Role of tumour- associated neutrophils in tissue material and systemic neutrophil inflammation in colorectal cancer patients

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A- Conception and study design; **B -** Collection of data; **C -** Data analysis; **D -** Writing the paper;
E- Review article; **F** - Approval of the final version of the article; **G** - Other (please specify)\

ABSTRACT

Introduction: Colorectal cancer (CRC) is one of the most common malignant cancers worldwide. Immune response is appear to be inseparable component of each part of tumorigenesis. Moreover, several studies have shown that some populations of neutrophils, called tumor-associated neutrophils (TANs) can be also actively involved in the tumor growth, anggenesis and development of the distant metastases in various cancer tissues.

Purpose: To investigate the prognostic significance of TANs in the tumor tissue in correlation with absolute neutrophil count (ANC) and anatomoclinical features of colorectal cancer patients.

Materials and methods: We retrospectively analysed a tissue material of primary tumour mass and hematologic parameters from whole blood obtained form 160 patients diagnosed with CRC in correlation with anatomoclinical variables and disease-free survival time (DFS). Analysis of TANs in tissue material was performed by two independent pathologists under light microscopy blinded to patients' clinical information. ANC of whole blood samples was obtained within 3 days before and 7 days after the surgical treatment. We propose to exanimating of the local and systemic immune response based on the tumor- associated neutrophils in material tissue of in the invasive front and center of the primary tumor mass and ANC in whole blood samples obtained before and after surgery. Additionally, we added to mentioned above parameters the tumor progression status including the invasion of cancer cells to lymphatic vessels, lymph node involvement and the presence of distant metastasis.

Results: Combination of TANs and ANC in invasive front of tumour and in main mass of tumour were correlated with many anatomoclinical features linked with disease progression. Combined parameters of TANs, ANC and tumour progression status was associated with lymphatic invasion, lymph node involvement, TNM stage (p= 0.009), pT stage (p= 0.032) and Crohn's-like aggregates (p= 0.042). Results of centre tumour mass and ANC showed that patients with high TANs and high ANC (group 1) live longer than patients with high TANs and low ANC (group 2) (p= 0.038-3year DFS; p= 0.034- 5 year DFS).

Conclusion: TANs and ANC may have significant role in the tumour progression in colorectal cancer, but it may vary depending on the circumstances of their collection, including both tumour location and the time of cell collection.

Key words: Tumor-associated neutrophils, TANs, neutrophil count, whole blood samples, colorectal cancer

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DOI: 10.5604/01.3001.0015.6402