Free research paper on genetic disposition to breast cancer

Science, Genetics

Persons with genetic disposition to cancer are likely to have mutations in BRCA1 or BRCA2 genes that are likely to greatly increase the risk of such persons developing ovarian and/or ovarian cancer. In a normal person, the BRCA1 gene facilitates the making of a protein that is responsible to the suppression of tumor. The tumor suppressor proteins assist in preventing cells from increasing and dividing too quickly. Within the nucleus of normal cells, the BRCA1 gene interacts with other proteins to repair breaks in the DNA. The breaks in the DNA are usually caused by medical and natural radiations as well as other environmental exposures (National Cancer Institute, 2015). The breaks may also take place when chromosomes exchange genetic material as they prepare for cell division. As such, by helping in the restoration of DNA, the BRCA1 protein plays an important role in ensuring the stability of genetic information is maintained in cells. It is important to note that the BRCA1 protein further regulates the activities of other genes thereby playing a crucial role in the development of embryos. In order to perform its functions effectively, the BRCA1 has to interact with other proteins and other tumor suppressors that control the division of cells. Various researches show that more than 1, 800 mutations take place in the BRCA1 gene. Researchers associate most of such mutations to increased likelihood of developing breast cancer in women and in men. These mutations occur in all body cells and can pass from one generation to another, but not every person who becomes heir to a mutation in the BRCA1 gene develops cancer. Majority of the BRCA1 gene mutations initiate the production of unusually short version of the BRCA1 protein and may also prevent the production of proteins from one type of the gene. As a

consequence, there is less proteins BRCA1 protein to repair the damaged DNA or control mutations occurring in the other genes. The defect accumulates and can cause increased production and uncontrollable division that eventually forms a tumor.

The BRCA1 gene interacts with other genes as well as environmental factors to develop cancer. Accordingly, most studies demonstrate that the key determinants of cancer are related to lifestyle and that only a small portion of inherited BRCA1 gene is the solely responsible for cancer (WHO, 2015). Such understanding continues to influence medical concepts and techniques that inform the foundation of the diagnosis and treatment of the disease. The genetic testing currently available is the hereditary breast cancer syndrome that examines the BRCA1 genes.

References

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