Comparative study of the curative properties of the walnut spread in Georgia by using leukopenia experimental model

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Basic life-threatening complications that develop in cancer patients after radiotherapy and/or chemotherapy and caused by decreasing of organism's immune response is still actual problem in oncology. The factors (for example colony stimulation factor) of the different nature used in the medicine to overcome the problem is expensive and besides it have certain negative side effects which is expressed in the stimulation of tumor growth.

Therefore, the study of the natural, plant origin compounds capable to immune correction, are still actual. Special interest is directed to the walnuts (Juglans regia). The medicines obtained from leaves and septum of the walnuts has anti-tumor activity. Positive therapeutic effects of extracts made from walnut septum prepared by different ways are described for a wide range of diseases. It is established that water extract from Greek walnut septum normalizes blood leukocyte formula in adult mice, after one or twice injection of cyclophosphamide which is achieved by stimulation of differentiation of myeloid line in bone marrow and the division of blast cells. Considering that other species of the walnut (American walnut- Pecan- Carya pecan) can be found in Georgia it was interesting to determine if it has similar curative properties.

Aims: comparative study of the curative properties of various walnuts by using experimental model of leukopenia.

Materials and methods: Greek (Juglans regia) and American walnuts (Carya pecan) septum were used for research materials. For estimation of curative properties of walnut septum water extract following methods were used: 1. Determination of leukocytes total amount in the peripheral blood of white mouse; 2. Estimation of cell redistribution according to cell cycle phases by propidium iodide staining method; 3. Chromosomal analysis of mouse bone marrow; 4. Estimation of behavioral parameters changes; 5. Study of sustainability and sorption ability of red blood cells membrane; 6. Determination of catalase activity and the amount of nitric oxide.

Results and discussion: The extracts from American and Greek walnuts septum at the 4th and 8th day after injection of cyclophosphamide showed normalization of cytogenetic indicators, using experimental model of leukopenia. In addition, the effect is more significant at the 8th day after injection. American walnut septum extract had especially high effectiveness in this case. Normalization of the blood leukocyte formula of adult mice by the walnut septum extract mentioned above, was established. Both walnuts extract causes normalization of the enzyme catalase activity and changes of nitric oxide amount. Increasing the sorption ability of red blood cells, correction of disorder motor activity and some parameters of the learning caused by cyclophosphamide, are

revealed by influence of Greek walnut septum. The positive effect of American walnut on the mentioned parameters is expressed relatively slightly.

Conclusion: Water extracts of Greek (Juglans regia) and American walnut (Carya pecan) septum have ability to normalize biochemical, genetical, physiological and morphological parameters disordered in response to injection of Cyclophosphamide in adult white mice. Positive effects which were not received in case of American walnut on certain physiological and molecular parameters can be explained by different percentage of content of some components in the walnut septum.