THE EFFECT OF MGN-3 ON CISPLATIN AND ADRIAMYCIN INDUCED TOXICITY IN THE RAT.

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MGN3 (BioBranTM) is derived from rice bran and is produced by the partial hydrolysis of the water soluble hemicellulose fraction of rice bran by carbohydrases derived from Lentius edodes mycelia [US Pat. 5560914]. MGN3 has been shown to be a biological response modifier producing an increase in natural killer cell activity in immunocompromised patients [Int. J. Immunother. 14(1)1998].

Aim

To prevent gross pathological changes and weight loss produced by a single dose of cisplatin(CIS) or adriamycin(ADR) by daily oral dosing of 5 or 50 mg/kg MGN3.

Method

Following an acclimation period of 13 days, male Sprague-Dawley rats were selected for test based on body weights and assigned (10 rats/gr) to each of the following: (doses stated as mg/kg)

1)MGN3 5mg PO+Veh IP
2)MGN3 50mg PO+Veh IP
3)MGN3 Control PO+CIS 9mg IP
4)MGN-3 5mg PO+CIS 9mg IP
5)MGN3 50mg PO+CIS 9mg IP
6)MGN3 Control PO+ADR 10mg IP
7)MGN3 5mg PO+ADR 10mg IP
8)MGN3 50mg PO+ADR 10mg IP

Rats received oral (PO) MGN3(susp.in dist.water) or vehicle(veh) daily for 11 days. The chemotherapeutic agents or veh were administered to each rat by a single IP injection on Day 3. Rats were observed for clinical signs daily for 11 days. Body weights were recorded every other day. On Day 11, all animals were euthanized by CO2 inhalation and necropsied. Gross appearance of major organs was evaluated and the presence of gastrointestinal damage noted.

Results

Three rats from Gr 3, 4 from Gr 5, and 1 from Gr 4 died between D 7 and 11. Rats receiving MGN3 at 5 or 50 mg/kg PO showed a stat. sig. increase in body weight(+72%). Rats receiving CIS or ADR alone showed a smaller increase or decrease in body weight(-1.5%,CIS;+30%,ADR). Rats receiving MGN3 at 5 or 50 mg plus CIS or ADR had a sig. greater weight gain than that observed with the chemotherapeutic agent alone (MGN3 5mg in CIS treated rats, +11% and +46% in ADR treated rats). MGN3 50mg in CIS treated rats, +44% and +43% in ADR treated rats. MGN3 when administered at 50mg/kg PO prevented death induced by CIS. Surviving rats receiving MGN3 appeared healthier, gained weight and had a lower incidence of gross intestinal pathology.

Conclusions

MGN-3 was effective at maintaining body weight after a toxic dose of either CIS or ADR and protected against some of the gross gastrointestinal pathological changes. MGN3, which has been previously shown to increase NK cells and have potential in several disease states, may also be valuable in improving "quality of life" in patients receiving chemotherapy.

(MGN3 was supplied by Daiwa Pharmaceutical Co.LTD, Tokyo)