THE EVALUATION OF THE EFFECTIVENESS OF RESVERATROL IN BLOOD PRESSURE

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The beneficial effects of resveratrol on the cardiovascular system have been demonstrated by numerous studies. It reduces myocardial fibrosis and that of heart valves, supports the organism in ischemia syndrome and prevents platelet aggregation, thus proving an effective cardioprotective.

In the present study we intended to evaluate the effects of resveratrol on hypertension in patients with stroke. The study was conducted over a period of 12 months, on a total of 164 patients divided into two study groups. The results showed a moderate effect of resveratrol on systolic blood pressure (SE=0.51), and in the case of diastolic blood pressure the effect was modest (SE=0.36).

Key words: resveratrol, hypertension, oxidative stress, diastolic blood pressure, systolic blood pressure.

INTRODUCTION

Studies show that oxidative stress is increased in patients with essential hypertension, renovascular hypertension, malignant hypertension, salt-sensitive hypertension, hypertension induced by cyclosporin and preeclampsia (Ungvari Z., et al, 2010; Ones K. et al, 2005; Buck D. et al, 2000)These findings are largely based on the recorded high levels of biomarkers of lipid peroxidation and oxidative stress.

Hypertensive patients show a significantly higher production of H_2O_2 in the plasma than normotensive subjects (Shihabi A. et al, 2002). In addition, normotensive subjects with a family history of hypertension manifests higher production of H_2O_2 than those without a family history of hypertension, suggesting that there may be a genetic component which leads to increased production of H_2O_2 (John JH. et al, 2002). Plasma concentrations of asymmetric dimethylarginine (ADMA), an inhibitor of endothelial NOS (eNOS), and 13-hydroxyoctadecadienoic acid, a marker of ROS production are increased in patients with hypertension (Ungvari Z. et al, 2010)

The production of ROS is higher in the arteries at hypertensive patients and is associated with up regulation of NADPH vascular oxidase (YiLin R., et al, 2013). Indeed, the importance of NADPH oxidase contributes to oxidative stress and to human cardiovascular diseases and are reflected in a number of polymorphisms in the NADPH oxidase that occur in hypertension and atherosclerosis (IUPAC, 2003). Some isoforms of NADPH oxidase may be more relevant than others, which is an important

area of investigation in the pathogenesis of hypertension. Prototype, no significant changes in blood pressure was detected.
In addition to the mechanisms that generate excessive ROS, mechanisms which interfere with the antioxidants are also important for patients with hypertension. Reducing antioxidant defense may come from deficiencies in superoxide dismutase, glutathione peroxidase, or catalase. (Shihabi A. et al, 2002; John JH. et al, 2002)

More than that, superoxide dismutase activity correlates inversely proportional to the blood pressure in patients with hypertension. Consequently, antioxidant substances help reduce blood pressure and arterial stiffness in patients with diabetes, but they seem to have no effect on menopausal women, in healthy subjects or in preventing preeclampsia (John JH. et al, 2002; Ungvari Z., et al, 2010; Ones K. et al, 2005)

Epidemiologically it has been suggested that polyphenols in fruits, vegetables, green and black tea, and some wines may reduce cardiovascular risk. The green tea polyphenols, for example, improve the functional characteristics of vascular endothelial, insulin sensitivity, reduce blood pressure, protect against myocardial infarction (Csiszar A., et al 2006). Polyphenols of interest include resveratrol, naringenin, quercetin and catechins. Resveratrol is probably the best known of them, seems to exert its effects by stimulating endothelial cells SIRT1, which regulates endothelial vasodilation (Gresele P., et al, 2011).

The purpose of this study is to assess the effectiveness of resveratrol on hypertension in patients with stroke.

MATERIAL AND METHOD

A comparative study was performed between 2 groups of patients:

I - study group who received complementary treatment with resveratrol associated with allopathic medical treatment;

II- control group which performed only allopathic treatment.

Each patient in the study group was given a daily amount of 100mg of resveratrol as a single dose administered before 12 a.m.

The study group included 78 patients and the control group 86 patients.

The criteria for inclusion in the study were:

- men and women who have suffered an ischemic stroke;
- duration since stroke to the beginning of therapy less than or equal to 12 months;
- men and women aged over 18 who were able to express consent knowingly or whose companions gave their consent;
- patients which until now have not been treated with resveratrol supplements type;

The criteria for exclusion from the study were:

- patients who have a history of stroke;
- patients who have benefited from previous recovery program;
- patients who experienced recurrence of stroke during the study;
- patients who have not been able to attend all the 3 evaluations.

Investigation of hypertension was performed by determining the blood pressure of all subjects included in the study respecting the recommendations of the European Society of Hypertension, 2007. Classification was done according to the European Hypertension Guide 2007 (table1) (Mancia G et. Al. 2007).

Table 1

BP Classification according to the European Hypertension Guide 2007

SBP value (mmHg)	DBP value (mmHg)	Category
<120 mm Hg	<80 mm Hg	Optimal
<130 mm Hg	<85 mm Hg	Normal value
130-139 mm Hg	85-89 mm Hg	Highest normal value
140-159 mm Hg	90-99 mm Hg	Value of first degree easy HBP
160-179 mm Hg	100-109 mm Hg	Second degree moderate HBP
>180 mm Hg	>110 mm Hg	Third degree severe HBP

The measurement of blood pressure was done in three stages: initially, at 6 months and at 12 months. To quantify the sensitivity of measurement we have used statistical calculation system "effect size" (ES).

ES is a method of standardizing the magnitude of change in a variable after a specific period of time. It represents the average change for a variable expressed in units of standard deviations. This standardization allows comparison of the change of variables in a study. The ES can be used to compare the same variables between different studies.

RESULTS AND DISSCUSIONS

Evolution of blood pressure value since study entry to 6 and respectively 12 months is presented in table 2.

Table 2

Evolution of blood pressure values

BP (mmHg)	Study lot		Control lot	
	Systolic BP	Diastolic BP	Systolic BP	Diastolic BP
Initially	147,21±15,30	88,27±11,31	148,02±15,20	87,55±11,27
At 6 months	142,02±15,27	85,91±11,22	146,00±15,41	86,49±11,36
At 12 months	139,35±15,21	84,25±10,78	145,22±15,36	85,71±11,12

Systolic blood pressure

Systolic BP values decreased after 6 months in the group receiving resveratrol from 147.21 mm Hg to 142.02 mm Hg, resulting in a measure of the effect size of ES=0.34, while in the group without resveratrol systolic BP values showed a minimum decrease (from 148.02 mm Hg to 146.00 mmHg), the effect size being SE=0.13.

In the following six months in the group receiving resveratrol we notice a decrease in systolic BP values from 142.02 mm Hg to 139.35 mmHg, resulting in an effect size ES=0.17, while in the group without resveratrol the effect size ES=0.05 was (from 146.00 mm Hg to 145.22 mm Hg).

Compared to the initial evaluation at 12 months in the group receiving resveratrol the effect size was ES=0.51, while in the group without resveratrol the effect size was ES=0.18 (figure 1).

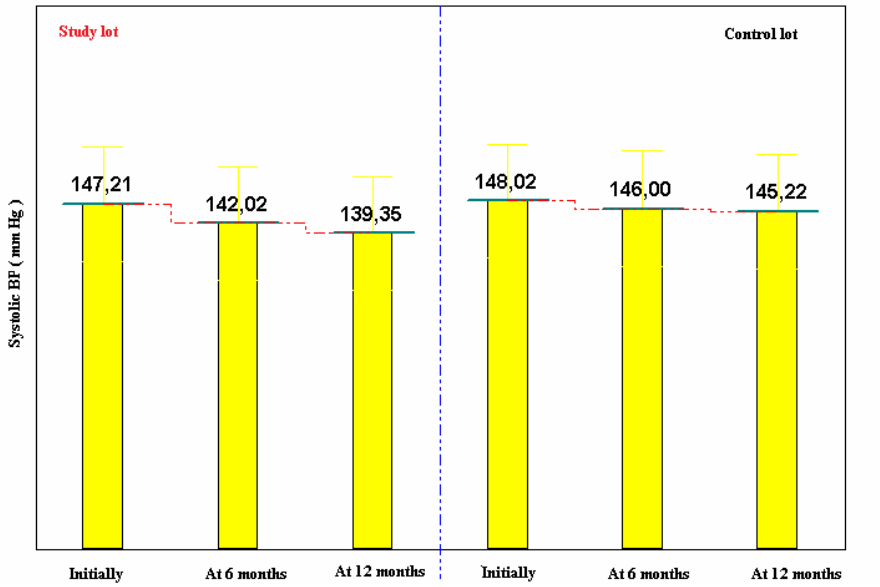

Fig.1 The mean values of systolic BP

Diastolic blood pressure

Diastolic blood pressure values have decreased after 6 months, in the group receiving resveratrol from 88.27 mm Hg to 85.91 mm Hg, resulting in an effect size ES=0.21, while in the group without resveratrol, diastolic blood pressure values recorded a minimum drop (from 87.55 to 86.49 mm Hg), the effect size being SE=0.09.

In the following six months in the group receiving resveratrol we notice a decrease in diastolic BP values from 85.91 mm Hg to 84.25 mm Hg, resulting in an effect size ES=0.15, while in the group without

resveratrol, the effect size was ES=0.07 (from 86.55 mm Hg to 85.71 mm Hg).

Compared to the initial evaluation at 12 months in the group receiving resveratrol the effect size was ES=0.36, while in the group without resveratrol, the effect size was ES=0.16 (figure 2).

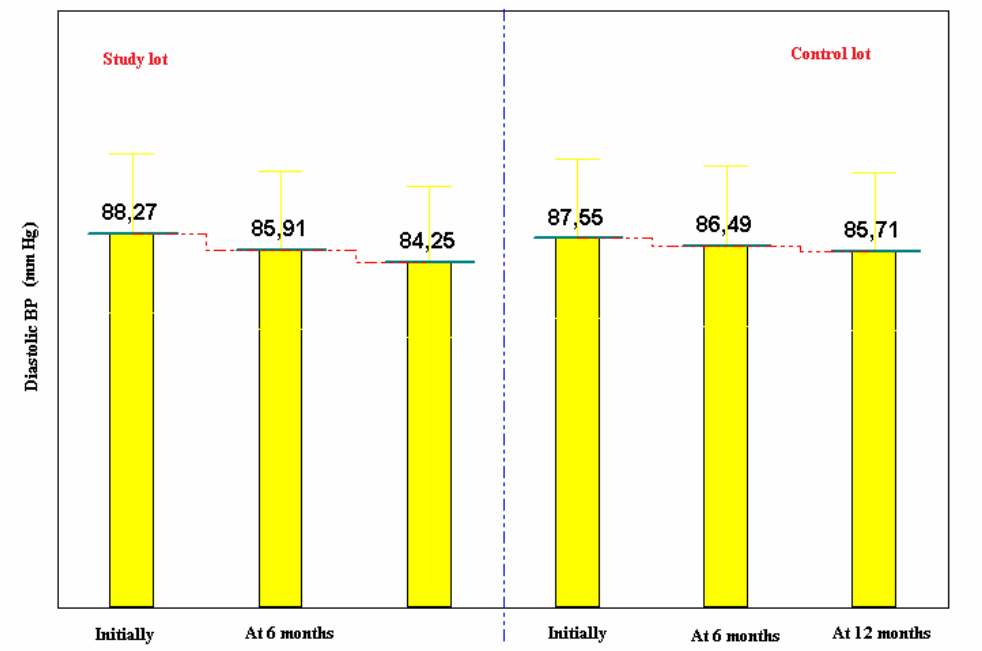

Fig.2 The mean values of diastolic BP

CONCLUSIONS

The effect of resveratrol on systolic blood pressure was moderate (ES=0.51) and for diastolic blood pressure it was modest (ES=0.36).

A further study over a longer period of time and hypertensive patients without serious conditions associated would be of real benefit to elucidate the effects of resveratrol on HBP.

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