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Lymphocytes CD8+ Expression Mean Increases the Immunity against Cancer

Adi Prayitno[1], Anita Sari[1], Laila Wahyuningsih[1], Meutia Srikandi Fitria[2], Okid Parama Astirin[2], Ambar Mudigdo[1], Suhartono Taat Putra[3]

[1]Department of Pathobiology, Faculty of Medicine, University of Sebelas Maret, Surakarta, Indonesia
[2]Department of Biology, Faculty of Mathematic and Natural Science, Sebelas Maret University, Surakarta, Indonesia
[3]Department of Pathobiology, Faculty of Medicine, University of Airlangga, Surabaya, Indonesia
Email: drgadiprayitno@yahoo.com

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Abstract

Now molecular epidemiology was meaningful. On the surface of the tumor, cells will express its antigen specific as a tumor cell (example: TSA, tumor specific antigen) and can induce cellular immune response. The result of interactions between group antigens with the immune system cells of the body will cause a rise in the expression of lymphocytes CD8+. The aim of this research is to find out differences in the number of lymphocytes CD8+ expression between benign and malignant tissues. This research is a laboratory experiment with the approach of cross sectional. Samples are taken from benign and malignant tissue biopsy of the breast and cervical uterine that were got from anatomical pathology laboratory, period January to February 2004. A technique using random sampling, is sample acquiring 30 benign cancer and 30 malignant of the breast or cervical uterine. To find out the significance of the difference in the number of lymphocytes CD8+ between benign and malignant of breast or cervical uterine, we used a statistical analysis Anova in SPSS for Windows 15.0 program. In this research the number of lymphocytes average in the benign cancer is 2.9667 cells (breast) and 4.2667 cells (cervical uterine), on the other side malignant tissue of 23.8000 cells (breast) and 25.0333 cells (cervical uterine). From the statistical analyses with Anova the number of lymphocytes CD8+ was very significant differences between benign and malignant of the breast or cervical uterine tissue ($p < 0.001$). The conclusion of this research is that there is a significant increase of the number of lymphocytes CD8+ expression in cancer tissue.

Keywords

Cancer, Lymphocyte, CD8+, Cellular Immune Response

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1. Introduction

A tumor is induced by a chemical substance or viruses or tumor that occurs spontaneously for unknown, and on their cell surface going to express an antigen tumor specific (TSA: a tumor specific antigen) that was not found in the normal network. These antigens are foreign and may cause immune response. Assumption is that the immune system can hold role in the destruction of tumor cells of having been proposed for a long time [1] [2]. Immune mechanism works against tumor essentially same, namely as a mechanism in forming response to foreign matter another [3] [4]. Cellular immunity more plays a role in tumor immunity than humoral immunity [1] [5]. On examination of Anatomic Pathology of tumor infiltration, it is often found that the cells consist of phagocytes cells, lymphocytes cells, mononuclear cells, mast cells and plasma cells [6]. Results of the interaction of a small number of lymphocytes by antigen groups will lead to a rise in the number of certain types of lymphocytes [7]. T lymphocytes play a role in a variety of different immunological functions, *i.e*. as effectors on cellular immune response and as a regulator which will set both the immune responses [8]. T lymphocytes CD8+ are either alone or in conjunction with other T lymphocytes; the subject is important in the expression of cellular immunity. Deviations or imbalances in the supervisory mechanisms of the immune system are now thought to be involved in the growth of neoplasm [4] [9].

Cancer is a disease cause of death as the second largest disease after cardiovascular disease [10] [11]. Cancer is a disease cells with a disorder or failure on mechanism of multiplication and other functions of homeostasis on organism multi cellular [12] [13]. Cancer is caused by mutations or activation abnormal gene that controls cell growth and mitosis of the cells [14] [15]. Cancer cells disturb master of the house because it could cause inconsistence, as a result of growth of a tumor destruction of tissue placing a tumor developed and metastasized, secondary of systemic disorders as a result [12] [16]. Cancer of the cervical of the uterus is the type of cancer that occurs most often in developing countries and number two around the world [17] [18]. Cervical cancer is found in all age, but rarely under the age of 20 years, most frequent between the ages of 40 - 80 years [19]. Breast cancer occupies the highest place, second death due to cancer in women [20]. About 1 of 10 - 12 of woman will experience the breast cancer during his life [21]. Most strike age group of 40 - 70 years, but the risks will continue to increase in line with increasing age [22].

2. Method

This research is laboratory experimental with the approach of cross sectional. Samples are taken from the tissue of the breast and cervical uterine cancer. Tissue made paraffin block then cut using microtome. Staining was done with Hematoxylin Eosin (HE). The breast and cervical uterine diagnosed as a cancer will be enforced through examination in histo-phatologi view in the anatomic pathology laboratory. An enumeration of lymphocytes performed with help of a light microscope on a scaled up 200× and 400×. The data collected in form of the number of lymphocytes taken from 1 roomy tissue of view there are 100 cells. Immunohistochemistry stain is done with TSA-indirect method (NEN life science products, Renaissence) used monoclonal antibody again CD8+ (1:500) produced by Santa Cruz. Photo microscopic a collected via a ×100 objective lens. The data collected an analysis by Anova to tell the number of lymphocytes has difference between the benign tissues and malignant tissue on standard $p < 0.05$.

3. Result

Obtained from the data the number of lymphocytes as served on the following this:

1) In **Figure 1** and table 1 we can saw the picture of an expression of lymphocytes that stained by Hematoxylin Eosin (HE). Dot blue-red is a lymphocyte (arrow) in the benign tissues was count 2.9667 cells in breast and 4.2667 cells in cervical uterine (A) and malignant that count 23.8000 cells in breast (B) and 25.0333 cells in cervical uterine (C).

2) From **Figure 2** and **Table 1** we can saw also the picture of an expression of lymphocytes that stained by Hematoxylin Eosin (HE). Dot blue-chocolate is a lymphocyte CD8+ (arrow) in the benign tissues was count 7.6667 cells in breast and 7.1667 cells in cervical uterine (A) and malignant that count 16.700 cells in breast (B) and 16.200 cells in cervical uterine (C).

3) The result from data analysis (**Table 2**) there had a significant different between benign tissue and malignant tissue either in breast or cervical uterine ($p \leq 0.001$) in lymphocyte and lymphocytes CD8+ expression.

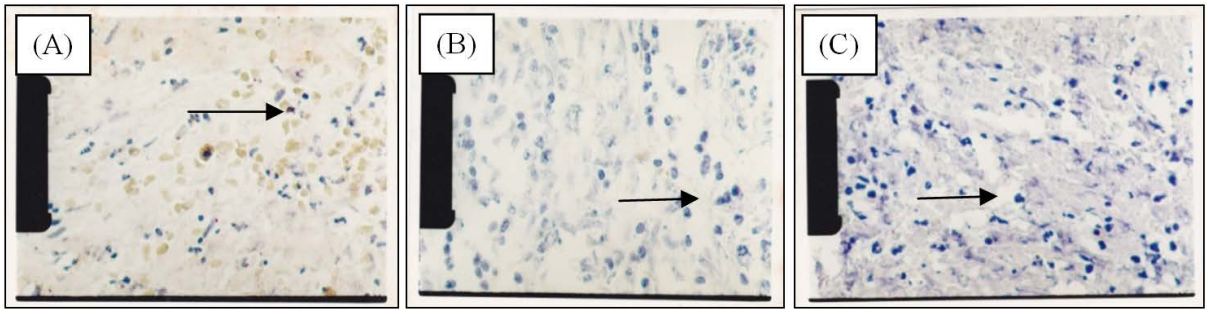

Figure 1. Picture of an expression of lymphocytes that stained by Hematoxylin Eosin (HE). Dot blue-red is a lymphocyte (arrow) in the normal tissues was count 2.9667 cells in breast and 4.2667 cells in cervical uterine (A) and cancer that count 23.8000 cells in breast (B) and 25.0333 cells in cervical uterine (C).

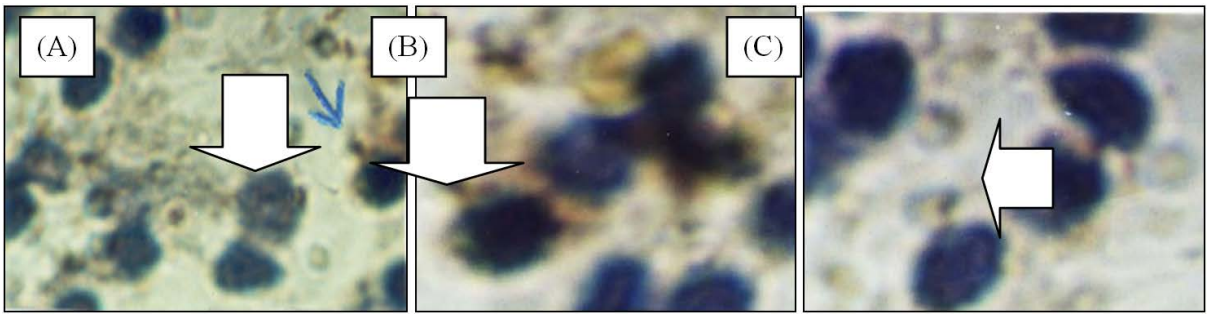

Figure 2. Picture of an expression of lymphocytes that stained by Hematoxylin Eosin (HE). Dot blue-chocolate is a lymphocyte CD8+ (arrow) in the normal tissues was count 7.6667 cells in breast and 7.1667 cells in cervical uterine (A) and cancer that count 16.700 cells in breast (B) and 16.200 cells in cervical uterine (C).

Table 1. Descriptive an expression of lymphocytes and lymphocytes CD8+ in the normal tissues of breast and cervical uterine, cancer tissue of breast and cervical uterine.

Tissue		N	Mean	Std. deviation	Std. error	95% confidence interval for mean		Minimum	Maximum
						Lower bound	Upper bound		
Breast	1.00	30	2.9667	1.51960	0.27744	2.3992	3.5341	1.00	6.00
	2.00	30	23.8000	8.54360	1.55984	20.6098	26.9902	11.00	50.00
	Total	60	13.3833	12.13915	1.56716	10.2475	16.5192	1.00	50.00
Cervical uterine	1.00	30	4.2667	0.98027	0.17897	3.9006	4.6327	3.00	7.00
	2.00	30	25.0333	3.13471	0.57232	23.8628	26.2039	20.00	30.00
	Total	60	14.6500	10.72116	1.38410	11.8804	17.4196	3.00	30.00
Breast CD8+	1.00	30	7.6667	2.65659	0.48502	6.6747	8.6587	3.00	15.00
	2.00	30	16.7000	3.97536	0.72580	15.2156	18.1844	6.00	25.00
	Total	60	12.1833	5.65533	0.73010	10.7224	13.6443	3.00	25.00
Cervical uterine CD8+	1.00	30	7.1667	2.06920	0.37778	6.3940	7.9393	4.00	11.00
	2.00	30	16.2000	3.64266	0.66506	14.8398	17.5602	10.00	23.00
	Total	60	11.6833	5.41965	0.69967	10.2833	13.0834	4.00	23.00

4. Discussion

The journey started from normal cells of cancer disease, increasing growth of the cell, a benign tumor, precancerous lesion, cancer, and metastases that reflects the process of multi steps [23]. The transformation to malignant of cell can accompanied by change the phenotypic of normal cell and loss of an antigen the surface, or with

Table 2. Anova analysis an expression of lymphocytes CD8+. There have a significant different between normal tissues and breast cancer or cervical uterine cancer.

		Sum of squares	df	Mean square	F	Sig.
Breast CD8+	Between groups	1224.017	1	1224.017	107.084	0.0001
	Within groups	662.967	58	11.430		
	Total	1886.983	59			
Cervical uterine CD8+	Between groups	1224.017	1	1224.017	139.485	0.0001
	Within groups	508.967	58	8.775		
	Total	1732.983	59			

the onset of neo-antigen [1]. Although a tumor derived from own tissues (self), in general tumor expressing an antigen they are known by the immune system as an antigen foreign [24]. It can be evidenced prove the existence of an antigen tumor [9]. An expression of tumor specific antigens on a tumor cell cause tumors regarded as foreign material. A tumor tending to arising on the site of a heavenly, and area of the body that even an foreign antigen also failed to elicit immune response. Mammary glands are the preferred location and tumors that grow there can be immunogenic tumor when running out of the fat pads of mammary glands [2].

The immune system is able to recognize foreign molecules (antigens), and then generate the appropriate reaction is to get rid of these foreign molecules [24]. Cellular immunity more plays a role in tumor immunity than humoral immunity [2]. At the initial stage (initiation) immune response, a group of functional cells called APCs (Antigen Presenting Cells) capture antigens and then presented it to the lymphocytes in a form that can be recognized by lymphocytes. Antigen recognition processes carried out by the main elements of the immune system *i.e*. lymphocytes which are then followed by the effectors phase involves a variety of cell types [24]. One opinion mention that to the examination of a tumor in Pathology of Anatomy, often found infiltration of the cells which is composed of cells of mononuclear, a phagocyte a lymphocyte, a little plasma cells and cell mastosit [1]. There is evidence to support the presence of the role of the immune system in against cancer, that is the invention infiltration of mononuclear cells, which consists of T cells, a cell NK, and macrophages on the site of a tumor [24]. In clinicopathology showed that the rise of a lymphocyte in tumor deals with the better prognosis than no infiltration of lymphocytes [25].

T cells lymphocyte effectors is a primer on cellular immunity, with a subset of T cells that can develop into of Cytotoxic T cells lymphocyte, that can cause lysis of foreign cell or cells infected with the virus. Lymphocyte T cells arise from stem cells in the bone marrow that migrate to the thymus [8]. During maturation in the thymus, T cells expressing the antigen bindings unique in the surface cell [26]. In an experimental trial proven that of Cytotoxic T cells lymphocyte (CTL) produce immune response antitumor being effective. A tumor cell producing the proteins that are not expressed on normal cell, this protein will expressed together MHC class I will be identified by of Cytotoxic T cells lymphocyte. In this cased a tumor cell function as Antigen Presenting Cells (APCs) which presents the proteins themselves to T cells [24]. Other possibilities about not the success of the immune response against cancer evidenced by an experiment where a small amount of a sensitized lymphocyte founded, stimulating growth of a tumor while large quantities inhibit tumor cells [2]. The results of the interaction of a small number of lymphocytes with clusters of an antigen would cause an increase in the number of lymphocytes [8].

5. Conclusion

Conclusion of this research is that there was a significant increase in the number of lymphocytes CD8+ expression on cancer tissue.

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