

Possible activation of neutrophiles by oncothermia

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Background: Neutrophil granulocytes are presented in blood stream in greatest strength among white blood cells in mammals, having crucial role in the immune system. Neutrophils are one of the first responders on inflammations or bacteria infections, and their role is essential in the defense mechanisms of the organism [1]. Various chemical signals activate the migration of neutrophils toward to the site of inflammation [2] and it could effect even in the cancer cases [3].

Methods: Blood samples of nude mice and of voluntary humans were studied before and after oncothermia treatment. Samples were carefully collected from tail's venue of mice and from finger capillaries from humans. The individual blood-collection was made before and after oncothermia treatment, as well as it was regularly and systemically made in cases of all the subsequent treatments. Samples were promptly (freshly) measured by dark-field microscopy and archived by high resolution video-techniques. The systemic effect of neutrophils were studied on double tumorous mice, (femoral inoculation HT29 xenograft), treating one localization and observing effect on the non-treated lesion. High-resolution digital microscopy was applied to evaluate the morphology of hematoxylin-eosin stained samples.

Results: Both in mice and human blood a definite activation (increased migration motility) is observed after oncothermia treatment compared to the situation before. The active motility was characteristic on all the treated donors, irrespective their tumors or their human or mouse origin. The untreated tumor in double-tumorous mice were drastically infiltrated by neutrophils after the oncothermia treatment, indicating the general systemic migration activity of these species. The far away effect form the actual treatment localization gives a hint of the observed abscopal effect [4] by oncothermia treatment.

Conclusions: Observations of the recent study support the hypothesis that oncothermia activates systemic immune reactions by increased motility of neutrophils. The effect is expected in distant lesions from the actually performed local treatment. Further experimental investigations of the phenomenon together with the detailed study of the abscopal effect in humans are in progress.

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