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Opinion: AIDS and some oncological diseases

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Abstract

There is a frequent occurrence of oncological diseases in HIV-induced AIDS. Among this diseases Kaposi's sarcomas occur in 30% of all cases, malignant lymphomas-in 8 to 10% of patients. Also, they appeared lymphogranulomatosis, Burkitt's lymphoma, ,histiocytic lymphoma and lung's adenocarcinomas, myelomas, hepatomas and so on. The number of HIV-infected patients with oncological patients drastically increases. The solution of this problem may bring serious contribution in oncology.

Keywords: Cell fusion; Kaposi sarcoma; AIDS; Fusogenic agent

1 Introduction

The development of oncological diseases in 40% of patients ill with AIDS provokes great interest [1-5]. Kaposi sarcoma (KS), out of them, is observed in approximately 30%, while lymphomas in 8-10% of patients. Infrequently met are lymphogranulomatosis (Hodgkin's disease), Burkitt lymphoma, hepatoma, etc. Special mentioned should be made of the fact that KS in normal human population constitutes only an insignificant part (0.02%) of all the tumours.

At the same time, KS was not found specific only for HIV-induced AIDS,for the tumour of this histogenesis is also observed in the case of AIDS developed by different medical preparations or toxins.. For example, in the case of AIDS induced by chronic intoxication of dioxine, the risk of development of KS and lympomas significantly increases. By the way, such sarcoma is also rather frequently observed during allotransplantations.

In the case of immunodeficiency of different genesis, different (sometimes incompatible) interpretations are used to explain a dramatic rise in the incidence of oncological diseases. The most accepted and popular among them are the following:

- In the case of HIV-induced AIDS, oncological diseases allegedly arise as a result of the oncogenic action of retroviruses. Irrespective of the fact that almost all genera of the retroviruses family possess oncogenic potential, it has been found that the HIV genome is free from any cellular oncogene;
- According toBurnet's clonal selection theory [6], spontaneously transformed cells, which are eliminated by immune forces, permanently arise in the body. Upon weakening of the immune status (owing to various factors, including under the effect of viruses), which is the principal symptom for AIDS, a possibility of forming malignant cells is to allegedly significantly rise. In addition, it should be said that the Burnet's theory fails to adequately explain the cause of the origin of Kaposi sarcoma and lymphomas in the case of AIDS. Why the given nosology should develop in most cases? In addition, it has been allegedly finally established that the immune deficiency is outcome of the tumour process development rather that the cancer cell development cause [7]. In particular, it has been found that the immune system suppression is not the Kaposi sarcoma origin cause, since

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the given pathology develops in the early stages of infection with HIV or before a significant suppression of the body's immune status;

- Not infrequently, increase in the incidence of oncologic diseases in the case of AIDS is considered as a result of the oncogenic effect of the persistent latent viruses (herpesviruses, adenoviruses, etc.) in the body. This view also fails to adequately explain the specific causes of the development of Kaposi sarcoma and lymphomas.

Thus, in the case of both the HIV-induced AIDS and the AIDS of other genesis, Kaposi sarcoma is frequently observed, which damages in the first turn skin, blood vessels, also practically all visceral organs.

It has also been established that Kaposi sarcoma's cellular substrate represents the so-called spindle-like cells. At this time, skin is frequenter considered as an organ of immunogenesis, where cells (T- and B-lymphocytes) interact with skin macrophages – Langerhans cells, epidermocytes and other skin cells.Some subpopulations of T-lymphocytes also migrate in skin, while epidermis develops a hormone, which facilitates differentiation of T-lymphocytes. It is also known that HIV may, together with immunocompetent cells, damage the skin epithelial cells and the Langerhans cells (skin macrophages) localized in the same organ.

Based on the above, such a frequent manifestation of Kaposi sarcoma might be associated with the fusion of T-lymphocytes by means of HIV with the Langerhans cells or epidermocytes, which can be followed by the formation of spindle-likecells, which seemingly represent malignant cells of hybrid origin.

At the same time, the fact that Kaposi sarcoma has not been found specific only for the HIV-induced AIDS allegedly indicates that an etiological agent of the tumour of this histogenesis can, save HIV, also be other agent or factor.

It should be said that the Kaposi sarcoma's cellular substrate (or spindle-like cells) by some morpho-physiological parameters strongly resemble macrophages. In particular, they not infrequently reveal the signs of phagocytic activity, which is expressed by the existence in their cytoplasm of erythrocytes or hemosiderin granule. It is more expectable given that Langerhans cells represent specific skin macrophages.

Account should be taken of the circumstance that the malignant substrate can be initiated by a very small number of precancerous cells (1 cancer cell from about 1.000.000 precancerous cells), while their bulk cannot be transformed into a cancer cell and is finally eliminated.

The cell fusion process might facilitate the immune deficiency development (owing to the formation on nonviable polykaryocytes consisted of immunocompetent cells) and the development of AIDS, tumours of different histogenesis (frequenter of Kaposi sarcoma and lymphomas) owing to the formation of dikaryons.

Practically all the agents, factors or effects facilitating cell fusion can be considered in principle as a possible cause of a malignant process, also of immunodeficiency, as well as concurrent realization of these two, diametrically different pathological processes.

As we assume, in the case of a relatively small dose (or intensity) of the fusogenic agent or factor, a relatively small number of cells will participate in the fusion process. At that, the fusogeny process suspension in the dikaryon formation stage should be practiced frequenter than the formation of polykaryocytes. And *vice versa*, in the case of large doses (and/or high intensity), a relatively larger number of cells will take part in fusogeny, which, in most cases, is sufficient for forming nonviable polykaryocytes [8,9].

According to the latest statistical data, the incidence of Kaposi sarcoma is significantly reduced in patients receiving antiretroviral therapy [10,11]. We believe that antiretroviral therapy should be playing a key role in this case by impeding the replication and, subsequently, virulence of HIV infection. Therefore, the frequency of cell fusion decreases significantly.

2 Conclusion

In the last years, scientists paid great attention to a frequent appearance of oncologic diseases of definit origin in HIV-induced AIDS.

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Compliance with ethical standards

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Disclosure of conflict of interest

There is no conflict of interests between the authors of this work.

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