PLAG alleviates cisplatin-induced cachexia in lung cancer implanted mice

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Chemotherapy-induced cachexia has been a significant challenge to the successful treatment of cancer patients. Chemotherapy leads to loss of muscle, loss of appetite, and excessive weight loss, which makes these necessary treatments intolerable for most patients. Therefore, it is necessary to alleviate cachexia to successfully treat cancer patients. In this study, tumor-implanted mouse models administered cisplatin showed rapid weight loss and reduced feeding rate by the second week of treatment, and 1-palmitoyl-2-linoleoyl-3-acetyl-rac-glycerol (PLAG) effectively alleviated cisplatin-induced cachexia. In mice treated with cisplatin on a sacrificial day after 6 weeks, the weight of the two major leg muscles (quadriceps femoris and gastrocnemius) were reduced by up to 70%, but this muscle reduction was successfully prevented in the PLAG co-treatment group. The distribution and size of muscle fibers that appear in small units in cisplatin-treated mice were restored to normal levels by PLAG co-treatment. Furthermore, myostatin expression levels were upregulated by cisplatin, whereas myostatin decreased to normal levels with muscle recovery in the PLAG co-treated group. Tumor necrosis factor alpha (TNF-α) and interleukin-6 (IL-6), which are commonly expressed in cachexia, were significantly increased in cisplatin-treated mice but were reduced to normal levels in PLAG co-treated mice. Glucose absorption, an indicator of muscle tissue activity, decreased with cisplatin treatment and recovered to normal levels with PLAG co-treatment. Overall, PLAG effectively alleviated cisplatin-induced cachexia symptoms and reduced tumor growth in tumor-implanted mice. These findings suggest PLAG may be a promising drug to alleviate cachexia in cancer patients receiving chemotherapy.

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