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A Combination of *Moringa oleifera*, *Bryophyllum pinnatum* and Vitamin C in the Management of Key Risk Factors for Cardiovascular Disease

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Abstract

Hypertension, high cholesterol and diabetes are risks factors associated with cardiovascular disease; with hypertension being the leading risk factor. Here we investigated the effect of a herbal combination of *Moringa oleifera, Bryophylum pinnatum* and vitamin C on specific parameters in persons with or at risk for cardiovascular disease.

Objective: To determine the outcome regarding the use of a potent antioxidant dietary supplement consisting of *Moringa oleifera*, *Bryophyllum pinnatum* and Vitamin C on blood pressure, cholesterol levels and blood glucose levels in persons with or at risk for cardiovascular disease.

Materials: Sixty-six participants received a potent antioxidant dietary supplement formulated from vitamin C, and the herbs *Moringa oleifera* and *Bryophyllum pinnatum*. Participants were screened and provided with the dietary supplement in the form of a capsule, and were instructed to consume one capsule daily for a period of six months. At the commencement of the study and once a month, participants' blood pressure was assessed and, blood tests and a quality of life questionnaire were completed in the clinical setting. The data obtained from the laboratory tests and the questionnaires was recorded. The accumulated data and the researcher's observations were used to determine feasibility.

Results: Of the participants initially screened at the commencement of the study, 62.1% completed the study. After one month of supplement use female participants experienced a 3.26% change in diastolic blood pressure. After three months of supplement use blood glucose levels among participants decreased by 1.81%. Laboratory tests results showed that Low Density Lipoprotein cholesterol levels decreased by 5.6% among female participants only, whereas High Density Lipoprotein cholesterol levels increased among all participants.

Conclusion: Aggregate data suggests that this specific formulation of *Moringa oleifera*, *Bryophyllum pinnatum* and vitamin C, may assist with the management of risk factors for cardiovascular disease, and is supportive of the implementation of a long-term randomized clinical trial.

Keywords: Cardiovascular disease; Heart disease; *Moringa oleifera*; *Bryophyllum pinnatum*; Vitamin C; Diabetes; Hypertension; Cholesterol

Abbreviations

HDL: High Density Lipoprotein; LDL: Low Density Lipoprotein

Introduction

Research has shown that botanicals *Crataegus Oxycantha*, and the Ayurvedic botanical, *Inula Racemosa* may offer individuals cardioprotective benefits. Although research regarding vitamin C, *Moringa oleifera* and *Bryophyllum pinnatum*, to a lesser extent, is readily available and demonstrates the antiglycemic, hypotensive and lipid-lowering effects of these ingredients; apart from the research published in Volume 7, Issue 2 of the Free Radicals and Antioxidants Journal, no study has been published which has investigated a formulation of these three components [1-6].

Materials and Methods

We completed a longitudinal pilot study in which 31 females and 35 males, ages 23 to 83 years of age, were enrolled.

Baseline data collection included information on medical history, standardized blood pressure assessment, anthropometric measurements and laboratory tests. A form designed specifically for data collection during the study was used to record participants' medical history.

Strict inclusion and exclusion criteria were adhered to during stage one (Screening and Enrollment Stage) of the study. Those persons who were enrolled progressed through the study as stated in Figure 1.

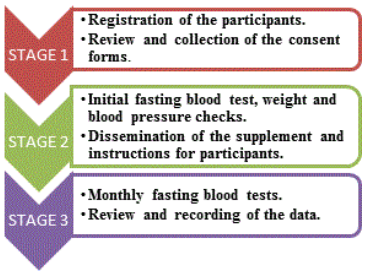

Figure 1: Participants' Progression through the Study.

Participants were selected based on their past medical history of cardiovascular disease or a family history of heart disease and the presence of two or more risks factors for cardiovascular disease. Risk factors included a total cholesterol equal to or greater than 5.2mmol/L, a Low Density Lipoprotein (LDL) cholesterol level 4.13mmol/L or higher, blood pressure greater than or equal to 140/90mmHg, a sedentary lifestyle (<2 days a week of physical activity apart from activities of daily living), a body mass index (BMI) greater than 30kg/m2 and /or a fasting plasma glucose of 100mg/dL to 125mg/dL on three or more occasions or a diagnosis of diabetes one year or more prior to enrollment in the study.

During the screening process persons with kidney disease, renal insufficiency, persons with a family history of cardiovascular disease but none of the outlined risk factors and those who were critically ill were excluded from the study.

Following the completion of the informed consent document each participant completed a series of blood tests. This included a total cholesterol, High Density Lipoprotein (HDL) cholesterol, Low Density Lipoprotein (LDL) cholesterol, triglycerides, fasting blood glucose, HbA1c test and Haemoglobin test. The participants were all required to complete a quality of life questionnaire which was used to record changes to their appetite, gastrointestinal condition, energy levels, sleep, mental state and physical changes.

Blood pressure was measured using a standard mercury sphygmomanometer and cuff. Blood samples were obtained and were analyzed using a calibrated, point-of-care Reflotron machine. And a digital scale was used to record the participants' weights.

Participants received capsules containing a formulation of 25 mg of *Moringa oleifera*, 25 mg of *Bryophyllum pinnatum* and 700 mg of Vitamin C, and were instructed to take one capsule once daily. Participants were also required to report once a month for blood work and an assessment. All data was recorded using a spreadsheet.

Results

After evaluating the aggregate data varying degrees of change were noted. Of the 66 (n=66) participants enrolled in the study 37.9% (n=25) were lost to follow-up. This was due to noncompliance with the follow-up schedule, relocation, commencement of other therapies and surgical procedures. Analysis of the initial blood pressure readings showed that females presented with an average blood pressure reading which was higher than that of the male participants. Average initial blood pressure reading for females was 132/80 mmHg, while the average initial blood pressure reading recorded for male participants was 130/80 mmHg. After one month of supplement use no significant changes to systolic blood pressure was noted. However, a 3.26% change in diastolic blood pressure was observed among the female participants.

The average blood glucose level recorded for participants during enrollment was 5.33 mmol/L (95.94 mg/dL) with blood glucose levels decreasing by 1.81% after three months of supplement use. Of the 35 males enrolled in the study, one male participant presented with a baseline fasting blood glucose level of 12.9 mmol/L (232.2 mg/dL). It was noted that after seven testing occasions this participant's blood glucose level improved, decreasing by 61% from baseline.

Twenty percent of the participants enrolled in the study presented with a total cholesterol level of 5.2 mmol/L (93.6 mg/dL) or higher. An average initial LDL cholesterol level of 3.11 mmol/L and 2.48 mmol/L was recorded for female and male participants respectively. After three testing occasions LDL cholesterol levels among female participants decreased by 5.6%. Whereas LDL cholesterol levels among male participants remained unchanged. As illustrated in Figure 2, the average initial HDL cholesterol level observed among female participants was higher than that of the male participants. That is 1.17 mmol/L (21.06 mg/dL) for female participants and 1.03 mmol/L (18.54 mg/dL) for male participants (Figure 2). After three months of supplement use, both male and female participants experienced an increase in their HDL cholesterol levels, with male participants experiencing a greater increase in their HDL cholesterol levels than female participants. The male participants' HDL cholesterol increased to 1.24 mmol/L.

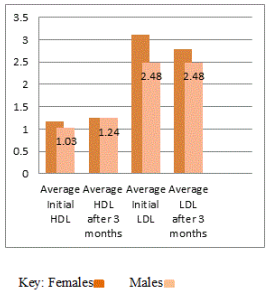

Figure 2: Comparison of HDL Cholesterol and LDL Cholesterol Levels Among Female and Male Participants.

Reprinted from "Preliminary Outcomes on the Use of an Antioxidant Dietary Supplement for Patients with or at Risk of Heart Disease." by Alfred Sparman.

Discussion

The World Health Organization's (WHO) Fact Sheet on Cardiovascular Disease highlights hypertension, diabetes mellitus and hyperlipidemia as key risk factors for cardiovascular disease [7].

In this study blood pressure control, blood glucose levels, total cholesterol levels, HDL cholesterol levels and LDL cholesterol levels were the main outcome measures. Identical methods were used to collect information from each participant and thus reduce any information bias. The observations which were made and the data collected suggested that the study has validity. However, the absence of a control group reduced the internal validity of the study. In general, the results of the study were as expected.

An independent association between blood pressure and the incidence of cardiovascular disease has been demonstrated, and according to the literature, hypertension is a significant modifiable risk factor for cardiovascular disease [8]. Our results showed that one month following enrollment in the study female participants experienced a 3.26% change in diastolic blood pressure. *Moringa oleifera*, a medicinal plant found in tropic and subtropic regions and a key component of the formulation used in the study, has been recognized for its significant nutritional value and antihypertensive effects. The hypotensive effects of *Moringa oleifera* have been attributed, by researchers, to the acetylated glycosides present in this medicinal plant [9-11]. In addition, research conducted in 2002 highlighted the hypotensive activities exhibited by *Bryophyllum pinnatum*. It was suggested that this hypotensive activity may have resulted due to vasodilation and cardiodepression [3].

Our results also showed a 1.81% reduction in blood glucose levels among both male and female participants after three months of supplement use. Correction of hyperglycemia helps to prevent the microvascular complications associated with poorly managed blood glucose levels and diabetes [12]. The antihyperglycemic activity of *Bryophyllum pinnatum* was confirmed by an animal study in which rats with streptozocin-induced diabetes mellitus, presented with lower glucose levels after oral administration of aqueous *Bryophyllum pinnatum* extracts [5]. Vitamin C, a well-known antioxidant is also noted to support blood glucose control. In a 2007 study results indicated that supplementary vitamin C may help to decrease blood glucose levels and lipids in persons with noninsulin dependent diabetes mellitus [13].

In lipid intervention trials where diabetic subpopulations were analyzed, results suggested that correction of lipoprotein abnormalities will lead to a decrease in coronary artery disease [12]. Our results indicated that after three months of supplement use HDL cholesterol levels increased in both male and female participants, with males experiencing a greater increase in their HDL cholesterol levels. Data indicated that after three testing sessions LDL cholesterol levels decreased by 5.6% among female participants.

The findings of this research demonstrate the potential of this specific vitamin C and herbal formulation to assist with the management of risk factors associated with cardiovascular disease. A larger study population and randomized, double-blind evaluation is required sequentially to offer more insight into the efficacy of this formulation in managing risk factors for cardiovascular disease. The findings indicate that the combination of *Moringa oleifera*, *Bryophyllum pinnatum* and vitamin C may increase HDL cholesterol levels, decrease LDL cholesterol levels and lower blood glucose levels.

Conclusion

Consistent use of a combination of *Moringa oleifera, Bryophyllum pinnatum* and vitamin C, which contains the chemical constituents, flavonoids and polyphenols, exhibits hypotensive, antihyperglycemic and cholesterol lowering effects in persons with or at risk of cardiovascular disease.

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References

1. Miller AL (1998) Botanical Influences on Cardiovascular Disease. Alterna Med Rev J Clin Thera 3: 422-431.
2. Anwar F, Latif S, Ashraf M, Gilani AH (2006) Moringa oleifera: A food plant with multiple medicinal uses. Phytot Res 21: 17-25.
3. Ojewole J (2002) Antihypertensive properties of Bryophyllum pinnatum (Lam Oken); leaf extracts. Ameri J Hypertens 15: 2-10.
4. Sabharwal AK, May JM (2007) α-Lipoic acid and ascorbate prevent LDL oxidation and oxidant stress in endothelial cells. Mol and Cellul Biochem 309: 125-132.
5. Goyal P, Jain N, Panwar N, Singh G, Nagori B (2013) Investigation of Hypoglycemic and Antidiabetic Activities of Ethanol Extracts of Kalanchoe pinnatum leaves in Streptozocin-induced diabetic rats. Int J Pharm Toxicol Sci 3: 9-18.
6. Sparman A (2017) Preliminary Outcomes on the Use of an Antioxidant Dietary Supplement for Patients with or at Risk of Heart Disease. F Radi and Antioxi 7: 152-155.
7. World Health Organization (2017) Cardiovascular Disease.
8. Macmahon S (1990) Blood pressure, stroke, and coronary Heart disease, Part 1: prolonged differences in blood pressure: prospective observational studies corrected for the regression dilution bias. The Lancet 335: 765-774.
9. Makkar H, Becker K (1996) Nutrional value and antinutritional components of whole and ethanol extracted Moringa oleifera leaves. Ani Feed Sci and Technol 63: 211-228.
10. Faizi S, Siddiqui BS, Saleem R, Siddiqui S, Aftab K, et al. (1994) Isolation and Structure Elucidation of New Nitrile and Mustard Oil Glycosides from Moringa oleifera and their Effect on Blood Pressure. J Natur Prod 57: 1256-1261.
11. Faizi S, Siddiqui BS, Saleem R, Siddiqui S, Aftab K, et al. (1995) Fully acetylated carbamate and hypotensive thiocarbamate glycosides from Moringa oleifera. Phytochem 38: 957-963.
12. Steven DJ (2001) Effect of fenofibrate on progression of coronary-artery disease in type 2 diabetes: the Diabetes Atherosclerosis Intervention Study, a randomised study. The Lancet 357: 905-910.
13. Ardekani MA, Ardekani AS (2007) Effect of vitamin c on blood glucose, serum lipids and serum insulin in type 2 diabetes patients. Indian J Med 126: 471-474.