THE ANTI-SENILITY EFFECT OF ROSA ROXBURGHII TRATT JUICE WITH SUPER OXIDATIVE DISMUTASE

The Rosa Roxhurghii tratt from Guizhou is a wild plant, which contains super oxidative dismutase (SOD). SOD is a scavenger of super oxidative anion-free radical, which is related to anti-senility effect. We surveyed old people whose age was 50-93.

Materials and Methods

1. ***Making Rosa Roxburghii tratt juice:*** Clearing rosa roxburghii tratt, extracting SOD from rosa roxburghii tratt by biochemical method. Processing rosa roxburghii tratt as juice, SOD was put in the juice and mixing as 15mg/kg and 10mg/kg, which were named as number 3 and 4 separately. The juice was mixed with some sugar and put in the bottle named SOD enriched rosa roxburghii tratt juice or 874 syrup, every bottle contained 350ml. It conformed to the standard of food hygiene in PRC.
2. ***Subjects****:* A total of 61 old people all were living in rehabilitation centers, their ages were 50-93 average 70.6, male 30 and female 31, they did not suffer with cardiovascular-renal diseases, diabetes and hyperlipidemia. They were randomly divided into two groups; the two groups were supplied with No. 3 and No. 4 by double blind, twice every day for 2 months. The vein blood SOD, hemoglobin (Hb), catalase(CTS) and lipids peroxide (LPO) were determined pre-oral and post oral administration of the juice.
3. ***Assay Methods***
    1. SOD 125I-SOD-radioimmunoassay. Vein blood 20ul plus redistilled water 2ml, to shake it to hemolysis and test Hb same time. SOD=test(ng)x1010/Hb.
    2. CTS ability. Ultraviolet spectrophotometer. According to the absorption value of H_2O_2. at 240nm wavelength, the unit of enzyme activity (u/ml) was calculated.
    3. LPO, fluorospectrophotometry. LPO-F/Sx25nmol/ml

Results

1. ***The effect of different SOD dosage on SOD, CTS and LPO in old people:*** A total of 32 old people were given No 3, 29 old people were given No. 4 The results showed that SOD increased ($p<0.01$) and LPO decreased ($p<0.05$) significantly after orally taking No. 3. SOD increased ($p<0.05$) significantly after orally taking No. 4. CTS were not changed significantly.

TABLE 1
The effects of different SOD dosages to SOD, CTS and LPO in old people (x±s)

Dosage	n	SOD (ng/mg Hb)		CTS(u/g Hb)		LPO(nmol/ml	
		Before	After	Before	After	Before	After
No 3	32	1178.51 ±222.54	1842.69** ±253.51	28086.1 ±5569.3	27026.4 ±3771.7	4.94 ± 0.94	3.09 ± 0.85
No. 4	29	1131.72 ±194.38	1541.33* ±201.21	21537.7 ±4646.3	22866.8 ±4714.2	4.97 ±1.20	4.17 ±0.70
Total	61	1157.15 ±204.36	1694.01* ±231.11	24914.7 ±5371.6	24986.7 ±4543.3	4.94 ±0.94	4.03 ±0.78

*p<0.05 ** p<0.01 (same in other table)

2. **The effects of age after orally taking the juice:** The subjects were divided into 5 groups by every 10 years from 50 years old. SOD was increased significantly at the 50-89 years old group. LPO decreased significantly at 50-79 and 90-93 years old groups. CTS was not changed significantly at each group.

TABLE 2
The effect of different age groups to SOD, CTS and LPO in old people(x±s)

Age	n	SOD (ng/mg Hb)		CTS(u/g Hb)		LPO(nmol/ml	
		Before	After	Before	After	Before	After
50-59	13	1150,08 ±179,31	1678.18** ±368,32	23317.6 ±6785,2	23414,1 ±1958,8	5.45 ±2,19	4.29* ±1.04
60-69	17	1119,31 ±225,51	1717,31* ±391,25	29596,8 ±5383,5	27428,8 ±5931,1	5.67 ±0,79	3.80* ±0,67
70-79	12	1214,25 ±245,70	1862,92** ±284,18	24632,0 ±4669,9	24292,9 ±4124,7	4.87 ±0.67	4.01* ±0,73
80-89	16	10724,29 ±182,22	1752,22* ±293,70	22772,7 ±3829,3	24493,1 ±3358,8	4.73 ±0,81	4.16 ±0,61
90-93	3	1082,33 ±107,31	1133,01 ±241,7	24337,3 ±6837,0	24221,3 ±5033,9	4.60 ±0,28	3,80* ±0,60

3. **The effects of different sex groups to SOD after orally taking the juice:** CTS and LPO were not changed significantly in males, but SOD increased and LPO decreased significantly in females, CTS was not changed.

TABLE 3
The effect of different sex groups to SOD, CTS and LPO in old people(x±s)

Sex	n	SOD (ng/mg Hb)		CTS(u/g Hb)		LPO(nmol/ml	
		Before	After	Before	After	Before	After
Male	30	1127,35 ±234,33	1526,61 ±229,58	26018,6 ±2692,0	26177,2 ±462,6	4.76 ±0,83	4.17 ±0,73
Female	31	1152,65 ±184,94	1852,41 ±278,75	24516,5 ±5363,4	23839,2 ±4579,3	5.15 ±1,03	3.94* ±0,81

Discussion

Rosa roxburghii tratt belongs to Rosaceae and Rosa. It grew up in the Guizhou Province and its natural resources are rich. It tastes sour and puckery. It is considered as promoting digestion, anti-inflammation, stooping diarrhea, relieving summer-heat and tranquilization in traditional Chinese medicine. Recently, it was found that it contains an abundance of SOD, it is concerned to have the effect of anti-senility. The human body senility is related to imbalance in cleaning. (the free radical excess of the body senility

process will be accelerated). SOD is only free radical cleaning factor, it is able to clear super oxidative anion free radicals($.0_2$)
SOD

$2.O_2 + 2H + \text{->->->} O_2 + H_2O_2$
The hydrogen peroxide (H_2O_2) can be decomposed to water and oxide by CTS and glutathione peroxidase (GSH-PX) catalysis. Intercorporal oxidative free radical ($.O_2$) and hydroxyl-free radical excessive will damage nucleic acid, protein, mucopolysaccharide, lipid and make unsaturated fatty acid to peroxidate at biomembrane, producing LPO. LPO can be linked with free amino acid of protein to Shiff base which can distract the pattern and function of protein causing body senility.

We use SOD, CTS and LPO as anti-senility research indexes. After subjects orally took the rosa roxburghii tratt juice with SOD, the blood SOD increased and LPO decreased significantly. The effect of No. 3 was better than No. 4.

The result was in agreement with clinical surveys. It showed the internal SOD activity increased which excessive $.O_2$ is cleared after orally taking the rosa roxburghii tratt juice with SOD, at the same time lead LPO significance decreased and reduced the peroxidate effect at biomembrane, delaying the senility process in the body. Using SOD pharmaceutics treatment, the people who had high LPO/SOD ration to obtain obvious effect.

The rosa roxburghii tratt juice with SOD is natural fruit juice and stable by heat and acid. It has enriched resources and good taste, it is beneficial to spread and use. But it is not stable and changes the nature in strong acid. There are 90% Zinc (Zn) of natural Cu . Zn-SOD to drop in pH3.6 environment. The stomach acid is pH 0.9-1.5 in the human body, the effect mechanism of rosa roxburghii tratt juice with SOD will be studied in this acid environment

Some works showed that SOD activity of human red blood cells (RBC) would decrease as you age, the blood lipid peroxidate would increase as age increases to highest after 60 years old.
The result was in agreement with ours. SOD increased significantly in 50-89 years old groups after they were orally given rosa roxburghii tratt juice with SOD. LPO decreased significantly except 80-89 years old groups. LPO/SOD ratio significance decreased. The clinical symptom obviously were improved. This results showed the juice has the effect of anti-senility.

The effect of anti-senility was better in female than male. SOD increased and LPO decreased significantly after the female were given rosa roxburghii tratt juice orally with SOD. The clinical symptom improvement was more obviously in female. The reason is not clear, we will study further.
The mouse showed less activity and lethargy. The body weight of mouse were closed in different groups. Liver/body weight ratio 50% juice group, 100% juice group and CC14 control group were separately 0.04± 0.004**,** 0,04± 0.003 and 0.04± 0.005, three groups were higher significantly than blank control group (0.03± 0.002),$p<0.01$

2. ***The tissue homogenate of liver and serum observation item test***: MDA of liver tissue increased significantly in CC14 control group to blank control group and 100% juice group, $p,<0.01$. and $p ,<0.05$ GHS of liver tissue decreased significantly CC14 control group to 50% juice group and 100% juice group, $p,<0.01$ SGPT and SGOT activity increased significantly in CC14 control group to blank control group, 50% and 100% juice group, $p<0.01$ and $p<0.05$. MDA, SGPT and SGOT activity increased significantly in two juice groups to blank control group ($p<0.01$ and $p<0.05$).

The results show in Table 4.

TABLE 4
The tissue homogenate of liver and serum observation item test.

Group	n	MDA (mnol/L)	GSH (mmol/kg)	SGPT (mmol · s-1/L)	SGOT(mmol · s-1/L)
Blank Control	5	381,41 ± 27.24**	--	2.35 ± 0.36**	16.94 ± 1.37**
50% Juice	8	439,10 ± 32,05**	16,93 ± 1.73**	14,42 ± 4.96*##	31,49 ± 11,35**#
100% Juice	8	419,87 ± 28,84**	21,27 ± 3.62**	16,41 ± 7.19*##	32,60 ± 10.29**##
CC14 control	8	451,92 ± 21,69	13,88 ± 2.51	27,88 ± 9.70	50.97 ± 6.52

Compare with CC14 control group, * p<0.05 ** p<0.01
Compare with blank control group, # p<0.05 ##p<0.01

3. ***The hepatic histopathology test:*** The structure of hepatic lobules were normal in each group. There was lightly cloudy swelling and hydropic change in hepatic cells in two juice groups, 100% juice group was more obvious. There was cloudy swelling, hydropic or lipid changes, nuclear disappeared and cytoplasm solution hepatic cells in CC14 control group. There were no obvious changes in blank control groups.

Discussion

CC14 is a strong oxidizer. Trichloromethane free radical (CCl3) which is metabolic production of CC14 produced peroxide actions to lipid peroxide in hepatic cytomembrane and endoplasmic reticulum, membrane protein and membrane structure were distracted, hepatic cells were necrosis. In this research, GSH, MDA content in hepatic cells, SGPT and SGOT activities were significantly different between the groups that mouse were given rosa roxburghii tratt juice and CC14 control group. Although liver/body weight ration MDA content, SGPT and SGOT activity showed hepatic cells injury in test groups, the results showed the rosa roxburghii tratt juice had protective effects to hepatic cells injury by CC14 leading.

CC14 distracted hepatic cells by lipid peroxide actions. The action mechanism of rosa roxburghii tratt juice which protected hepatic cell injury from CC14 may be keeping stability of reduction GSH. When CCl3 free radicals were produced by CC14 in liver, GSH was linkage with these free radicals to produce thioether amino acid evacuation out of the body. Hepatic cells were injured when GSH were exhausted in the body. The reduction of vitamin C which is enriched in rosa roxburghii tratt juice reacted to CCl3 free radical as a electron donor, CC130 is changed CC1302 loosing chemical activity, GSH exhaustion is stopped so that lipid peroxide is reduced at hepatic cells membrane

We gave rosa roxburghii tratt juice to mice, the results showed the protective action which was anti-hepatic toxicity of CC14 were the same distribution of 50%-100% concentration. In this study, we used acute poison pattern dosage of CC14 Because CC14 dosage was too high, hepatic cells injury appeared in

test groups. But the results showed rosa roxburghii tratt juice had the protective action which as anti-hepatic toxicity of oxidative toxicant. The safety dosage of rosa roxburghii tratt juice blocking hepatic toxicity of CC14 will be studied further.