Chapter 12
Ageing and Cancer:
The Epigenetic Basis, Alternative Treatment, and Care

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ABSTRACT
This chapter describes how cancer is the disorder of immune system and is epigenetically controlled. As a person grows older the cells in their body become weaker. The defense system of the body and genetic repair mechanisms becomes more delicate. Loss of control in these protective mechanism leads to cancer. Thus, cancer and ageing are entwined in an intricate and abstruse relationship. This chapter explores the demographic changes, biological theories and clinical considerations that link cancer and ageing. It highlights the implications of these associations in the context of population and health system, with a focus on preventative strategies, research imperatives and delivery of cancer services. Furthermore, the chapter discusses how to best prepare the most junior of the medical profession to manage a growing number of senior cancer patients. Overall, it underscores how all elements in the relationship of cancer and ageing need to be considered and incorporated into a framework that facilitates a holistic approach to cancer control.

DOI: 10.4018/978-1-5225-3480-8.ch012
INTRODUCTION

Any understanding of human illness or wellness has to be in totality and not in bits and pieces, because human body does not work in bits and pieces but functions as a whole. (Hedge, 2014)

Physiological ageing implies a gradual loss of cellular and body vitality associated with atrophy of tissues or organs. This process is aggravated or mimicked by the degenerative diseases of the old age so that the physiological and pathological states tend to merge. Healthcare personnel should attempt to identify the distinctions between ageing and disease. In old age multiple disease often coexist and interact with one another and drug induced disorders are also common in this age groups (Cotran & Robbins,1997). Cancer is considered as genetic disorder expressed at cellular level, totally controlled by environment. Genetic Control System is the most intricate one. It operates in each and every cell in the body for controlling intracellular and extracellular functions. As a person grows older the cells in their body becomes weaker. The defence system of the body and genetic repair mechanisms becomes more delicate. Loss of control in these protective mechanism leads to cancer. Thus, cancer and ageing are entwined in an intricate and abstruse relationship. Epidemiological data demonstrate that both cancer incidence and mortality increase exponentially with age and thus age is regarded as a prime risk factor for cancer (Cassel, Leipzig, Cohen, & Larson, 2003). It is the connection between death and disease that makes cancer much more frightening. However, the biological mechanisms that underpin this correlation are still being uncovered. Additionally, the unique aspects of cancer management in an elderly cohort, relating to decision making, co-morbidities, prevention, diagnosis, treatment and clinical trial representation, continue to be recognised at the interface of geriatrics and oncology. For understanding how ageing is related with cancer it is crucial that one must understand how human system actually works. The reductionist science of the human body that are taught through mainstream medical education system is totally wrong. Human body and its functions are holistic phenomena.

Human body is a complex combination of various extremely specialized systems. All these specialized system functions in two major ways. First each and every system performs their functions at individual level and second, they work together with other systems of the body thus making the life possible. The ultimate goal of these specialized systems is to maintain the Homeostasis of the body. As it is known that Homeostasis is the maintenance of nearly constant condition in the internal environment of the body. Disturbance of any form caused to the homeostasis of the body leads to disease. Thus, a disease can be interpreted as the dynamic destruction of the homeostasis of the body. There are several complex biochemical reactions working together as a chain system in the body for maintaining the constant condition of the internal environment. One component from a biochemical pathway is related to some other biochemical pathway and so on. So, fault in a single component of a biochemical pathway may lead to the collapse of the entire system. There are various control systems in our body that are the contributing factor(s) in the maintenance of homeostasis (Goswami, 2017).

This chapter explores the demographic changes, biological theories and clinical considerations that link cancer and ageing. It highlights the implications of these associations in the context of population and health system, with a focus on preventative strategies, research imperatives and delivery of cancer services. Furthermore, the chapter discusses how to best prepare the most junior of the medical profes-