Streszczenie w języku angielskim

Gastric cancer (GC) is the 5th most frequently occurred malignant neoplasms in the world and the 4th cause of death. Among polish men, GC constitutes the 6th and 5th cause of newly-diagnosed malignant neoplasm and deaths, respectively. While in polish women, GC occurs less commonly, although, it locates at the 7th place among the causes of death. Histologically, GCs are adenocarcinomas and are diagnosed at an advanced stage of development, resulting in lower chances of total recovery. Therefore, it is essential to conduct research aimed at identifying changes in the molecular and biochemical profiles specific to the early stages of GC progression. In recent years, much research has focused on adhesion proteins as targets of anti-cancer therapy. Adhesion proteins play an important role in the processes of tumor development, such as: growth, invasion, and metastasis. Due to changes in cell-cell interactions, neoplastic cells show disturbed morphology, which results in weaker adhesion properties and contributes to the gain of metastatic potential. Among adhesion proteins are tensins (TNS) with a representation of four proteins TNS1-4. These proteins form bridges between actin fibers and β-integrins, called focal adhesions, enabling them to participate in signal transmission between the intra- and extracellular space. TNS1 is an important factor in the proper cell migration and can suppress tumors by inhibiting excessive migration of tumor cells. TNS2 protein regulates PI3K/Akt signaling pathway influencing processes related to cell proliferation and migration. As a negative regulator of this signaling pathway, it acts as a tumor growth suppressor. In turn, TNS3 plays an important role in the process of cancer formation and contributes to the acquisition of the invasive capacity of cancer cells. Studies show that silencing the *TNS3* gene reduces the invasiveness of cancer cells. The biological functions associated with the expression of the TNS4 protein include processes related to cell motility, apoptosis, growth factor homeostasis, and oncogenic potential. TNS4 overexpression contributes to increased cell migration by binding the PTB domain to the β1-integrin tail, stimulating integrin-associated kinase expression, or interacting with the tumor suppressor DLC1.

This study aimed to evaluate the expression of adhesion proteins: TNS1, TNS2, TNS3, and TNS4 in GC compared to normal mucosa, and to analyze the relationship between the expression of these proteins and selected clinicopathological parameters of GC, as well as overall patient survival.

The expression of TNS1, TNS2, TNS3, and TNS4 proteins was assessed in 90 patients using an immunohistochemical method. Statistical analysis was performed using the Statistica 13 program (Statsoft, Cracow, Poland).

TNS1 protein was more often present in undifferentiated tumors as compared to poorly-differentiated and moderately-differentiated tumors ($p=0.016$). TNS1 protein expression was also frequently observed in metastatic neoplasms as compared to neoplasms without distant metastases ($p=0.001$). TNS2 protein was more often present in moderately-differentiated neoplasms than in poorly-differentiated and undifferentiated neoplasms ($p=0.041$). TNS2 expression was common in tumors with peritumor inflammation ($p=0.041$) and associated with H. pylori infection ($p=0.023$). On the other hand, TNS3 protein was more often in moderately-differentiated neoplasms than in poorly-differentiated and undifferentiated neoplasms ($p=0.023$). Higher TNS4 expression was more common in GC characterized by diameter ≥5 cm ($p=0.038$). It was also shown that an increase in TNS4 expression was present frequently in histological type neoplasms without the mucous component than in mucous neoplasms ($p=0.021$). Moreover, it was observed that higher expression of TNS4 is present in moderately-differentiated tumors as compared to poorly-differentiated and undifferentiated tumors ($p<0.001$). An increase in TNS4 expression was also seen in the intestinal type of GC according to Lauren's classification ($p=0.018$). There was no significant relationship between the expression of TNS1, TNS2, TNS3, and TNS4 proteins and the overall survival of the patients.

In conclusion, TNS1 protein expression is associated with a worse prognostic type of GC and the prevalence of distant metastases. On the other hand, higher TNS2 expression is accompanied by peritumoral infiltration of inflammatory cells and *H. pylori* infection, which favor the development of cancer with better prognosis, as is the case with higher TNS3 protein expression. TNS4 expression was significantly higher in tumors with diameter ≥5 cm, with a moderately-differentiated, without a mucous component, and intestinal type of GC. The increased level of TNS4 expression is associated with a histological type of gastric cancer with a better prognosis.