Geriatric assessment and targeted therapies in cancer

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Abstract
The aging process is inevitable. The body changes in a number of ways as we age. Cancer affects over 65% of the elderly population. The survey indicates that the incidence of cancer rises exponentially with age. At the moment, older adults account for 70% of cancer-related fatalities and 60% of newly diagnosed cases. A number of malignancies, including those of the breast, colon, prostate, pancreas, lung, bladder, and stomach, become more noticeable as people age. Secondary alterations are occurring in older people along with the physiological changes. A unique approach is therefore crucial for cancer diagnosis, treatment, and survival since it considers the rising risk of cancer as well as secondary illnesses and quality of life.

Keywords: Cancer, aging, diagnosis, ailments, breast cancer, pancreatic cancer, stomach cancer

1. Introduction
One of the most deadly illnesses that commonly strike the elderly due to aging is cancer. Over 65 percent of the elderly population has cancer (1,2). The body's cellular DNA sequence is altered by prolonged exposure to UV radiation, poor food, alcoholism, smoking, obesity, or hazardous chemical exposure, all of which can result in cancer. Due to physiological changes in the body, treating cancer in older people presents more obstacles than in younger ones. In these situations, physicians and the patient's family must make a difficult decision about the best course of therapy. To increase tumour control, quality of life, and survival, treatment planning and optimization are therefore necessary. Identification of aging-related vulnerabilities is made possible by geriatric assessments, a multifaceted assessment of older people's functional, physiological, medical, and nutritional condition (3). Primary care is just as crucial to providing older people with high-quality care as geriatric assessment (4). This article aims to raise awareness of geriatric cancer assessments and treatment (5).

2. Geriatric assessment (GA)
The goal of geriatric assessment is to evaluate older cancer patients' general health and well-being using a variety of examinations and questionnaires (6). In this GA, several health domains are being assessed. Such as one's physical condition, functional status, health issues, use of prescription drugs on a daily basis, mental health, physiological state, nutritional status, and social support. According to research, GA helps reduce the side effects of chemotherapy by providing information about cancer patients. This aids in making sure that the patient's plans reflect their principles and

aims. Because geriatric impairments are significant for prognosis and treatment difficulties, conducting GA before treatment decisions enables for upfront customization of treatment to avoid changing the course of care after issues demonstrate the patient's inability to tolerate conventional care. Growing research in recent years has demonstrated that GA & management can enhance treatment outcomes, resulting in decreased rates of post-operative complications and toxicity from chemotherapy. While older patients who are frailer than their fit counterparts are more likely to experience complications from surgical procedures, it is crucial to carefully select patients before beginning any procedure (7).

3.Treatment

3.1. Targeted therapies: Precision in cancer treatment

Cancer cells differ from normal cells due to genetic alterations. The DNA of a cell contains genes, which instruct the cell on what to do. Certain gene mutations cause a cell to behave differently from what a typical cell would. For instance, cancer cells may have altered genes that enable rapid cell growth and division and these kinds of alterations turn a cell into cancer (8). Drugs known as targeted cancer therapies specifically target the proteins or genes in cancer cells that aid in the growth and metastasis of the disease. They might also target different kinds of cells that aid in the growth and spread of cancers. Two essential components of personalized therapy are choosing the right course of action based on unique features of the tumour that will serve as therapeutic targets, and considering the patient's clinical state to guarantee that the target agent is suitable in terms of delivery mode and possible adverse events. Chemotherapy Risk Assessment Scale for High-Age Patients and Cancer and Aging Research Group scores are two prediction tools for chemotherapy toxicity in older cancer patients that have been developed to support treatment choices. This therapy Stop or block the chemical signals that a cancer cell needs to proliferate and divide or modify the cancer cells' proteins to cause them to die, and cease producing new blood vessels to nourish the cancer cells. This enhances the body's natural defences to destroy the cancer cells. Guidelines were developed so that medical professionals could modify the suggested targeted therapy based on the older patient's geriatric and cancerous profiles (9).

3.1.1.Types of targeted therapy

Targeted therapies come in a wide variety and can be used to treat a wide range of cancer types. These are some types along with a few usage examples.

- **Angiogenesis inhibitors:** These prevent new blood vessels from growing, which feeds and nourishes cancer cells. Bevacizumab is one example (many different cancers).
- **Monoclonal antibodies:** These have the ability to deliver drugs or other molecules into or onto cancer cells in order to kill the cancer cell. Examples include cetuximab (certain colorectal, lung, head, and neck cancers), alemtuzumab (certain chronic leukaemias), and trastuzumab (certain breast cancers). Because certain monoclonal antibodies seek out, attach to, and destroy a specific target on a cancer cell, they are also known as targeted therapies. However, other monoclonal antibodies function similarly to immunotherapy by improving immune system response, which enables the body to more efficiently locate and target cancer cells. A monoclonal antibody called bevacizumab (Avastin) functions by obstructing the blood vessels that supply tumours. When monoclonal antibodies bind to their target growth factor receptors and change their activation state or prevent ligand binding, pro-tumour growth and survival signalling is disrupted (10). Cancer cells coated with monoclonal antibodies are easily identifiable and can be targeted for elimination. By inducing an immune response, it has the ability to destroy the outer membrane of cancer ·cells. It also stops the spread of cancerous cells. A cancer cell's ability to interact with proteins that promote cell division a process vital to the cancer's growth and survival is impeded by specific monoclonal antibodies (11).

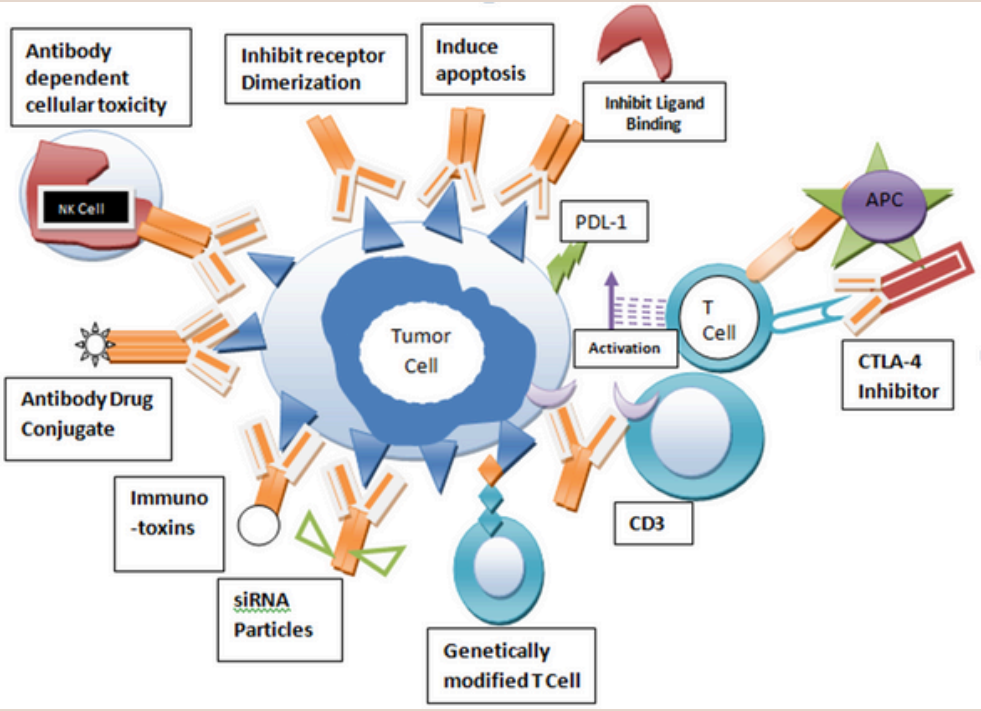

Figure 1. Mechanism of action of monoclonal antibody (mAb): Act through Antibody dependent cellular toxicity. Conjugated mAb including antibody drug conjugate, immunotoxins, siRNA particles. Mechanism through genetically modified T cell and act through CD3 cells.

Cancer patients are now receiving treatment with immunotherapeutic medications and target therapies, which has revolutionized the field (12). Particularly when taking into account the ideal ratio of toxicity to efficacy, they constitute a compelling option in the toolbox of oncologists. The antibody-drug conjugates guarantee the ideal combination. Immuno- and target-therapies have been combined with the goal of increasing efficacy. With a low incidence of side effects and a limited "off-target" effect, they enable the delivery of large doses of medication to the target. Although there is insufficient data to support the use of immunoconjugates in this population, these factors could make them an appealing first option, for particularly fragile elderly patients.

- **Proteasome inhibitors**: They cause abnormal cell activity, which kills cancer cells. Bortezomib, for instance (multiple myeloma) signal transduction inhibitors. These tamper with cell signals to modify the way cancer cells behave. Imatinib is one example (certain chronic leukaemia).
- **Signal transduction inhibitors**: Signal transduction inhibitors inhibit the signal transduction mechanism through which other proteins in the cell are unable to receive the signal and hence further process of dividing and multiplying of the cell is ultimately inhibited. Targeted therapies are useful in treating various cancers like breast cancers, blood cancers, brain cancers, skin cancers, thyroid cancers, stomach cancers.

3.2. Cancer rehabilitation

With geriatric assessment is used to thoroughly evaluate physical functions, psycho-physiological/social/environmental situations, and comorbidity in the treatment of elderly cancer patients, supportive care systems are also necessary. Cancer rehabilitation is crucial to this process because it helps with functional recovery, preventing complications, and maintaining and improving ADLs and physical functions up until the point when palliative care is required (13). Growing dysfunction, secondary impairment, and prognosis, in addition to the primary disease's progression, must be taken into account for cancer patients undergoing rehabilitation. Therapy is frequently given in conjunction with rehabilitation regardless of whether the patient is hospitalized or receiving outpatient care; however, treatment side effects may interfere with rehabilitation depending on the patient's disease stage. For this reason, regular conferences and cancer boards are required to facilitate close communication between the attending physician, ward and outpatient staff, and rehabilitation staff.

4. Conclusion

Treatment choices for elderly cancer patients can be challenging as each patient has unique goals, preferences, concerns, resources, and vulnerabilities, thus risks and benefits must be carefully considered. Through better treatment planning based on the patient's health state and the optimization or provision of support for difficulties and impairments detected through GA, leading to enhanced results in a range of contexts. The challenges currently focus on using GA and management in routine cancer practice, as its many benefits have become more apparent. In a multi-professional order, oncologists, geriatricians, and allied health professionals such as nurses and supportive care specialists should be included in the design of this new structure. In a co-design approach, patients should be consulted and their aims and preferences should be included for joint decision-making. Many targeted therapies are also involved for treatment but in older patients, optimization as well as adaptation to stress in the therapy is very important.

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