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The level of D-dimer in patients with basal cell skin cancer in the immediate and remote postoperative period

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ABSTRACT

The level of D-dimer in the blood was determined in 36 patients with basal cell skin cancer. The analysis was made before the surgical treatment, on the first postoperative day, on the third, fifth, seventh, and tenth postoperative days, and in 18 months after the operation. For comparison, the blood D-dimer level was determined in 17 relatively healthy volunteers of the same age and sex (comparison group 1), and in 20 patients operated on for skin fibroma (comparison group 2) of the same age and sex as the patients in the main group.

In patients with basal cell skin cancer the blood D-dimer level was elevated before the start of surgical treatment. On the first postoperative day the level increased sharply, then it gradually decreased, but did not restored to normative values, and it was elevated both in the immediate and in the remote postoperative period.

The absence of a return to the normal level of D-dimer in the blood in the immediate and remote postoperative periods in patients with basal cell skin cancer indicates disturbances of rheological blood properties in this category of patients.

Introduction

According to the literature the share of malignant skin lesions in the structure of oncological pathology is 11–12% [1], and recently there has been a sharp increase in the incidence of basal cell carcinoma: 75.0–96.8% of all malignant epithelial neoplasms of the skin [2, 3]. Basal cell skin cancer is a malignant epithelial tumor that grows locally with invasion and destruction of local tissues and rarely metastasizes [2]. This type of tumor is found on the skin of the head and neck (98.3%) including the nose — in 39.0% of cases, the skin of the cheeks — in 16.5%, the skin of the auricle and in the parotid region — in 11.4% of cases [4]. The main etiological factors include exposure to ionizing radiation. This disease develops against the background of changes in both the rheological properties of the blood and the immune system [4].

Aim of the Research

To study changes in the level of D-dimer in the blood of patients with basal cell skin cancer before the surgical treatment and in the postoperative period.

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Materials and Methods

The study of changes in the blood D-dimer levels was carried out in 36 patients with basal cell skin cancer. The analyses were made before the surgical treatment, on the first postoperative day, on the third, fifth, seventh, and tenth postoperative days, and in 18 months after the operation. For comparison, the blood D-dimer level was determined for 17 relatively healthy volunteers of the same age and sex (comparison group 1) and 20 patients operated on for skin fibroma (comparison group 2); age and sex of patients from comparison group 2 were the same as in the main group; the study of parameter was carried out during the same period. All patients received outpatient and inpatient treatment in medical institutions of the city of Engels and Saratov in the period from 1999 to 2012. The average age of the patient population was 61 ± 2 years.

Diagnosis of skin tumor mass was based on the analysis of complaints, data of anamnesis, and laboratory diagnostics of tumor mass. The laboratory diagnostics most commonly used cytological examination and skin biopsy with the usual coloring of hematoxylin-eosin.

The presence of oncological skin process corresponding to type T1-2N0M0 according to TNM classification were the criterion for inclusion in the study.

Dissemination of the process, the presence of metastases in lymph nodes and internal organs, and carrying out chemo- and radiation therapy became the exclusion criteria.

The analyses of the D-dimer levels were performed using the Triage® MeterPro immunofluorescence analysis system (BIOSITE, USA).

The obtained data were processed by variation statistics of the medical-biological profile. The processing included calculating of medians and upper and lower quartiles, as well as determining the reliability of the differences (p) using the Mann — Whitney test for independent groups and the Wilcoxon test for dependent ones. For this purpose a personal computer with Statistica 6.0 and Excel (Microsoft, 2003) software was used.

Results and Discussion

The results of the study in patients with basal cell skin cancer compared with the other groups are presented in the table.

As it can be seen from the table in patients with basal cell skin cancer there is a considerable and statistically significant increase in the level of D-dimer in the blood before surgery; the increase can be considered specific and it is confirmed by the data obtained in the comparison group of patients with benign skin tumors, in which D-dimer level was not significantly different from healthy people.

When studying in dynamics it was revealed that on the first postoperative day a sharp increase in this parameter occurs. It should be noted that the increase in D-dimer was registered in both groups of patients — with basal cell cancer and with benign skin tumors; the data obtained were statistically significant ($p < 0.05$). In our opinion, the detected increase in D-dimer is not specific in nature and can be regarded as the body's response to surgical trauma.

On the third postoperative day no significant changes in the level of D-dimer were detected in both study groups. The studied parameters were almost identical to the results obtained in the first postoperative day.

By the fifth postoperative day in the group with basal cell skin cancer a slight decrease in the D-dimer level was recorded, but in comparison with the group of relatively healthy people it still remained elevated; the obtained data were statistically significant ($p < 0.05$). At the same time in the group with benign tumors the level of D-dimer was almost equal to the data in the group of relatively healthy people.

On the seventh postoperative day there were no significant changes in the level of D-dimer in the group of patients with benign skin tumors. The studied parameter was not significantly different from the level recorded on the fifth postoperative day. In the group of patients with basal cell skin cancer no significant changes were also detected; the studied parameter was statistically significantly increased in comparison with

D-dimer level in the studied groups (M ± m)

D-dimer (ng/mg)	Basal cell skin cancer (n = 36)	Benign skin tumors (n = 20)	Relatively healthy subjects (n = 17)
On admission	689 ± 0.1*	472 ± 0.3	477 ± 0.3
1st day after surgery	967 ± 0.2*	594 ± 0.2*	478 ± 0.3
3rd day	954 ± 0.3*	621 ± 0.3*	476 ± 0.3
5th day	675 ± 0.3*	485 ± 0.1	476 ± 0.3
7th day	673 ± 0.2*	471 ± 0.1	478 ± 0.3
10th day	679 ± 0.1*	481 ± 0.2	477 ± 0.3
18 months	674 ± 0.1*	463 ± 0.1	467 ± 0.1

* Statistical confidence ($p < 0.05$) compared with relatively healthy subjects.

the data of both relatively healthy people and those operated on for benign tumors.

On the tenth postoperative day the studied parameter in the groups of basal cell skin cancer and benign skin tumors was restored to the level recorded before the onset of operative treatment; in the group of patients with benign skin tumors the results corresponded to those obtained in the comparison group of relatively healthy people, and in the group of patients with basal cell cancer they were statistically significantly increased.

When studying the level of D-dimer in the remote postoperative period no significant changes were noted. The results were almost identical to the data on the tenth postoperative day.

Thus, operative treatment of patients with basal cell skin cancer does not lead to restoring of the D-dimer level both in the immediate and in the remote postoperative period.

Since the study of the D-dimer level refers to the markers of the thrombolytic process and the excess of its level above the threshold value (500 ng/mg) is considered as a manifestation of thrombotic complications, it can be assumed that patients with basal cell skin cancer are a group that has potential risk of thromboembolic complications, despite the absence of clinical signs of the latter. In addition, patients of this group may have signs of chronic latent disseminated intravascular coagulation, but this assumption requires further study. All this must be taken into account when managing patients with basal cell skin cancer.

Conclusion

On the basis of the conducted study we can draw the following conclusions:

1. Before the start of surgical treatment patients with basal cell skin cancer show increase in the level of D-dimer in the blood.

2. In the process of surgical treatment of basal cell skin cancer the maximum increase of the level of D-dimer in the blood is registered on the first postoperative day.

3. Surgical treatment of patients with basal cell skin cancer does not lead to restoring of the level of D-dimer in the blood.

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