

Effect of Specific Transfer Factor on Rates of Lymphocyte Transformation and Indexes of Leukocyte Adherence Inhibition in Patients with Ovary Carcinoma

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Abstract **Objective** To investigate the activity in vivo of specific transfer factor (STF) to patients who were treated by means of chemotherapy for ovary carcinoma. **Methods** Immunotherapy of goat original STF was used to the chemotherapeutic patients with ovary carcinoma. Rates of lymphocyte transformation (LT) and indexes of leukocyte adherence inhibition (LAI) were detected and compared with that of control patients. **Results** LT rates in 34.1% of the patients in experiment group were found having been risen up. After treatment, their LT values were significantly higher than that of the controls ($p < 0.01$). The LAI indexes of the experiment patients after treatment were significantly higher than that of the controls ($p < 0.05$). **Conclusion** Goat original STF was able to promoted in vivo the rates of LT and indexes of LAI in the chemotherapeutic patients with ovary carcinoma.

Key words ovary carcinoma; specific transfer factor (SPF); lymphocyte transformation (LT); leukocyte adherence inhibition (LAI)

Transfer factor, especially special transfer factor (STF), was surely beneficial to cancer patients, and would show certain effects if it was used in the treatment of cancer patients [1,2]. To further investigate such a clinical effect and the mechanism of the effect, STF was used to treat patients with ovary carcinoma, and the rates of lymphocyte transformation (LT) and indexes of leukocyte adherence inhibition (LAI) were detected and compared with that of the control patients who were not given the STF to treat.

METHODS AND MATERIALS

Subjects and samples 23 cases with ovary carcinoma, admitted to our Cancer Hospital within the period from 1997 to 1999, were all registered to this project. all cases were pathologically diagnosed after surgical operations. All the 23 patients were randomly divided into experimental or control groups, treated by routine chemotherapy, accompanying with (for experiment group) or without (for controls) STF treatment, respectively. Blood samples from all the 23 cases were drawn before and after treatment.

Chemotherapeutic drugs and STF Chemotherapeutic drugs used to all the 20 patients in this project included: cis-platin, carboplatin, doxorubicin, cyclophosphamidum, VP-16, and

so on. Goat original STF, which would be used to the cases in experiment group, was prepared in the Dept of Immunology, Cancer Institute of Guangxi^[3].

Experimental methods LT assay was performed according to the method of whole blood micro-culture^[4]. Heparin anti-coagulated. The cultural medium was composed of 1640 solution, with calf-serum (10%) and PHA (50u/ml) in it. After incubating in 37C for 72 hours, the incubated samples were centrifugally treated, then, blood-cell smears were made and dyed as Wright-Giemsa's method. 100 of the lymphocytes in every one of the dyed smears were microscopically observed and the LT rate was calculated obeying the formula showed as bellow:

$$\text{LT rate} = \frac{\text{Number of transformed and semi-transformed cells}}{\text{Number of all the lymphocytes observed}}$$

LAI assay was performed as MTT method^[5]. Leukocytes were separated from the whole blood samples and the concentration of leukocyte cells was regulated to about $2 \times 10^6/\text{ml}$, then added to the incubate-flats for everyone of the subjects in both experiment and control groups. Solution of antigen from splitting cancer-cell was added to the flats of experiment cases. All the flats were incubated in 37C for 72 hours. Then, the upper

part of the clear fluid was abandoned and the solution of 1640 with MTT was added to the flats, which were then put into 37°C incubation again for 3 hours, and, the upper part of clear fluid was abandoned again. Then, DMSO solution was added into and O.D. value in 490nm was detected. Indexes of LAI were calculated obeying the formula showed as below:

$$\text{LAI Index(\%)} = \frac{\text{O.D. of control} - \text{O.D. of experiment}}{\text{O.D. of control}}$$

Grouping There were 17 cases (32 cases-times in total) divided into experimental group. Ages of the cases in experiment group ranged from 21 to 68, meaning at 45 of years. Pathological diagnosis of the cases in this group: 12 cases with serous cystadenocarcinoma, within them, 10 were in III stage, 1 in II stage and 1 in I stage; 1 of the cases with mucinous cystadenocarcinoma in III stage; 4 cases with poorly differentiated adenocarcinoma in III stage. Control group included 6 cases with serous cystadenocarcinoma, 3 in III stage and 3 in I stage.

Clinical treatment All the cases, no matter in experiment or control groups, were treated by the method of combined chemotherapy after operations of tumor section. According to the result of cancer-cell sensitive tests, 2 to 3 kinds of chemotherapeutic drugs were chosen for every one of the cases. Goat original STF's were prescribed to cases in experiment group, 4u per two days, hypodermic injection, 1 month as a course. When the patients were permitted to leave, or when they came back the hospital again from their home for further treatment, a same course treatment of STF would be given.

Statistic method The cases in experiment group were subdivided into risen up, reduced down or remained stable subgroups (UPER, LOWER or STABLE, in short, respectively). Comparing the value before and after treatment.

STABLE subgroup. The others would be then subdivided into UPER or LOWER subgroups, respectively. Method of t test was used to statistical procedure when the comparing was performed between experiment group and control group.

RESULTS

LT rates After treatment with STF, LT rates were significantly risen up in 34.4% ($p < 0.01$), remained stable in 46.9%, significantly reduced down in 18.8% ($p < 0.05$) of the cases in experiment group. LT rates were significantly higher in cases of the "risen up" group than that in cases of control group (Table 1).

LAI indexes After treatment with STF LAI rates were significantly risen up in 56.7% ($p < 0.01$), remained stable in 6.7%, significantly reduced down in 36.7% ($p < 0.05$) of the cases in experiment group. LAI indexes were significantly reduced down in all the cases of control group ($p < 0.05$) after chemotherapy treatment. LAI indexes were significantly higher in all the cases in experiment group, especially in cases in the "risen up" group, comparing that in the controls (table 2).

DISCUSSION

LT rates and LAI indexes, were the important indexes which often be used to investigate the mechanism of STF to increase the special immunity. Most of the research reports considered that STF could raise up LT, but a few regarded it as negative^[6]. Perhaps, different conclusions came from different dosages and different activity of the STF. Different methods of grouping and statistics might also be relevant in some way.

Our study confirmed that when goat original STF was used to the cases who were having chemotherapy to cure ovary cancer, LT rates were risen up in 34.4%, remain stable in 46.9%, LT rates were found to be lower down in only 18.8% of these cases. Even so, the LT rates of the cases were lower down after treatment, the values of LT rates were still not lower than that in the controls. Comparing the values obtained before

which the values of LT rates had already been risen up to rather high level by the STF treatment, so that the immunity of the cases became relatively sensitive to chemo-drugs and led to LT lower down for some degree.

Comparing the LAI indexes in controls before and after treatment, lower down values were significantly seen, suggesting that a significantly inhibit effect of the chemotherapy drugs on LAI indexes would exist. LAI indexes significantly risen up in 56.7% in experiment group, so that it became significantly higher than that of the controls. Like the LT rates, lower LAI indexes were found in some of the experiment cases (those in "lower down subgroup"). For all that the LAI indexes were still higher than that of controls. All those cases had already had rather high values of LAI indexes before STF treatment. It was suggested that cases who had had higher LAI

indexes before treatment would be more sensitive to the immu-inhibit effect of chemotherapy drugs. It was also suggested that the immu-increase effect of STF would be more significant in cases having relative lower LAI rates before treatment.

Like reported by Ji Yanyan et al, responses of the experiment members to STF treatment were significantly different each others^[7]. A few of our experiment cases had very low LT or LAI values before treatment. Their LT or LAI values were not significantly risen up after STF treatment. It might be suggested that the effect of STF used in vivo was relevant with the different degree of immu-inhibition of the patients.

Table 1 The effect of STF on LT Rates ($\bar{X} \pm S$)

	Control group	Experiment group			
		Total	Upper	Stable	Lower
Before	54.3 ± 5.4	57.7 ± 9.3	51.9 ± 8.7 ¹⁾	58.3 ± 7.4	66.7 ± 7.0 ⁵⁾
After	55.2 ± 2.61 ¹⁾	60 ± 8.02 ²⁾	64.5 ± 6.2 ³⁾	58.7 ± 8.2	55.0 ± 6.6 ⁶⁾
n(%)	6/6(100)	32/32(100)	11/32(34.4)	15/32(46.9)	6/32(18.8)

Notes: 1) VS 2) P>0.05; 1) VS 4) P<0.01; 3) vs 4) p<0.01; 5)VS 6) p<0.05

Table 2 The effect of STF on LAI Indexes ($\bar{X} \pm S$)

	Control group	Experiment group			
		Total	Upper	Stable	Lower
Before	26 ± 11.9 ¹⁾	23.4 ± 19.5	17 ± 11.7 ²⁾	18.9 ± 8.6	34.2 ± 25 ⁶⁾
After	10.3 ± 7.8 ²⁾	29 ± 18.9 ²⁾	36.9 ± 19.1 ⁴⁾	18.5 ± 6.7	18.5 ± 13.6 ⁷⁾
n(%)	6/6(100)	30/30(100)	17/30(56.7)	2/30(6.7)	11/30(36.7)

Notes: 1) VS 2) P>0.05; 2) VS 3) P<0.01; 4) VS 4) P<0.01; 2) VS 5) P<0.01; 6) VS 7) P>0.05

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