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Concentration of selected adipokines and osteopontin in patients with nasopharyngeal carcinoma

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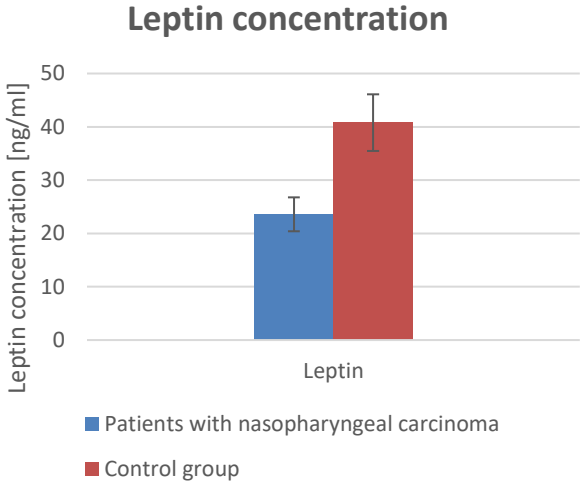
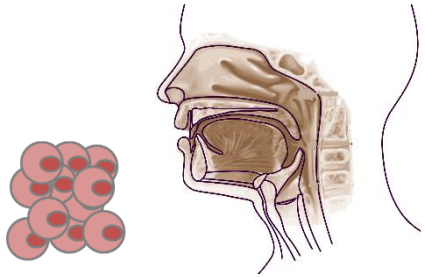
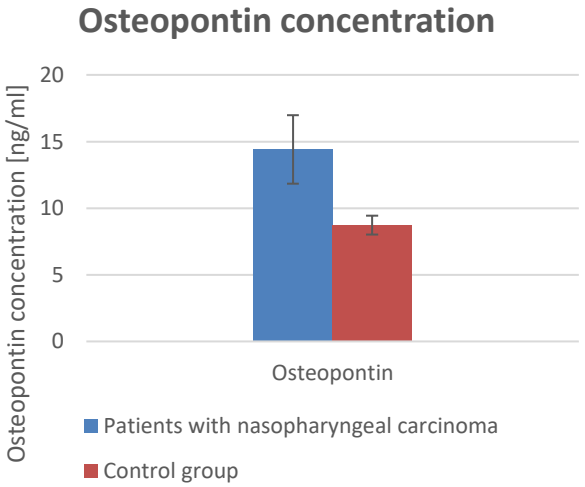
CENTRUM ONKOLOGII

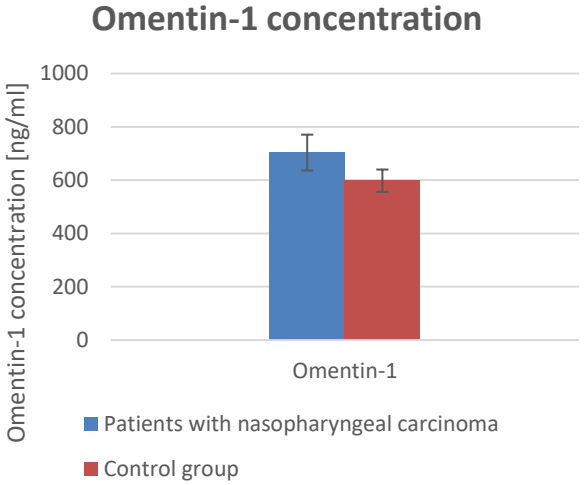
Concentration of selected adipokines and osteopontin in patients with nasopharyngeal carcinoma

Graphical Abstract









Abstract: Nasopharyngeal carcinoma and neoplasms located in the facial skeleton are not quite common. It is estimated to affect about 1 in 100,000 people, with slightly greater intensity in southeast China, North Africa and Middle East. So far, little is known about how the concentration of adipokines is shaped in people suffering from these cancers. The aim of the study was to estimate the level of selected adipokines (leptin, omentin-1) and osteopontin in patients with nasopharyngeal carcinoma just prior to treatment with ionizing radiation.

The test material was serum obtained from venous blood from the test group (n = 20) and the healthy control group (n = 20). The concentration of leptin, omentin-1 and osteopontin was measured by enzyme immunoassays (ELISA).

The statistical analysis of the obtained results shows significant differences in the levels of the examined parameters between the groups. Leptin levels were significantly lower in nasopharyngeal carcinoma patients compared to healthy subjects. On the other hand, omentin-1 and osteopontin levels were lower in the control group.

Due to the low prevalence of the described neoplasms, not much is known about the role of adipokines in the pathogenesis and course of nasopharyngeal carcinoma and neoplasms located in the facial skeleton. Publications indicate that the level of osteopontin may be related to the rate of disease development and the degree of malignancy. Adipokines may become useful markers for assessing the risk of developing and severity of the disease.

Keywords: adipokines, leptin, omentin-1, osteopontin, nasopharyngeal carcinoma

Introduction

- Nasopharyngeal carcinoma (NPC) belongs to the group of head and neck neoplasms.
- In Poland, there are about 3,600 cases of nasopharyngeal carcinoma among men and about 1,000 cases among women every year. Moreover, NPC have a high mortality rate of 55-65%.
- It has been determined that NPC affects 1 person or 100,000 worldwide.
- Infection with the Epstein-Barr virus and smoking are the main risk factors for the development of NPC.
- Treatment methods include ionizing radiation (radiotherapy), chemotherapy and surgery.

Introduction

- According to the WHO classification, 3 types of NPC are distinguished:
  - type 1: squamous cell carcinoma,
  - type 2: non-keratinizing carcinoma,
  - type 3: undifferentiated carcinoma.
- The substances secreted by white adipose tissue are called adipokines. It is a large group of compounds with a broad spectrum of action, including leptin and omentin-1.
- Osteopontin is mainly biosynthesized by fibroblasts, osteoblasts and osteocytes.

- The aim of this study was to assess the concentration of selected adipokines (leptin and omentin-1) and osteopontin in patients with nasopharyngeal carcinoma just prior to the treatment with ionizing radiation.

Materials and Methods

- Venous blood samples taken from a ulnar vein by qualified medical personel was the test material.
- The blood samples were centrifuged to obtain blood serum. Then the samples were frozen at – 80 ˚C until the tests were performed.
- The study group consisted of patients with nasopharyngeal carcinoma just prior to the treatment with ionizing radiation.
- The research was conducted using ready-made enzyme-linked immunosorbent assay kits (ELISA).

Table 1. Characteristics of the studied groups.

	Patients with nasopharyngeal carcinoma	**Helathy control group**
N	20	20
Age	48 - 70	40 - 65
Sex	16 male and 4 female	4 male and 16 female

Results - leptin

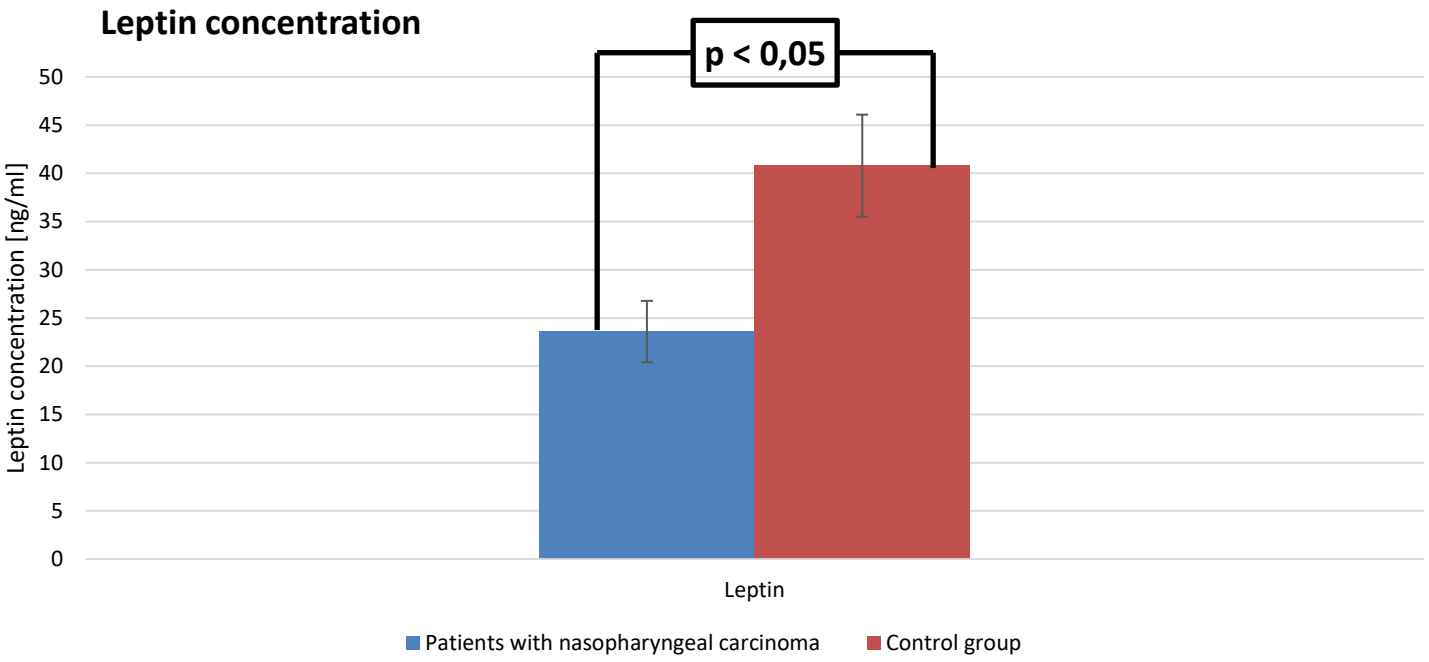


Table 2. Concentration of leptin – mean value and standard error of measurement (SEM).

Leptin [ng/ml]	Patients with nasopharyngeal carcinoma	Control group
Mean	23,59	40,80
SEM	3,179	5,300

Results – omentin-1

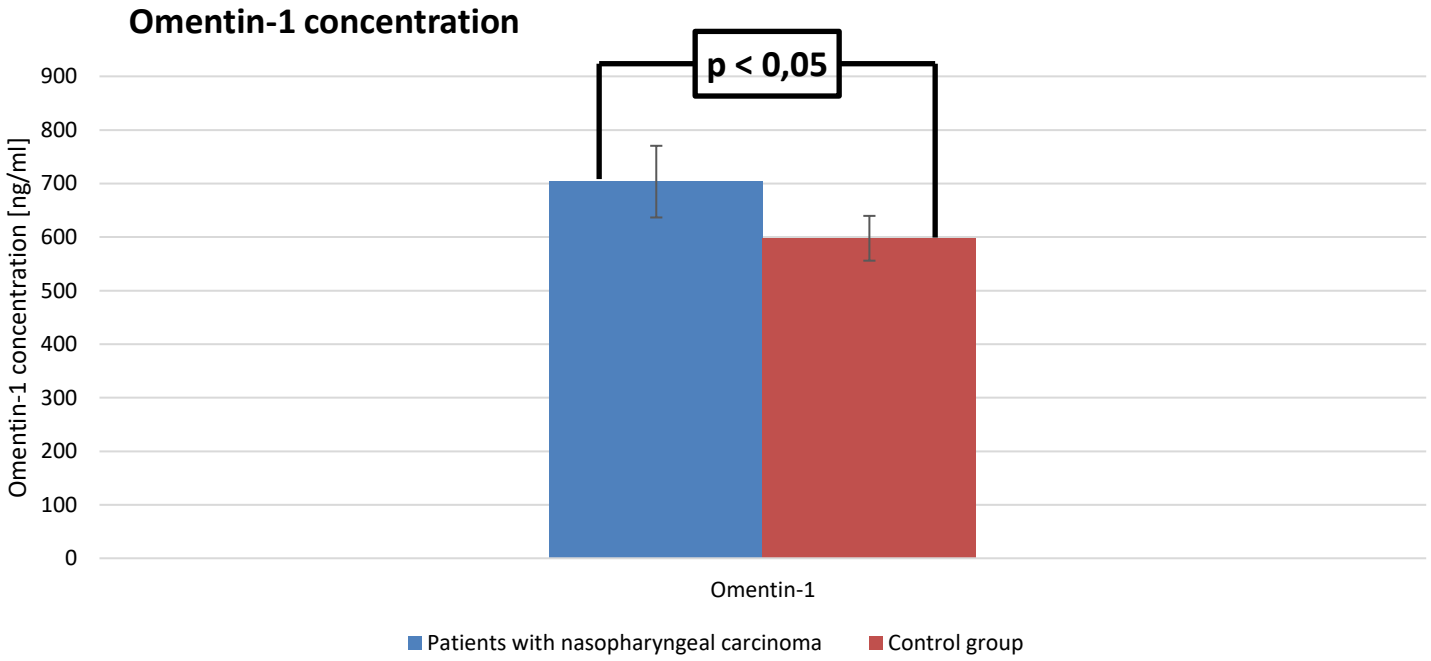


Table 3. Concentration of omentin-1 – mean value and standard error of measurement (SEM).

Omentin-1 [ng/ml]	Patients with nasopharyngeal carcinoma	Control group
Mean	703,61	597,53
SEM	67,175	41,852

Results – osteopontin

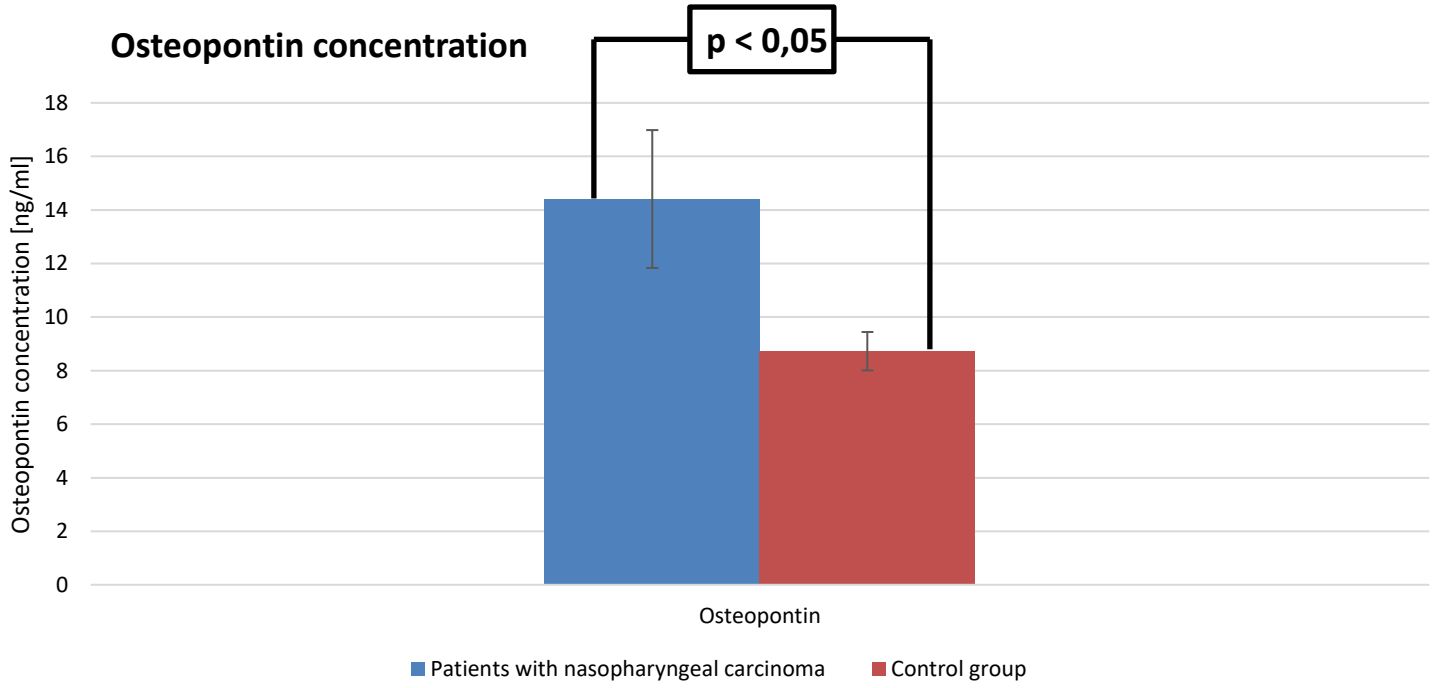


Table 4. Concentration of osteopontin – mean value and standard error of measurement (SEM).

Osteopontin [ng/ml]	Patients with nasopharyngeal carcinoma	Control group
Mean	14,41	8,73
SEM	2,578	0,717

Discussion

- So far, the concentrations of leptin and omentin-1 have not been studied in patients with nasopharyngeal carcinoma .
- Leptin concentration is strongly positively correlated with the amount of adipose tissue. Studies on other types of cancer indicate a link between leptin and the immune system and carcinogenesis. Cancer cells can also become a source of leptin. Leptin, on the other hand, activates NK cells that can neutralize cancerous cells.
- The level of omentin-1 in the course of neoplastic diseases is usually unchanged or lower compared to the healthy population.
- Osteopontin is an inflammation modulator and influences aggressiveness of cancer cells. The obtained osteopontin concentrations are consistent with the results obtained by other researchers in the course of cancer.

Conclusions

- A lower concentration of leptin in the NPC group may indicate to cachexia.
- Elevated levels of omentin-1 and osteopontin in NPC patients may point to the role for these markers in this disease.
- Further research on the role of adipokines in nasopharyngeal carcinoma may allow the evaluation of the usefulness of these analytes as prognostic and diagnostic markers.

Acknowledgments

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