

CANCER PREVENTION IN THE OLDER INDIVIDUAL

LODOVICO BALDUCCI

OBJECTIVES: *To examine the current information about primary and secondary cancer prevention measures in older individuals.*

DATA SOURCES: *Literature review of evidence-based resources on aging and cancer prevention.*

CONCLUSION: *Aging is a risk factor for the development of malignancy. Older tissues are particularly prone to the action of environmental carcinogens; primary prevention of cancer through the adoption of healthy lifestyles and the appropriate implementation of secondary cancer prevention measures could potentially reduce the morbidity and mortality associated with malignancy.*

IMPLICATIONS FOR NURSING PRACTICE: *Geriatric evaluation can identify patients that will benefit from cancer prevention. Patients and families need education and support so they can make good decisions about when to implement primary and secondary cancer prevention measures.*

KEY WORDS: *elderly, aging, primary cancer prevention, secondary cancer prevention, geriatric evaluation.*

It is easy to overlook the value of cancer prevention activities in older individuals. This issue is very timely because the population is aging worldwide; the prevalence, incidence, complications and mortality of cancer

increase with age;¹ cancer prevention may counteract this trend.

Cancer prevention comprises primary and secondary prevention. Primary prevention includes the removal of environmental carcinogens (such as tobacco use) and conditions that favor the development of cancer (such as obesity). Chemoprevention is a specific form of primary cancer prevention that encompasses the utilization of agents that oppose carcinogenesis or cancer growth. Secondary prevention focuses on the early diagnosis of cancer when malignancy may still be curable or managed with less toxic therapy through the screening of asymptomatic individuals at risk. Older adults can benefit from both primary and secondary cancer prevention. Following a brief review of biological and clinical aspects of aging, this article will examine the

Lodovico Balducci, MD: *Senior member Moffitt Cancer Center, Professor of Oncologic Sciences and Medicine, University of South Florida College of Medicine, Tampa, FL.*

Oncologic Sciences and Medicine, Moffitt Cancer Center, University of South Florida College of Medicine, 12902 Magnolia Dr., Tampa, FL 33612. e-mail: Lodovico.balducci@moffitt.org

© 2016 Elsevier Inc. All rights reserved.
0749-2081

<http://dx.doi.org/10.1016/j.soncn.2016.05.011>

current information about cancer prevention in older individuals.

BIOLGIC INTERACTIONS OF AGING AND CANCER

The association of aging and cancer may be caused by a number of factors.^{2,3} The development of cancer is a time-consuming process that is gradually completed; the longer an individual lives, especially if they do not succumb to another disease, the greater the chance of completion of carcinogenesis. Further, as individuals age there is an increased susceptibility of aging tissues to environmental carcinogens.^{4,5}

Increased Susceptibility of Aging Tissues to Environmental Carcinogens

It is well known that the application of the same dose of carcinogens to the skin of experimental rodents leads to higher number of cancers in older than in younger animals.³ The tissues of older animals are primed to the action of these substances because they are in a condition of advanced carcinogenesis because of genomic and epigenetic alterations. Genomic alterations are mainly caused by formation of free radicals and include DNA adducts, translocation, and point mutations. Normally, the cell is equipped with so called gate keeper and care taker (housekeeper) genes. The first arrest the proliferation of the damaged cells and allow the second ones to repair the damage or to eliminate the cells if the damage cannot be repaired (Fig. 1).⁶ These protective mechanisms may fail with age because of overwhelming genomic damage or malfunction of gate keepers or care taker genes. Epigenetic alterations include activation of oncogenes through hypomethylation and inactivation of the anti-proliferative ones through hypermethylation.⁷

Changes in the Body Environment That May Favor Cancer Development

Aging can lead to chronic and progressive inflammation, as well as proliferative, endocrine and immune senescence. Inflammation is a hallmark of aging and may facilitate the growth of cancer.⁸ It may also lead to the generation of tissue carcinogens. Aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs) may prevent cancer by ameliorating inflammation, which is why these agents are sometimes utilized as chemoprevention agents. Proliferative arrest of the stromal cells in-

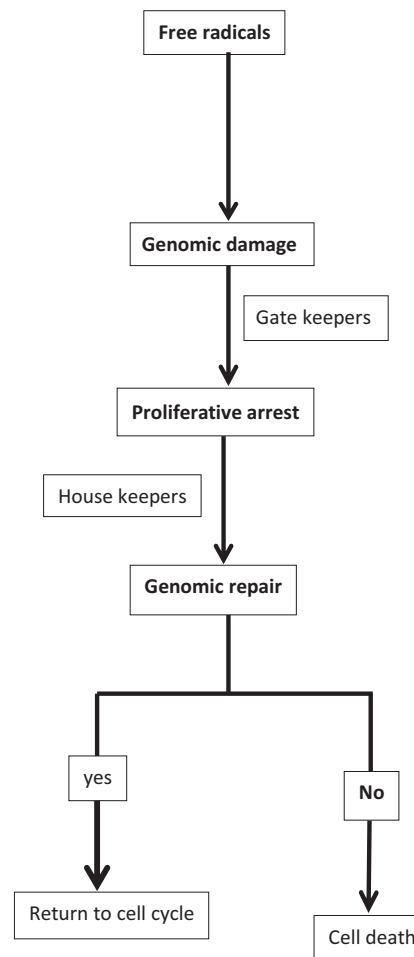


FIGURE 1. Model of carcinogenesis and DNA repair in a healthy adult. This figure depicts the normal process of carcinogenesis and repair. In an older adult there may be more genomic damage because of repeated exposure to free radicals and gate keeper and care taker (housekeeping) genes may not work as efficiently or effectively, leading to the development of malignancy.

volves that appearance of the Senescence Associated Secretory Phenotype (SASP) that leads to secretion of tumor growth factors and inflammatory cytokines.⁹ Inflammation stimulates tumor growth and SASP favors metastases.

Endocrine senescence involves increased resistance to insulin and increased circulating levels of this hormone, as well as of Insulin-like growth factor 1.¹⁰ These substances provide powerful stimulation of tumor growth. Interestingly, metformin (which ameliorates insulin resistance) has been shown to delay the development of breast cancer in mice and is associated with a more prolonged survival of women with metastatic breast cancer.¹¹

Download English Version:

<https://daneshyari.com/en/article/2676128>

Download Persian Version:

<https://daneshyari.com/article/2676128>

[Daneshyari.com](https://daneshyari.com)