

Why Cancer Occurs

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1. Introduction

Written by Theresia Indah Budhy¹, cancer is a term for malignant tumors, until now the incidence of cancer is still very high and the problem has not been solved properly. This is because the occurrence of a cancer is very complex and the factors involved in it are also heterogeneous so this case is still quite high. Some factors related to cancer can originate from humans itself (host) endogenous or factors from outside/exogenous. Endogenous factors can be in the form of regulatory genes/cell regulators, hormones, immune and psychic systems, also hereditary. While exogenous factors are more complex because there are so many, among others biological factors can be bacteria, viruses, fungi; chemical factors can come from food, drinks, cosmetics, cleaning materials, air, environmental sanitation; whereas physical factors such as electronics, radiation; although radiation is also divided into several types, for example solar radiation and X-rays. After reading this book hopefully adds more insight about cancer. Remembering the incident of a cancer is very complex, the discussion of the cancer problem still needs to be added.

In this book only briefly discuss things related to cancer, starting from the definition of cancer, the classification of the names of each cancer type, the different clinical manifestations of each type of cancer and some of the factors that cause its occurrence as well as the pathobiology of cancer. In giving a name to cancer based on the cell of origin or cancer parenchyma for example, in cancer that occurs in epithelial cells, the word Carcinoma will be added to its name, if it originates from mesenchymal cells, it will be added Sarcoma. The description of the clinical manifestations of a cancer varies from both types of carcinoma and sarcoma. In the type of cancer, carcinoma

usually presents as an ulcer or a nodule exophytic resembles a cauliflower, while the sarcoma type has a shape like a lump or liquid when it occurs in the blood. The occurrence of a cancer when reviewed from the causative factor sometimes also gives a different form and location, as an example of a factor the cause of the sun's rays are many attacks in the epidermal or skin area, the type that occurs because the most exposure to sunlight is Basal cell carcinoma. While other cases are caused by a virus usually gives a picture like the condition of a network infected by a virus, in the form of a nodule and ulcer and its various types can be a carcinoma or sarcoma. Examples caused by viral infections are nasopharyngeal carcinoma, lymphoma maligna where the main causative factor is Epstein Barr virus. In other types caused by viruses such as Kaposi's sarcoma, where many are associated with HIV virus infection in AIDS patients. When the occurrence of a cancer is reviewed from its pathobiology then many are involved in it, especially regulatory genes on cell growth. There is a concept that the pathobiology of cancer is influenced by four main things, namely the proliferation regulator gene (oncogene) as an example that has been mentioned in the previous chapter is *ras*; *c-myc*; apoptosis regulator genes (gene suppressors) such as the *p53* gene; genes regulating the repair of damaged cells and the immune system. Currently other related concepts are also developing with cancer progression, namely angiogenesis, because factors in the formation of new blood vessels have a very important role in the ability to survive and the development and spread of a cancer. As it is known that blood vessels can provide nutrition and oxygenation in the cells, so that the cancer cells become stronger and live in addition to the blood flow throughout the body allowing cancer cells to move to a place further away from the primary cancer. Considering that a lot of research has been done related to angiogenesis in cancer.

To determine the stage of cancer can also be performed through the clinical stage with the concept of T (tumor cross-section), N (nodule, lymphnode involved) and M (metastasis). Besides based on that, the most important thing in determining the diagnosis is histopathological examination or examination with microscope. Through histopathological examination is the Gold Standard for the diagnosis of a cancer, it can be known the type of cancer and the stage of cancer cells differentiation, so that it can correctly determine the therapy plan and know the prognosis (estimated cure) of a cancer. Histopathology inspection becomes very important for the final diagnosis of a cancer because from the results of the examination many things will be obtained such as the type of cancer cells, the shape of cancer cells, even the genetic markers of a cancer. In conclusion after reading this book hopefully adds more insight about cancer. Remembering the incident of a cancer is very complex, the discussion of the cancer problem still needs to be added. In this book only briefly discuss things related to cancer, starting from the definition of cancer, the classification of the names of each cancer type, the different clinical manifestations of each type of cancer and some of the factors that cause its occurrence as well as the pathobiology of cancer.

2. Reference

1. Theresia Indah Budhy. Mengapa Terjadi Kanker. Surabaya: Airlangga University Press, 2019.