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Disulfiram with metformin inhibit hamster fibrosarcoma growth

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We investigated the anticancer effect of disulfiram and metformin combination on fibrosarcoma in hamsters. Syrian golden hamsters of both sexes (~70 g) were randomly allocated to control and experimental groups (8 animals per group). In all groups, 2×10^6 BHK-21/C13 cells in 1 ml were injected subcutaneously into the animals' backs. Peroral treatments were carried out with disulfiram 50 mg/kg daily, or with metformin 500 mg/kg daily, or with their combination. Validation grups were treated by double doses of the single therapy, via a gastric probe after tumor inoculation. In the course of experiment, changes in tumor growth of each animal were recorded daily. To obtain volume estimates, we used calipers to measure the tumor diameters.The animals were sacrificed 19 days post inoculation. Blood samples were collected for hematological and biochemical analyses, and the main organs were toxicologically tested. The tumors were excised and weighed, and their diameters and volumes were measured. The tumor samples were pathohistologically and immunohistochemically assessed (Ki-67, PCNA, CD34, CD31, COX4, Cytochrome C, GLUT1, iNOS). The combination of disulfiram and metformin significantly inhibited fibrosarcoma growth in hamsters without toxicity, compared to monotherapy or control. The single treatments did not show significant antisarcoma effect. Administration of disulfiram with metformin might be an effective and safe approach in novel nontoxic adjuvant anticancer treatment and relapse prevention antitumor therapy.

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