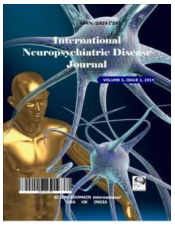

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Resveratrol Reduces C-reactive Protein and Cholesterol in Schizophrenia

Karine Zortea[1,2*], Viviane Carvalho Franco[1,2], Lenise Petter Francesconi[1,2] and Paulo Belmonte-de-Abreu[1,2]

[1]Schizophrenia Program, Hospital de Clínicas de Porto Alegre, Porto Alegre, RS, Brazil.
[2]Programa de Pós-Graduação em Psiquiatria e Ciências do Comportamento, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil.

Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Patients with schizophrenia (SZ) are generally found with overweight and obesity and several metabolic disorders. Additionally these patients have less life expectancy, with cardiovascular disease (CVD) the main cause of increased mortality in these patients. This is a case-report study of a male, 46 years old, with Diagnosis of SZ following a 1-month resveratrol supplementation program. In summary, we observed association of resveratrol supplementation (200 mg/day) with reduced C-reactive protein (CRP), and reduced cholesterol and triglycerides. The benefits included the improvement in Framingham score and mean reduction of 3% of risk of a heart attack over the next 10 years.

Keywords: Schizophrenia; Cardiovascular Diseases; Inflammation; Resveratrol.

1. BACKGROUND

Patients with schizophrenia (SZ) are generally found with overweight and obesity and several metabolic disorders. Additionally these patients have less life expectancy, with cardiovascular disease (CVD) the main cause of increased mortality in these patients [1].

**Corresponding author: E-mail: karine.personaldiet@gmail.com;*

Several studies support a link between inflammation and atherogenesis. Low-grade inflammatory status in overweight persons has been proposed as one of the mediating processes in metabolic disease development, such as CVD and diabetes [2]. Elevated C-reactive protein (CRP) is predictor of CVD events in the general population [3]. To prevent these factors, many food compounds have been reported to have anti-inflammatory and antioxidant effects in human metabolism [2] and there are some evidences that resveratrol supplementation have a significant potential benefits to treat disorders like CVD [4].

Resveratrol is a natural polyphenolic compound with cardioprotective, anticancer and anti-inflammatory properties [4], involved in anti-atherogenic activities and vasculoprotection [5], identified in more than 70 species of plants, including grape-vines (*Vitis vinifera*), mulberries, and peanuts. Additionally, a recent meta-analysis of 10 studies suggested that the consumption of this polyphenol lowered CVD risk [6]. According to this line of evidences, the objective of this study was to determine the efficacy of resveratrol supplementation on inflammatory status and CVD risk prevention in patient with SZ.

2. CASE REPORT

This is a case-report study of a male, 46 years old, with Diagnosis of SZ by Structured Clinical Interview for DSM-IV-Axis I Disorders (SCID-I), following a 1-month resveratrol supplementation program, covered by Public Health Assistance at the Schizophrenia Program of Hospital de Clinicas de Porto Alegre (HCPA), Brazil. The research participant provided signed, informed consent and was on stable dose of atypical antipsychotics for 6 months. This research study was approved by the Research Ethics Committee/HCPA (register number: 110553).

Clinical evaluation included anthropometric measures (weight, height, waist circumference, body mass index – BMI), smoking status, physical activity, biomarker of inflammation (CRP), fasting glucose and lipid profile (cholesterol, LDL, HDL, triglycerides). All measures were taken on the first and the last day (day 1 and day 30) in a 1-month follow-up.

The subject took 2 dietary supplements each day (200mg of resveratrol). Resveratrol was obtained from a manipulation pharm (*trans*-resveratrol, 98% purified) in Porto Alegre, RS, Brazil. He was instructed to take the first supplement after the baseline measurements (day 1) and the last supplement in the end of 4 weeks (day 30). The subject was instructed to abstain from foods containing substantial amounts of resveratrol (e.g., wine, red grapes, peanuts, and berries) and was advised not to take any other food supplements and maintain their usual diet and physical activity during the study period. To ensure that the subjects adhered to the study protocol the team used two practices: a) telephone calls every week over the study; b) pill count in the last day (day 30).

The characteristics of the subject are described in Table 1. After 30 days resveratrol supplementation, the subject displayed reduced waist circumference and measures of cholesterol, LDL, HDL, triglycerides and CRP, with a slight increase in weight, BMI, body fat percentage and number of smoked cigarettes. There were no changes in medication, exercise and glucose, without significant adverse events.

3. DISCUSSION

In summary, we observed association of resveratrol supplementation (200 mg/day) with reduced CRP, and reduced cholesterol and triglycerides. The benefits included the improvement in Framingham score [7,8] and mean reduction of 3% of risk of a heart attack over the next 10 years.

In a similar research, resveratrol inhibited astrocyte production of CRP, which plays a role in a variety of chronic inflammatory disorders. This suggests that resveratrol may be an effective therapeutic agent in neurodegenerative diseases initiated or maintained by inflammatory processes [9].

A recent study showed that nutraceuticals, including resveratrol, are effectively able to reduce the burden of the atherosclerosis process. The main mechanisms that explain such a positive action on the cardiovascular system are not well understood but the result supports the hypothesis about the use of nutraceuticals in primary cardiovascular prevention protocols to reduce the overall burden of cardiovascular disease morbidity and mortality [10]. According to this line of evidences, the case provides additional support for the protective effect of resveratrol in different pathological conditions, associated with reduced risks of CVD, cancer and diabetes, maybe through its anti-inflammatory effect [4].

Table 1. Characteristics of subject with schizophrenia in resveratrol supplementation

Characteristics	Day 1 (Baseline)	Day 30	Results
Age (years)	46	46	=
Clozapine dose (mg)	600	600	=
Smoking (yes/not)	Yes	Yes	=
Number of cigarette/day	6	10	↑
Exercise (yes/not)	Yes	Yes	=
Weight (kg)	83,2	83,7	↑
BMI (kg/m^2)	26,11	26,26	↑
Waist circumference (cm)	111	110	↓
Body fat percentage (%)	29,7	30,1	↑
Glucose (mg/dL)	103	103	=
Cholesterol (mg/dL)	187	161	↓
LDL (mg/dL)	110,4	94,8	↓
HDL (mg/dL)	36	34	↓
Triglycerides (mg/dL)	203	161	↓
CRP (mg/dL)	8	4	↓
Framingham score (%)	10	7	↓

BMI: Body Mass Index; CRP: C-reactive Protein

This case-report is a pilot study and there are some limitations. The case was selected by convenience, and could represent a special case, with additional unidentified protective factors. Because of this, it is important to confirm these results with larger samples. Second, it may be necessary assessment of additional blood biomarkers (e.g. cytokines and oxidative stress) to increase generalizability of effects of resveratrol add-on.

Despite these limitations, the case provides additional effect of resveratrol supplementation with a decrease in lipid profile, in inflammation, and may help prevent CVD risk. We think this can improve therapeutic and clinical outcome, and individual quality of life.

4. CONCLUSION

In conclusion, we have shown that 4 weeks of a resveratrol supplementation (200 mg/day) may reduce inflammation and improve lipid profile. These findings indicate that resveratrol deserves additional attention for the clinical care of SZ, by its role in comorbidity prevention and protective effect over CVD in SZ. Further studies in larger cases are needed to implement the actual findings associated with this hypothesis.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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