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TREHALOSE ENHANCES THE ANTITUMOR POTENTIAL OF METHOTREXATE AGAINST MICE BEARING EHRLICH ASCITES CARCINOMA

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Methotrexate (MTX) is commonly used as a standard chemotherapy for many cancers, however its usage required high doses thereby leading to severe adverse effects. In a trial to find a suitable neoadjuvant therapy to decrease MTX dosage without lowering its chemotherapeutic efficacy, we investigated the antitumor effect of trehalose (TRE) on mice bearing Ehrlich ascites carcinoma (EAC) and checked whether TRE can enhance the antitumor potential of MTX. Treatment with TRE induced anti-tumor effects against EAC as revealed by a remarkable decrease in body weight, tumor volume and count of viable tumor cells, expression of the anti-apoptotic gene Bcl2 as well as by a significant increase in mean survival time, life span and expression of the apoptotic gene caspase-3. TRE also caused a significant decrease in autophagic activity of EAC cells as evident by reduction in the expression of the autophagic gene Beclin 1 (Bec1) and the fluorescence intensity of autophagosome marker. Additionally, TRE restored the altered hematological and biochemical parameters and improved the disrupted hepatic tissues of EAC-bearing mice. Interestingly, co-administration of TRE and MTX showed highest anti-tumor effect against EAC. These data indicate that TRE enhances the antitumor potential of MTX and could be used as neoadjuvant drug to increase the efficacy of the antitumor drug, MTX.

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