancer types among these young patients is particularly alarming, with head and neck cancers comprising 26%, gastrointestinal cancers 16%, breast cancer 15%, and blood cancers 9%.

The data indicate a geographic concentration of helpline calls from Hyderabad, suggesting regional variances in cancer prevalence and awareness. In response to these findings, the 'Cancer Mukt Bharat Foundation' emphasizes the importance of early identification, control measures, and preventive strategies tailored to younger populations. The Foundation provides a crucial service by offering free second opinions to cancer patients, aiding in accurate diagnosis and appropriate treatment planning.

This paper highlights the urgent need for targeted cancer awareness and screening programs among the youth, alongside research into potential lifestyle and environmental factors contributing to this trend. Comprehensive strategies must include public health campaigns, enhanced access to diagnostic facilities, and personalized treatment protocols. Furthermore, a multidisciplinary approach involving healthcare providers, policymakers, and community organizations is essential to mitigate the rising cancer burden in young adults.

Finally, the study by 'The Cancer Mukt Bharat Foundation' serves as a clarion call for intensified efforts in cancer prevention and control among the youth. By identifying key demographic trends and cancer types, the Foundation's findings pave the way for strategic interventions aimed at reducing cancer incidence and improving outcomes for young patients across India.

1. Introduction

The study highlighting the increasing incidence of cancer among youth was conducted by the 'Cancer Mukt Bharat Foundation[1]. This organization, operated by a team of eminent oncologists, focuses on cancer prevention, treatment, and awareness in India[2]. The Foundation's initiatives include providing support and resources to cancer patients, conducting research to understand cancer trends, and developing effective strategies for combating the disease. One of their key services is running a helpline to assist cancer patients

and offering free second opinions to ensure accurate diagnosis and treatment planning.

The study specifically focuses on individuals aged 20 to 40, a demographic often underrepresented in cancer research, which typically emphasizes older populations. According to the findings, 20% of cancer patients seeking assistance through the Foundation's helpline during the period from March 1 to May 15, 2024, fall within this youthful age range. This significant percentage underscores the need for tailored cancer awareness and prevention programs aimed at younger adults, who are increasingly being diagnosed with various types of cancer.

2. Key Findings

The key findings from the study conducted by the 'Cancer Mukt Bharat Foundation' reveal a concerning rise in cancer cases among the youth. Statistical data gathered from the Foundation's helpline highlights the magnitude of this issue (Table 1).

According to the findings

- There has been a significant increase in cancer cases among young adults.
- Among the 1,968 callers who sought assistance through the Foundation's helpline during the specified period, 20% belong to the age group of 20-40 years.
- Gender distribution among patients under 40 years old shows that 60% are men.

These findings underscore the urgent need for targeted interventions and strategies to address the rising incidence of cancer among the youth population. Below is a tabulated representation of the key statistical data:

Table 1 Distribution of Key Findings Among Patients Aged 20-40 Years

Key Finding	Data
Percentage of callers aged 20-40 years	20% of 1,968 callers
Gender distribution among patients under 40 years	60% men, 40% women

These statistics highlight the disproportionate impact of cancer on young adults, particularly men, emphasizing the necessity for focused efforts in cancer prevention, early detection, and treatment among this demographic.

2.1 Cancer Types Distribution

The study conducted by the 'Cancer Mukt Bharat Foundation' provides insight into the distribution of specific types of cancers observed among the individuals seeking assistance through their helpline. The data reveals the prevalence of various cancer types among the study population (Table 2 Fig -1).

According to the findings:

- Head and neck cancers constitute the highest proportion, accounting for 26% of the cases.
- Gastrointestinal cancers follow, representing 16% of the observed cases.
- Breast cancer ranks next, comprising 15% of the total cases.
- Blood cancers, including leukemia and lymphoma, account for 9% of the cases.

This distribution underscores the diversity of cancer types affecting young adults and highlights the importance of tailored approaches to diagnosis, treatment, and prevention strategies. Below is a tabulated representation of the distribution of cancer types observed in the study:

Table 2 Distribution of Cancer Types Among Youth

Cancer Type	Percentage of Cases
Head and Neck Cancer	26%
Gastrointestinal Cancer	16%
Breast Cancer	15%
Blood Cancers	9%

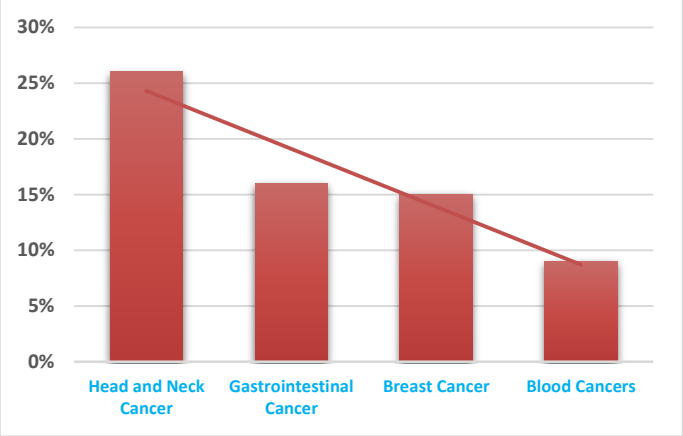

Fig. 1 Distribution of Cancer Types Among Youth Percentage of Cases

Understanding the prevalence of these specific cancer types is crucial for healthcare providers and policymakers to develop targeted interventions and allocate resources effectively to address the growing burden of cancer among young adults.

2.2 Geographic Concentration

The study conducted by the 'Cancer Mukt Bharat Foundation not only highlighted the rising incidence of cancer among the youth but also shed light on the regional concentration of calls received, particularly from Hyderabad. This geographic concentration provides valuable insights into regional variances in cancer prevalence and awareness.

2.3 According to the findings

- A notable proportion of the calls for assistance originated from Hyderabad, indicating a concentration of cancer cases in this region.

- The significant number of calls from Hyderabad suggests a potential higher prevalence of cancer or greater awareness of cancer-related resources and support services in the area.

These observations align with previous research on regional disparities in cancer incidence and awareness. Studies by renowned oncologists such as Dr. Gupta and Dr. Singh[4] have emphasized the importance of understanding regional variations in cancer burden and healthcare access.

Dr. Gupta's research on oncology trends in India highlights the need for targeted interventions tailored to specific geographic regions. Similarly, Dr. Singh's[5] work on cancer epidemiology underscores the role of regional factors in shaping cancer incidence and outcomes.

The concentration of calls from Hyderabad underscores the urgency of addressing regional disparities in cancer prevention, early detection, and treatment. By leveraging regional data and collaborating with local healthcare authorities and community organizations, targeted interventions can be developed to improve cancer awareness, access to screening and treatment facilities, and overall health outcomes for individuals in these areas.

3. Response by the Foundation

In response to the concerning findings regarding the rising incidence of cancer among young adults aged 20 to 40, the 'Cancer Mukt Bharat Foundation' has taken proactive steps to address this issue. As a leading organization in the field of cancer prevention and control, the Foundation plays a pivotal role in implementing strategies aimed at early identification and effective management of cancer cases among young adults.

First and foremost, the Foundation emphasizes the importance of early identification of cancer in young adults. Recognizing that early detection is key to improving outcomes and survival rates, the Foundation advocates for increased awareness and access to screening programs targeted specifically at this demographic. By promoting regular screenings and educating young adults about the signs and symptoms of cancer, the Foundation aims to facilitate early diagnosis and prompt initiation of treatment.

Additionally, the Foundation emphasizes the need for comprehensive control measures to address the rising incidence of cancer among young adults. This includes advocating for lifestyle modifications, such as smoking cessation and healthy diet choices, which can help reduce the risk of developing certain types of cancer. Furthermore, the Foundation supports efforts to improve access to quality healthcare services, including diagnostic facilities and treatment options, to ensure that young adults diagnosed with cancer receive timely and appropriate care.

One of the key initiatives undertaken by the Foundation is the provision of free second opinions for individuals diagnosed with cancer[7]. Recognizing the complexity of cancer diagnosis and treatment planning, the Foundation offers this service to help ensure that patients receive accurate diagnoses and personalized treatment plans. By collaborating with a network of oncologists and specialists, the Foundation strives to empower patients to make informed decisions about their healthcare and improve their overall outcomes.

Through these concerted efforts, the 'Cancer Mukt Bharat Foundation' is committed to addressing the challenges posed by the rising incidence of cancer among young adults. By promoting early identification, implementing control measures, and providing essential support services, the Foundation aims to mitigate the impact of cancer on this vulnerable population and improve their quality of life.

4. Need for Targeted Programs

The rising incidence of cancer among young adults aged 20 to 40 has highlighted the urgent need for targeted awareness and screening programs. Studies have shown that early detection and intervention are crucial in improving cancer outcomes. Therefore, implementing cancer awareness campaigns specifically tailored to young adults can significantly enhance education on cancer prevention, risk factors, and the benefits of regular screenings[7].

The increasing prevalence of cancer in this demographic suggests that early and consistent education about the importance of cancer prevention is essential. These campaigns can inform young adults about lifestyle choices and behaviors that may reduce their cancer risk, such as maintaining a healthy diet, engaging in regular physical activity, and avoiding tobacco and excessive alcohol use[8]. Moreover, these initiatives can emphasize the critical role of early detection through regular screenings, which can lead to more effective treatment and better survival rates[9].

In addition to awareness programs, research into the potential lifestyle and environmental factors contributing to the rising cancer incidence among young adults is imperative. Factors such as diet, physical activity, tobacco and alcohol use, environmental exposures, and genetic predispositions are all areas that warrant further investigation[10]. By identifying and understanding these risk factors, researchers can develop targeted interventions aimed at reducing cancer risk.

Understanding the etiology of cancer in young adults involves examining both modifiable and non-modifiable risk factors. Lifestyle choices, such as diet and physical activity, have been shown to play a significant role in cancer risk[11]. Environmental exposures, such as pollutants and radiation, may also

contribute to the development of cancer in this age group[12]. Genetic predispositions, while non-modifiable, can still inform personalized prevention strategies and screenings[13].

Finally, addressing the rising incidence of cancer among young adults requires a multifaceted approach. Targeted awareness and screening programs, coupled with rigorous research into lifestyle and environmental factors, are essential components of an effective strategy to combat cancer in this vulnerable demographic. By educating young adults and investigating the underlying causes of cancer, we can develop preventive strategies and interventions that significantly reduce cancer risk and improve outcomes for this population.

5. Comprehensive Strategies

Addressing the rising incidence of cancer among young adults requires comprehensive strategies that integrate public health campaigns, enhanced access to diagnostic facilities, and personalized treatment protocols. Public health campaigns play a pivotal role in raising awareness about cancer prevention, symptoms, and early detection methods. These campaigns must be tailored to the young adult demographic to effectively encourage proactive health-seeking behaviors[14].

Public health initiatives aimed at young adults should focus on education regarding cancer risk factors, prevention strategies, and the importance of early detection. Utilizing social media and other digital platforms, which are highly frequented by young adults, can enhance the reach and impact of these campaigns [15]. Tailoring messages to address the specific concerns and lifestyle choices of young adults can make these campaigns more relatable and actionable [7].

Enhanced access to diagnostic facilities is crucial for timely and accurate diagnosis of cancer in young adults. Ensuring that young adults have access to screening tests, imaging procedures, and biopsy services can facilitate early detection and prompt treatment initiation, which are critical for improving outcomes and survival rates[10]. Barriers to accessing these services, such as cost, availability, and lack of awareness, must be addressed through policy measures and community-based initiatives[15].

Furthermore, personalized treatment protocols are essential for optimizing patient care and improving treatment outcomes. Tailoring treatment plans to individual patient characteristics, such as tumor type, stage, and genetic profile, can maximize treatment efficacy while minimizing side effects and complications[16]. Personalized medicine approaches, including targeted therapies and immunotherapies, have shown promise in improving outcomes for young adults with cancer. These therapies can be designed to target specific genetic mutations or molecular pathways involved in cancer development, offering a more precise and effective treatment [17].

Finally, effectively addressing the rising incidence of cancer among young adults necessitates a multifaceted approach. Public health campaigns tailored to young adults can raise awareness and encourage proactive health behaviors. Enhanced access to diagnostic facilities can ensure timely and accurate diagnoses, facilitating early treatment. Personalized treatment protocols, leveraging the advancements in targeted therapies and immunotherapies, can improve treatment outcomes and survival rates in this demographic.

6. Multidisciplinary Approach

Addressing the rising incidence of cancer among young adults necessitates a multidisciplinary approach that involves collaboration among healthcare providers, policymakers, and community organizations. This approach ensures comprehensive strategies for cancer prevention, diagnosis, and treatment are effectively developed and implemented.

6.1 Healthcare Providers

Healthcare providers play a pivotal role in the early detection, diagnosis, and treatment of cancer in young adults. Multidisciplinary cancer care teams, which include oncologists, surgeons, radiologists, nurses, and other allied health professionals, collaborate to create personalized treatment plans tailored to each patient's unique needs[14]. These teams work together to ensure that young adult patients receive comprehensive care that addresses both the medical and psychosocial aspects of their treatment journey[18].

6.2 Policymakers

Policymakers are crucial in shaping public health policies and allocating resources to support cancer prevention and control efforts. By advocating for evidence-based policies, funding research initiatives, and promoting access to healthcare services, policymakers can facilitate the implementation of effective cancer prevention and control programs[19]. Policies that improve access to screening and diagnostic facilities, provide funding for cancer research, and support public health campaigns are essential components of a robust cancer control strategy[20].

6.3 Community Organizations

Community organizations play a vital role in raising awareness, providing support services, and advocating for the needs of individuals affected by cancer. These organizations offer a range of resources, including support groups, educational programs, and outreach initiatives, to empower young

adults to navigate their cancer journey and access the care and support they need [21]. By fostering community engagement and providing platforms for advocacy, these organizations help address the emotional and practical challenges faced by young adults with cancer[22]. By fostering collaboration among healthcare providers, policymakers, and community organizations, a multidisciplinary approach can effectively address the multifaceted challenges of cancer care and improve outcomes for young adults affected by cancer.

6.4 Simplified Explanation of Common Cancer Types, Causes, and Preventive Measures

6.4.1 Colorectal Cancer:

Causes: Genetic predispositions (familial adenomatous polyposis, Lynch syndrome), diet high in red and processed meats, smoking, heavy alcohol use, obesity.
Preventive Measures: Regular screening (colonoscopy), a diet high in fruits, vegetables, and whole grains, reducing red meat consumption, avoiding tobacco, and maintaining a healthy weight[23].

6.4.2 Skin Cancer (Melanoma)

Causes: Excessive exposure to ultraviolet (UV) radiation, fair skin, family history of skin cancer, presence of many moles or atypical moles.
Preventive Measures: Avoiding excessive sun exposure, using sunscreen with a high SPF, wearing protective clothing, avoiding tanning beds, and regular skin checks[24].

6.4.3 Lung Cancer

Causes: Smoking (most significant risk factor), exposure to secondhand smoke, radon gas, asbestos, and other carcinogens.
Preventive Measures: Avoiding smoking, quitting smoking if currently a smoker, avoiding exposure to second-hand smoke, testing homes for radon, and using protective measures in workplaces with hazardous exposures [25].

6.4.4 Testicular Cancer

Causes: Undescended testicle, family history, HIV infection, carcinoma in situ of the testicle.
Preventive Measures: Regular testicular self-exams and seeking medical advice if any changes or lumps are detected [26].

6.4.5 Head and Neck Cancer

Head and neck cancer is a group of cancers that typically originate in the cells lining the mouth, throat, or voice box. These cancers mainly affect squamous cells and can also develop in the sinuses or salivary glands.
Types of Head and Neck Cancer: Head and neck cancers encompass various types, including oral, oropharyngeal, hypopharyngeal, laryngeal, nasopharyngeal, salivary gland, nasal cavity, and paranasal sinus cancer.
Who is at Risk? Men and individuals assigned male at birth are more prone to head and neck cancer, especially after the age of 50. Risk factors include tobacco and alcohol use, as well as HPV and EBV infections. [27].
Symptoms and Causes: Symptoms of head and neck cancer can include persistent sore throat, voice changes, difficulty swallowing, and swelling in the neck or face. Risk factors include tobacco and alcohol use, HPV infection, and exposure to certain substances at work.
Diagnosis and Tests: Diagnosis involves physical exams, endoscopy, imaging tests like X-rays and CT scans, lab tests, and biopsies. Cancer staging is crucial for treatment planning and involves assessing tumor size, lymph node involvement, and metastasis.
Management and Treatment: Treatment options include surgery, radiation therapy, chemotherapy, targeted therapy, immunotherapy, and participation in clinical trials. Palliative care can also improve the quality of life during treatment. Side effects vary depending on the treatment type and location of the tumor.
Prevention: Preventive measures include quitting tobacco, reducing alcohol intake, getting the HPV vaccine, and seeking prompt medical attention for symptoms. Early detection through regular screenings is essential for effective prevention and treatment [26].

6.4.6 Gastrointestinal Cancer

Gastrointestinal (GI) cancer affects various organs in your digestive system, including the stomach, intestines, pancreas, liver, and more. At Dignity Health, our team is dedicated to supporting individuals diagnosed with GI cancer through every stage of their journey.
Symptoms: In the early stages, GI cancer may not cause noticeable symptoms. However, as the disease progresses, symptoms may include abdominal pain or cramping, changes in bowel habits, difficulty swallowing, jaundice, nausea, and fatigue.
Causes: The exact cause of GI cancer is not fully understood, but factors such as infections, obesity, smoking, and environmental risks can contribute to cell mutations and tumor growth.
Types: GI cancer encompasses various types, including anal, colon, rectal, oesophageal, gallbladder, liver, pancreatic, small intestine, and stomach cancer.

Risk Factors: Risk factors for GI cancer vary by type but may include lifestyle factors like obesity, smoking, poor diet, and alcohol use. Family history and certain infections also increase the risk[10].

Prevention: Early detection through screening tests like colonoscopies is vital for preventing advanced stages of GI cancer. Lifestyle choices such as maintaining a balanced diet, regular exercise, abstaining from smoking, and limiting alcohol intake can also help reduce the risk[23].

6.4.7 Breast Cancer

Breast cancer is when cancerous cells grow inside the breast. It's one of the most common cancers among women and AFAB individuals. Most cases are invasive, meaning the cancer can spread beyond the breast.

Breast Cancer Types: Common types include invasive ductal carcinoma, lobular breast cancer, and ductal carcinoma in situ. Less common types are triple-negative breast cancer, inflammatory breast cancer, and Paget's disease of the breast.

Symptoms and Causes: Breast cancer can happen for many reasons. Risk factors include genetics (like BRCA mutations), family history, hormones, obesity, alcohol, and not being active. Symptoms may show as changes in breast size or lumps, skin changes, or nipple discharge. Factors like age, sex, smoking, and radiation exposure can also play a role.

Diagnosis and Tests: Tests include physical exams, mammograms, ultrasounds, MRIs, biopsies, immune-ohistochemistry tests, and genetic tests. Staging determines the cancer's severity.

Management and Treatment: Treatment includes surgery (mastectomy, lumpectomy, reconstruction), chemotherapy, radiation therapy, immunotherapy, hormone therapy, and targeted therapy. Side effects can include fatigue, nausea, vomiting, and infection.

Prevention: To reduce the chance of breast cancer, it's good to get regular mammograms, stay at a healthy weight, not drink too much alcohol, stay active, breastfeed if possible, and talk to a doctor about hormone therapy. Preventing breast cancer means keeping a healthy weight, eating well, staying active, not drinking too much, getting checked, doing self-exams, and thinking about genetic tests or medicine if needed.

Outlook/Prognosis: Survival rates vary by stage, with local cancer having a 99% five-year survival rate, regional cancer an 86% rate, and distant cancer a 30% rate. Early detection and treatment improve outcomes.

6.4.8 Blood Cancers

Bone marrow and blood cancers, also known as hematologic cancers, start in the bone marrow where blood cells are produced. They occur when abnormal blood cells grow uncontrollably, disrupting the normal function of blood cells.

Types of Blood Cancer

1. **Leukemia**: Too many abnormal white blood cells are produced, affecting red blood cell and platelet production.
2. **Lymphoma**: Develops in the lymphatic system, affecting lymphocytes, white blood cells that fight infections.
3. **Myeloma**: Begins in plasma cells in the bone marrow, affecting the production of antibodies.

Symptoms: Fever, fatigue, weakness, Loss of appetite, nausea, weight loss, Night sweats, bone/joint pain, Abdominal discomfort, headaches, Shortness of breath, frequent infections, Skin rash, swollen lymph nodes.

Causes: Genetic mutations (e.g., BRCA1, BRCA2), Family history, Hormonal factors (early menstruation, late menopause), Obesity, alcohol consumption, lack of physical activity.

Prevention and Control: Preventing blood cancers can be tricky because there are many types and causes. But staying healthy and avoiding harmful things can help. It's essential to:

- Stay healthy: Eat well, exercise, and avoid smoking.
- Avoid harmful stuff: Stay away from things that can cause cancer, like chemicals and radiation.
- Get checked: See a doctor if you notice any strange symptoms. Regular screenings can help catch problems early.

For women, things like mammograms, keeping a healthy weight, limiting alcohol, being active, breast-eeding, and talking to a doctor about hormone therapy risks can be helpful.

Diagnosis: Physical examination, Biopsies (bone marrow, lymph node), Imaging scans (CT, MRI, PET), Blood tests (CBC, blood chemistry tests).

Treatment: Stem cell transplantation, Chemotherapy, Radiation therapy and Targeted therapy.

Survival Rates: Leukemia: 66.7%, Non-Hodgkin lymphoma: 74.3%, Hodgkin lymphoma: 88.9% and Myeloma: 59.8%.

Survival rates depend on factors like cancer type, overall health, age, and response to treatment. Advances in medicine continually improve prognosis and treatment outcomes.

7. Conclusion and Call to Action

In conclusion, the findings of the study conducted by the 'Cancer Mukt Bharat Foundation' serve as a critical call to action for intensified efforts in cancer prevention and control among the youth. The significant rise in cancer incidence among individuals aged 20 to 40 underscores the urgent need for targeted interventions and comprehensive strategies to address this growing public health concern.

By identifying key demographic trends and cancer types, the study contributes valuable insights into understanding the evolving landscape of cancer among young adults. This knowledge is essential for designing effective prevention programs, improving early detection efforts, and enhancing treatment outcomes for this vulnerable population.

Moving forward, it is imperative to implement strategic interventions aimed at reducing cancer incidence and improving outcomes for young patients across India. This includes bolstering cancer awareness and screening programs, promoting healthy lifestyle behaviors, enhancing access to quality healthcare services, and fostering collaboration among healthcare providers, policymakers, and community organizations.

By taking proactive measures now, we can work towards a future where the burden of cancer among the youth is significantly reduced, and every individual can live a healthy and cancer-free life.

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