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Expression differences of serum prealbumin in benign and malignant colorectal tumors

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Abstract ***Objective:*** The aim of the study was to investigate the expression differences of serum prealbumin in patients with benign and malignant colorectal tumors and its clinical significance. ***Methods:*** The concentrations of total protein, albumin, prealbumin, hemoglobin of 113 colorectal cancer patients (cancer group) and 87 colorectal adenomas (adenoma group) were tested in Yixing Hospital Affiliated to Jiangsu University (China) during August 2013 to December 2013. Then the differences between the two groups were compared. ***Results:*** In colorectal cancer patients, the concentrations of serum prealbumin in 39/113 cases, total protein in 16/113 cases, albumin in 38/113, hemoglobin in 32/113 were lower than normal ranges. While, in colorectal adenoma patients, the concentrations of serum prealbumin in 4/87 cases, total protein in 2/87, albumin in 1/87, hemoglobin in 2/87 were below the detection limit. Comparative analysis showed that, average expression levels of serum prealbumin, albumin, total protein, hemoglobin in colorectal cancer patients were lower than those of colorectal adenoma patients, the difference was statistically significant ($P < 0.05$), and colorectal cancer patients were more likely to have lower levels of above indicators ($P < 0.05$). ***Conclusion:*** Compared to colorectal adenoma patients, patients with colorectal cancer have lower average expression levels, and were easier to have lower expression levels of serum albumin, albumin, total protein and hemoglobin, which suggest that colorectal cancer patients are more likely to have metabolic change, and clinic notable.

Key words colorectal cancer; colorectal adenoma; prealbumin

At present, researchers generally agreed that, malignant tumor is a type of systemic consumptive disease, with complex clinical manifestations, and its etiology is still unclear. With the continuous progress of tumor, quite a number of patients have different degrees of malnutrition symptoms, which imply that tumor and metabolic abnormalities may related to each other. And, researchers have been looking for markers, which could be used to evaluate the nutritional status of human body for a long time. Till now, there were a number of studies showed that, using peripheral blood as testing sample, test of the levels of serum albumin, transferring, prealbumin, magnesium and calcium could be helpful for the evaluation of body nutritional status, but the clinical value and significance of those indexes were still not well been understood.

In order to understand whether the expression levels of serum albumin, total protein, albumin are different in patients with colorectal cancer and colorectal adenoma. This research detected the levels of serum albumin, total protein, albumin, and compared the differences between the two groups.

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Patients and methods

Patients

We selected 113 patients diagnosed with colorectal cancer by pathology (cancer group), and 87 patients diagnosed as colorectal adenoma by endoscopy and pathology (adenoma group) in Yixing Hospital Affiliated to Jiangsu University (China), during August 2013 to December 2013. In cancer group, there were 70 males and 43 females, (60.2 ± 12.5) years old, and in adenomas group, there were 50 males, 37 females, (58.2 ± 11.4) years old. The ordinary materials, such as age and gender distribution of patients, were comparable between the two groups.

Methods

The 3 mL peripheral blood were collected from each patient in the morning before breakfast, and stored at –20 ℃ before detection. Hemoglobin level were detected by Beckman Blood Cell Analyzer (USA). Detection of levels of serum total protein, albumin, prealbumin used biuret method, bromocresol green method and immuno-scatter turbidmetry, respectively.

Table 1 Expression levels of prealbumin, total protein, albumin, and hemoglobin in two groups

Groups	*n*	Prealbumin (mg/L)	Total protein (g/L)	Albumin (g/L)	Hemoglobin (g/L)
Adenoma group	87	322.13 ± 75.43	70.48 ± 5.12	43.67 ± 3.84	140.43 ± 18.24
Cancer group	113	248.80 ± 83.41	68.17 ± 7.77	39.16 ± 6.74	117.58 ± 22.04
t		6.42	2.39	5.58	7.82
P		0.000	0.018	0.000	0.000

Table 2 Expression change in two groups (*n*)

Groups	*n*	Total protein		Albumin		Prealbumin		Hemoglobin	
		Normal	Decline	Normal	Decline	Normal	Decline	Normal	Abnormal
Adenoma group	87	85	2	86	1	69	4	76	2
Cancer group	113	97	16	72	38	69	39	79	32
P		0.004		0.000		0.000		0.000	

Normal value range

Hemoglobin 104–160 g/L, total proteins 60–82 g/L, albumin 35–50 g/L, and prealbumin 200–400 mg/L.

Statistical methods

Using SPSS 16.0 software, *T*-test for measurement data, chi-square test for count data, and the difference was statistically significant when $P < 0.05$.

Results

Expression level of each group

The levels of serum prealbumin, total protein, albumin, hemoglobin of colorectal cancer patients were lower than those of the adenoma group, and the difference were statistically significant ($P < 0.05$; Table 1).

Expression change in the two groups

Compared to adenoma group, the patients with colorectal cancer were more likely to have lower levels of serum prealbumin, total protein, albumin and hemoglobin, and the differences were statistically significant ($P < 0.05$; Table 2).

Discussion

With the vigorous development of human civilization, the natural environment, which human beings rely on had changed. Some of these changes, in recent years, were found maybe had profound effect on human healthy. In the past century, the life expectancy of human beings were significantly longer. And accompanied with greater age, a heavier burden of age-related disease came, such as, various of solid tumors, blood tumor, not mentioned cardiovascular disease, diabetes, which, in turn, threaten human.

Previous researches showed that these diseases were associated with the body metabolic changes [1, 2]. In recent years, numbers of epidemiological studies had shown that, a variety of metabolic disorders were related to the occurrence and development of different kinds of malignant tumor, straight colon cancer, pancreatic cancer, breast cancer, cervical cancer and liver cancer, etc [3–7].

After continuous efforts, researchers had reported that detection of serum albumin, transferrin and prealbumin, blood magnesium and calcium, maybe helpful for the evaluation of nutrition status and metabolism status [8–10]. Although the clinical value of these indicators need to be further explored, they are using as clinical routine in daily work, and the blood sample are easy obtain, the detection method are simple and stable, the cost of detection are acceptable.

Present research was designed to detect whether the expression levels of serum albumin, prealbumin, total protein and hemoglobin are different in patients with colorectal cancer and colorectal adenoma. And the results showed that, the level of serum prealbumin in 39/113 (34.5%) colorectal cancer patients and 4/87 (4.6%) colorectal adenoma patients were lower than normal; serum total protein levels of 16/113 (14.2%) colorectal cancer patients, and 2/87 (2.3%) colorectal adenoma patients were declined; and levels of albumin and hemoglobin in 33.6% (38/113), 28.3% (32/113) colorectal cancer patients were dropped, while only those of 1/87 and 2/87 cases were slightly lower than normal in adenoma group, respectively. Further analysis showed that, the average expression levels of serum albumin, prealbumin, total protein and hemoglobin in colorectal cancer patients were significantly lower than those of adenoma patients ($P < 0.05$), and the colorectal cancer patients were more likely to have lower levels of serum albumin, prealbumin, total protein and hemoglobin. Our results were accordance with previous researches results.

Above results suggest that, in comparison with patients with colorectal adenoma, patients with colorectal cancer have and more likely to have lower levels of serum albumin, prealbumin, total protein and hemoglobin, which

suggest that colorectal cancer patients may have more apparent metabolic changes than colorectal adenoma patients, and the change is clinic notable.

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