

Mitomycin C-Activity Effected by Vitamins B1, C, E and β -Carotene under Irradiation with γ -Rays

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Vitamin B1 (thiamine) can essentially effect the activity of mitomycin C (MMC), added individually or in combination with antioxidant vitamins (C, E-acetate, β -carotene) as found in experiments *in vitro* (Escherichia coli bacteria, AB 1157) under irradiation with γ -rays. The environment plays a crucial role. In *airfree media* vitamin B1 leads to a 2-fold increase of the MMC-efficiency, but adding vitamin C it decreases. In the presence of all vitamins (B1, C, E-ac., and β -carotene) the MMC-action increases about 1.8-fold. In *aerated media* vitamin B1 causes an about 4-times increase of the MMC-efficiency, but by adding vitamin B1 and C the MMC-activity decreases by a factor of two, whereas in the presence of B1, C, E-ac., and β -carotene it rises again to 2.6-fold. In environment *saturated with N_2O* (conversion of e^-_{aq} into OH radicals) a different picture is observed. The presence of vitamin B1 or vitamin B1 + C causes a strong decrease of the MMC-efficiency, but the addition of all vitamins (B1, C, E-ac., and β -car.) leads to a small increase of the cytostatic action. The results demonstrate the influence of vitamin B1 used individually or in combination with other antioxidants on the MMC-efficiency and the strong effect of the environment. The results are of interest for the application of MMC in radiotherapy.

Key words: Mitomycin C, Vitamins B1, C, E and β -Carotene