THE ROLE OF HAELAN 851® NUTRITION IN ENHANCING THE ANTI-CANCER EFFECT OF CHEMOTHERAPEUTIC DRUGS IN MICE WITH HAC CELL LIVER CANCER

INTRODUCTION

Ascitic type liver cancer HAC is a high malignancy, rapid growing strain of liver cancer. The survival period of HAC liver cancer tumor carrying mice ranges from 9 to 12 days in general. The longest survival period of the control specimens in this study was 11.5 days. Intraperitoneal injection of cyclophosphamide at 50mg/kg three times may prolong the average survival period 2.44 days. The increased life span (ILS, %) is 22.86%, and is considered to be the effective medication dose. With these same conditions, Haelan 851, Platinum Formula, oral nutritional beverage was given to the mice for one week before and eight days after the inoculation of the liver cancer HAC cells.

Eight days after the mice were inoculated with the liver cancer HAC cells, the chemotherapy treatments with cyclophosphamide and the nutritional supplementation with Haelan 851, Platinum Formula, oral nutritional beverage was discontinued. On the 9th day the normal diet existing before the experiment was given the mice. The average survival period and increased life span (ILS) of the mice were calculated and are shown in Table II.

$$\text{Increased Life Span (ILS)} = \frac{\text{Survival period of the treatment group} - \text{survival period of the control group}}{\text{Survival period of the control group}} \times 100$$

METHODS AND MATERIALS

Forty Kunming breed mice with a body weight ranging between 20 to 25 grams were divided at random into eight groups of five mice each. On the 8th day of the experiment, all of the mice were injected intraperitoneally with HAC suspension of 0.2 ml/ampoule(10^7/mm^3) under aseptic manipulation. The body weight and survival period of the mice were observed and recorded after the first and the sixth day of the inoculation of the HAC strain cancer cells to measure the increased life span (ILS, %) of the mice in different groups.

The control group was given water only and all other mice were given cyclophosphamide. Three of the groups were nutritionally supplemented with Haelan 851, Platinum Formula, oral liquid nutritional beverage for 7 days prior and eight days after inoculation with the HAC strain cancer cells . Details are shown in Table I.

Table I
Condition of Inoculation of HAC Liver Cancer Cells, Injections with Cyclophosphamide*, and Degree of Nutritional Supplementation With Haelan 851, Platinum Formula, Oral Liquid Beverage

Group	HAC Cancer Cell Inoculation	Nutritional Support Level Before and After Consecutive 7 Days Before	Consecutive 8 Days After Inoculation
1	No	Water Given	Water given
2	Yes	36% Haelan Platinum Formula	36% Haelan 851 given plus injection of cyclophosphamide -50 mg/kg x 3 * ip.
3	Yes	60% Haelan Platinum Formula	60% Haelan 851 given plus injection of cyclophosphamide -50 mg/kg x 3* ip.
4	Yes	100% Haelan Platinum Formula	100% Haelan 851 given plus injection of cyclophosphamide -50 mg/kg x 3 * ip.
5	Yes	Water Given	Water given plus and injection of cyclophosphamide - 50 mg/kg x 3*ip.

Note: Cyclophosphamide is an alkylating chemotherapy agent that is prescribed in the treatment of a variety of neoplasms and as an immunosuppressant in organ transplants. Among the more serious adverse reactions are anorexia, vomiting, alopecia, , leukopenia, and potentially serious hemorragic cystitis.

Table II

Enhancing Effect of Haelan 851, Platinum Formula, Nutritional Supplementation on Chemotherapy (Cyclophosphamide) Treated HAC Liver Cancer Carrying Mice

		Survival Period - Condition of ILS				
Group	No. Mice	X+ SD, Days	No. of mice >17 days	Increased Days	ILS%	P Value***
1	8	10.63 ± 1.03	0	----------	------	---
2	8	12.38 ± 2.37	1	1.75 + 2.05	16.46	0.1
3	8	14.44 ± 3.54	2	3.94 + 2.87	35.04	0.02
4	8	16.56 ± 3.56	6**	94 + 2.96*	55.75	0.01
5	8	13.06 ± 3.03	1	2.44 + 2.58	22.86	0.05

* In comparison with the 5th group $P<0.05$
** In comparison with the 5th group $P<0.01$
*** In comparison with the 1st group.

SUMMARY

The results of this study suggests that nutritional supplementation with Haelan 851, Platinum Formula, oral nutritional beverage, on a daily basis, for a period of one week before and eight days after the inoculation in mice with HAC liver cancer cells produced the following results:

The number of mice which gained a 60% (>17 days) increase in the survival period in the undiluted nutritionally supported group increased from one mouse (12.5%) in the group given cyclophosphamide alone, to six mice (75%). The difference is of very marked significance. **The increased life span (ILS) rates of the groups given the 60% concentrated dose and 100% concentrated dose of Haelan 851, Platinum Formula, nutritional beverage increased from 22.86% to 35.04% to 55.75% respectively, and also increased the increased life span (ILS) rates in the cyclophosphamide group from the original 22.86% to 56.78% and 143% respectively. The difference is of marked significance.**

In addition, the second findings in this study is that Haelan 851, Platinum Formula, oral nutritional beverage is effective in supporting impairment of the liver induced by thioacetamide (TAA) and in resisting lipid oxidation. This suggest that the Haelan 851, Platinum Formula, oral nutritional beverage is appropriate to be used as an adjuvant nutritional supplement for those cancer patients with tumors, especially liver cancer. According to the D. Harvey, et al, Aldrich 1988-1989, p 1425, Aldrich Chemical Co., Inc., thioacetamide (TAA) is a toxic substance of the liver, which is also one of the carcinogenic factors. The relationship between liped peroxide (LPO) levels in the liver and tumors is common knowledge.