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Effects of aqueous garlic extract on oxidant/antioxidant status in 32D and 32Dp210 cell lines

Aslıhan AVCI¹, Asuman SUNGUROĞLU², İmge B. ERGÜDER¹, Güvem GÜMÜŞ AKAY², Erdinç DEVRİM¹, Pınar ÖZKAL BAYDIN², Nuray VAROL², İlker DURAK¹

¹Department of Biochemistry, Faculty of Medicine, Ankara University, Ankara - TURKEY

²Department of Medical Biology, Faculty of Medicine, Ankara University, Ankara - TURKEY

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 [Authors](#)



medsci@tubitak.gov.tr

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Abstract: To investigate the possible effects of aqueous garlic extract on the oxidant/antioxidant status and apoptosis in 32D (wild type mouse myeloid cell = normal) and 32Dp210 (BCR-ABL fusion gene (+) mouse myeloid cell = Chronic Myelocytic Leukemia cells) cell lines. Materials and methods: Aqueous garlic extract (10% w/v) was added into the cell line media with 2 different final concentrations (0.4% and 1%). At 0 h and at 24, 48, and 72 h later, the oxidant (malondialdehyde (MDA) level, and xanthine oxidase (XO) enzyme activity) and antioxidant (superoxide dismutase (SOD), glutathione peroxidase (GSH-Px), and catalase (CAT) enzyme activities) parameters were measured in the cell lines. Results: It was observed that the garlic extract caused no change in the XO and antioxidant enzyme activities, but it increased the MDA level in the 32D cell line. However, significant increases were found in the MDA level, XO, and antioxidant enzyme activities in the 32Dp210 cell line treated by the garlic extract. Additionally, it was shown that garlic extract had antiproliferative and apoptotic effects on both cell lines. The most effective apoptotic dose was found to be 0.4% (w/v), and at this concentration the death risk of the 32Dp210 cell line was calculated at 2.08 times higher than that of the 32D cell line. Conclusion: It has been suggested that garlic directly causes oxidant stress in the 32D cell line owing to its own oxidant ingredients, and that the oxidant stress created by garlic in the 32Dp210 cell line might occur through increased XO activity and/or its oxidant ingredients. Additionally, antioxidant enzyme activities were found to increase in the 32Dp210 cell line; it would seem that this compensatory change could not prevent the oxidant stress created. We think that the oxidant potential of garlic extract might play a part in its possible anticancer potential, previously supposed by several investigators.

Key words: Garlic, mouse myeloid cell line, oxidant/antioxidant status

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