

Experimental Study on the Antisenescent effect of Rosa Roxburghii Tratt Juice

Zheng Zimin Jin Ling

Central Laboratory, Youjiang Medical College for National Minorities, Guangxi

Abstracts:

An experimental model of subacute senility induced by d-galactose was established in guinea pigs according to Xu's method. The animals, 32 in number, were divided into 4 groups: [1] Control Group; [2] Subacute Senility Model Group; [3] Ginseng-giving Group; [4] ROSA ROXBURGHII TRATT-giving Group. The Rosa Roxburghii Tratt group received orally diluted solution of ROSA ROXBURGHII TRATT juice, the ginseng group received orally extract of ginseng. The administration of ROSA ROXBURGHII TRATT juice and ginseng extract lasted for 32 days. At the end of the experiment, examination of lipofuscin (a disuse pigment) in animal heart, liver and brain was performed with modern pharmacological technique. Blood sugar, blood picture, electrocardiogram, weight of immune organs and artificial cataract formation were examined. The results indicated that lipofuscin in heart, liver and brain tissue in ROSA ROXBURGHII TRATT and ginseng groups were markedly reduced ($P < 0.01$). Hb, red blood cells and neutrophils in blood were increased; lymphocytes were reduced in comparison with senility model group. It further proved that ROSA ROXBURGHII TRATT has antisenescent impact.

Key Words: Rosa roxburghii Tratt, Antisenescent, Lipofuscin.

ROSA ROXBURGHII TRATT is produced in Sichuan, Yunnan, Guizhou and Guangxi Provinces and widely used in folk remedy. We used guinea pig as subacute senility model on which the anti-senescent effect of ROSA ROXBURGHII TRATT juice was studied.

Experimental materials

1. **Materials:** ROSA ROXBURGHII TRATT juice (provided by Leye Food Factory, Leye County, Guangxi Province), ginseng extracts liquid, d-galactose.
2. **Animals:** 32 guinea pigs, weighed 350 ± 50 g, male or female.

Methods and Results

1. Methods:

Subacute senility model was induced by d-galactose according to Xu's method (1) animals were divided into 4 groups: [1] normal control group; [2] subacute senility group, animals were orally given normal saline (0.4ml/100g body weight); [3] ginseng-giving-group animals were given ginseng extract liquid (0.4ml/100 body weight); [4] ROSA ROXBURGHII TRATT-giving group, animals were given ROSA ROXBURGHII TRATT juice (0.4 ml/100g body weight). Group 2,3,4 were injected d-galactose (1.2 mg/100g body weight), lasting 32 days.

2. Results:

- a. **Body Weight and Immune Organ Weight:** Animals were weighed per 5 days. At the end of the study, the body weight of 4 groups increased 20.6%; 9.8%; 9.7% and 28.8% respectively. The spleen and thymus weight of 4 groups were similar (Table 1)

TABLE 1 The body weight and Immune Organ weight of 4 groups (M±SD)				
Group	Body Weight (g)		Spleen Weight	Thymus Weight
	Before Treatment	After treatment	(g/100g body weight)	(g/100g body weight)
Normal Control Group (n=5)	328.6 ± 58.3	396.2 ± 73.3 (20.6%)	0.15 ± 0.05	0.07 ± 0.05
Senility Model Group (n=6)	362.3 ± 55.5	397.9 ± 80.1 (9.8%)	0.13 ± 0.02	0.03 ± 0.001
Ginseng-giving Group (n=6)	331.5 ± 34.8	364.7 ± 66.8 (9.7%)	0.14 ± 0.07	0.04 ± 0.02
ROSA ROXBURGHII TRATT-giving Group (n=6)	363.1 ± 44.1	467.6 ± 43,4 (28.8%)*	0.13 ± 0.01	0.03 ± 0.008

* Compared with senility model group, P<0.01

- b. **Blood Picture and Blood sugar:** The composition of RBC, WBC, Hb and neutrophil in senility model group was less than the other three groups, while lymphocyte count was higher than the other three groups. Blood sugar in senility model group was higher than other groups (Table 2)

TABLE 2 The effect on the blood picture and blood sugar (M±SD)						
Group	Hb (g/L)	RBC (x 1012/L)	WBC (x 109/L)	Classification of Neutrophil	WBC % Lymphocyte	Blood Sugar (mmol/L)
Group 1	129 ± 6.7	4.76 ± 0.21	3.57 ± 0.92	24.4 ± 2.97	3.6 ± 3.5	9.8 ± 2.1
Group 2	123 ± 14.2	4.62 ± 0.53	3.30 ± 0.73	17.3 ± 7.3	79.67 ± 7.1	10.6 ± 1.1
Group 3	136 ± 13.4	4.98 ± 0.48	6.16 ± 1.44++	44.5 ± 8.6***##	52.6 ± 3.5	9.2 ± 2.0
Group 4	136 ± 11.7	4.99 ± 0.43	5.67 ± 0.66**	28.8 ± 4.7**	68.7 ± 4.97	9.5 ± 1.2

** Compared with senility model group, P<0.001
 ++ Compared with senility model group P<0.002
 ## Compared with normal control group, P<0.001

- c. **lipofuscin Content in heart, liver and brain:** pofuscin in heart, liver and brain was determined according to Sohal's method (2) the results showed that lipofuscin content in those organs of senility model group was significantly increased, while ginseng and ROSA ROXBURGHII TRATT-giving group showed an eliminating effect in those organ (Table 3).
- d. **SGPT:** SGPT content in serum was determined. The result showed that SGPT content in Group 2, 3 4 was relatively higher which we cannot explain yet (Table 3).
- e. **Electrocardiogram:** Electrocardiogram in animals was examined before execution, we found that electrocardiogram of senility group appeared abnormal,while electrocardiogram of ginseng and ROSA ROXBURGHII TRATT-giving group recovered to normal status (Table 3).

TABLE 3
 The effect on lipofuscin, SGPT and electrocardiogram (M±SD)

Group	Lipofuscin (u/g)			SGPT (u)	Electrocardiogram
	Heart	Liver	Brain		
Group 1	26.86 ± 11.82**	28.92 ± 7.49**	19.76 ± 9.11	180 ± 58.0	Normal
Group 2	42.45 ± 11.95	53.17 ± 16.8	23.15 ± 12.86	215 ± 111	Abnormal
Group 3	20.69 ± 4.89**	29.21 ± 10.5**	18.99 ± 5.6*	279 ± 54.2	Recovered
Group 4	24.55 ± 4.67 **	27.83 ± 6.9**	13.69 ± 2.99 **	255 ± 53,5	Recovered

** Compared with senility model group. P<0.01
 * Compared with senility model group, P<0.05

- f. **Artificial cataract formation:** Cataract was not found in normal control group, but was found in senility group, while cataract formation was less serious in ginseng and ROSA ROXBURGHII TRATT group than in senility group.

3. DISCUSSION

Senility is the result of retrograde metabolism in the body. According to Xu's thesis(1), artificial cataract formation, abnormal metabolism of carbohydrate can be found in senility model induced by d-galactose. We can also find the increasing levels of lipofuscin, blood sugar, lipid and the decreasing levels of hemoglobin, RBC, WBC in senility model that proved that the senility model induced by d-galactose can represent natural senility.

In our study, we found that ROSA ROXBURGHII TRATT and ginseng can prevent animals from senility effectively. Our result indicated that lipofuscin in heart, liver and brain in ROSA ROXBURGHII TRATT and ginseng groups were significantly reduced (P<0.01), Hb, RBC, neutrophils were increased and lymphocytes were reduced, in comparison with senility group.

The antisenescence effect of ginseng was confirmed by a lot of studies, we found similar effect of ROSA ROXBURGHII TRATT juice in our study. So our study proved that ROSA ROXBURGHII TRATT juice has antisenescence effect.

References:

1. Xu Baben et al: The study on subacute senility model and artificial cataract formation induced by d-galactose. Collection of theses on antisenescence drugs (1983; 2:17)
2. Sohal et al: Effect of experimental prolongation of lifespan on lipofuscin content and lysosomal enzyme activity in the brain of the housefly. J. Gerontology 1979; 34(4):489