Recent Clinical Observation on the Changes of Immune Function of Advanced Lung Cancer Before and after Chemoradiation Therapy

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Abstract: Objective: To investigate the changes of immune function of advanced lung cancer before and after chemoradiation therapy. Methods: The objects of this study were 60 patients with advanced lung cancer who were diagnosed and treated in our hospital from June 2018 to August 2019 (observation group). All of them were treated with chemoradiation therapy. Another 60 healthy subjects in our hospital at the same time were selected. The levels of T lymphocyte subsets (CD3 +, CD4 +, CD8 +, ratio of CD4 + / (CD8)) and immunoglobulin (IgA, IgM, IgG) were observed. Results: Compared with the control group and before chemoradiation therapy, the levels of CD3 +, CD4 +, CD4 + / CD8 + in the observation group after chemoradiation therapy were lower and CD8 + was higher ($P < 0.05$), and the levels of IgA, IgM and IgG were lower ($P < 0.05$). Conclusion: After chemoradiation therapy, the cellular and humoral immune function of patients with advanced lung cancer will be decreased.

1. Introduction

For lung cancer, long-term heavy smokers are at high risk of the disease. According to relevant data, compared with non-smokers, those with a smoking index of more than 400 had more than 20 times the incidence of lung cancer. Meanwhile, another high risk factor for lung cancer is air pollution. Compared with rural areas, the incidence rate of lung cancer in city is higher [1]. At present, lung cancer, a malignant tumor, has a great threat to human life and health, so we must strengthen the early detection and prevention of lung cancer. Lung cancer patients have weaker cellular immune function, and their humoral immune function is more sthenic in the early stage of the disease, which will significantly reduce the humoral immune function in the advanced stage. And chemoradiation therapy will also affect the immune function of patients to a large extent [2]. This paper mainly discusses the changes of immune function of advanced lung cancer before and after chemoradiation therapy.

2. Data and Methods

2.1 General Data

The objects of this study were 60 patients with advanced lung cancer (observation group) who were diagnosed and treated in our hospital from June 2018 to August 2019. All of them were treated with chemoradiation therapy. Another 60 healthy subjects in our hospital at the same time were selected. In the observation group, there were 32 males and 28 females with an average age of (59.63 ± 8.67) years; in the control group, there were 31 males and 29 females with an average age of (61.37 ± 8.57) years. There was no difference in general data between the two groups ($P > 0.05$), so the two groups can be compared.

2.2 Methods

During 7 days before treatment and 10 to 14 days after treatment, every patient in the observation group was collected 3ml fasting venous blood in the morning, and the blood was

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anticoagulated with heparin, and the mononuclear cells were separated. T lymphocyte subsets were detected by flow cytometry. Immunoglobulin was detected by immunodiffusion method.

2.3 Observation Indicators

The levels of T lymphocyte subsets (CD3 +, CD4 +, CD8 +, ratio of CD4 + / (CD8)) and immunoglobulin (IgA, IgM, IgG) of the two groups were observed.

2.4 Statistical Analysis

This study used SPSS22.0 as statistical software. The measurement and counting data was expressed by "($\bar{x}$ ±s)"and [n(%)]."t"test and "x^2"test were adopted. $P < 0.05$ means the differences have statistical significance.

3. Results

1) Comparison of T lymphocyte subsets: compared with the control group and before chemoradiation therapy, CD3 +, CD4 +, CD4 + / CD8 + in the observation group were lower after chemotherapy, and CD8 + was higher ($P < 0.05$), as is shown in Table 1.

Table 1 Comparison of T Lymphocyte Subsets($\bar{x}$ ±s)

Inspection Index		CD3+(%)	CD4+(%)	CD8+(%)	CD4+/CD8+
Control Group(n=60)		77.52±5.68	46.31±3.63	26.20±2.15	1.75±0.62
Observation Group(n=60)	Pre-chemoradiation therapy	60.34±4.06[a]	38.10±3.03[a]	33.18±3.06[a]	1.15±0.47[a]
	Post-chemoradiation therapy	52.65±3.26[ab]	32.57±3.28[ab]	34.56±3.11[ab]	0.95±0.28[ab]

Note: Compared with the control group, [a]P<0.05; compared with the pre-chemoradiation therapy, [ab]P<0.05.

2) Comparison of immunoglobulin levels: compared with the control group and before chemoradiation therapy, the levels of IgA, IgM and IgG in the observation group after chemoradiation therapy were lower ($P < 0.05$), as is shown in Table 2.

Table 2 Comparison of Immunoglobulin Levels($\bar{x}$ ±s,g/l)

Inspection Index		IgA	IgM	IgG
Control Group(n=60)		1.77±0.33	1.12±0.31	12.87±3.03
Observation Group(n=60)	Pre-chemoradiation therapy	1.61±0.50[a]	0.70±0.16[a]	10.85±3.24[a]
	Post-chemoradiation therapy	1.48±0.30[ab]	0.41±0.26[ab]	7.40±2.11[ab]

Note: Compared with the control group, [a]P<0.05; compared with the pre-chemoradiation therapy, [ab]P<0.05.

4. Discussion

The incidence rate of lung cancer, the malignant tumor, is high in clinic, and has a relatively low clinical cure rate. Influenced by various adverse factors, the mortality and incidence rate of lung cancer patients have been obviously increased. Lung cancer ranks the first place in all malignant tumors and poses a great threat to the life and health of patients. Therefore, in order to improve the prognosis of patients and ensure their life and health, it is particularly important to strengthen the early detection and treatment of lung cancer. At the same time, developing good living habits and eating habits, breathing less polluted exhaust gas and air, and maintaining a peaceful attitude play a very important role in disease prevention [3].

Under normal conditions, the anti-tumor immune effect is mainly cellular immunity, and main part of cellular immunity is lymphocytes, especially T-lymphocytes and their subsets. Therefore, T lymphocyte response plays an important role in antitumor cell immunity [4]. The anti-tumor immune

response T cells mainly consist of two subsets: MHC class II antigen limited TH cells and MHC class I antigen limited TC cells, while CD4 + T cells belong to MHC class II antigen limited TH cells and CD8 + T cells belong to MHC class I antigen limited Tc cells. The killing effect of B cell and its antibody is humoral immunity of tumor. These antibodies are mainly IgG and a few IgM, which can inhibit the proliferation of tumor cells and avoid tumor metastasis. In the immune balance state, the body can play its monitoring role. For lung cancer patients, the immune active cells are inhibited, and the disorder of T-lymphocyte subsets is the main clinical manifestation, such as reducing CD4 + / CD8 +, increasing CD8 +, reducing CD4 + and so on [5]. In tumor microenvironment, there are many factors that inhibit immune response, such as reducing the expression or absence of MHC class I molecules on tumor surface,activation of immunosuppressive cells and peripheral tolerance of T cells. The commonly used anticancer drugs can inhibit humoral immunity and cellular immunity, so as to affect the immune function of the body. However, it has a very complex clinical evaluation on the inhibition of the immune system, which not only affects the immune monitoring function due to the immunosuppression, but also enhances the host's response to the tumor by inhibiting or killing the tumor cells [6].

This paper discusses the changes of immune function of advanced lung cancer before and after chemoradiation therapy. The results showed that compared with the control group and before chemotherapy, the levels of CD3 +, CD4 +, CD4 + / CD8 + were lower in the observation group after chemoradiation therapy, and the levels of IgA, IgM and IgG were also lower, all having statistical significance ($P < 0.05$). In conclusion, the cellular and humoral immune function of patients with advanced lung cancer will be reduced after chemoradiation therapy. Therefore, for patients with middle and advanced lung cancer, especially who were treated by chemoradiation therapy, it is necessary to strengthen the reconstruction of the body defense system, so that the immune function of the body can be significantly improved. It is also necessary to closely monitor the T cell subsets of patients, so as to better guide clinical chemotherapy and accurately evaluate the prognosis of the disease.

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