

## COMPARISON OF THE CHRONICS EFFECTS OF A PASSIVE STRETCHING PROGRAM AND SHIATSU-THERAPY ON THE STRESS PHASE AND BLOOD PRESSURE LEVELS OF HYPERTENSION ADULTS

Carielo, Alessandro A.<sup>1,2</sup>; Nunes, Rodolfo A. M.<sup>1,3</sup>; Pernambuco, Carlos S.<sup>1,7</sup>; Diré, Gláucio F.<sup>4</sup>; Silva, Julio G.<sup>5</sup>; Amorin, Fátima de S.<sup>1</sup>; Cader, Samária C.<sup>1</sup>; Vale, Rodrigo G. S.<sup>1</sup>; Pereira, Alessandra M. P.<sup>6</sup>; Dantas, Estélio H. M.<sup>1,7</sup>

<sup>1</sup>Laboratório de Biociências da Motricidade Humana (LABIMH) da Universidade Federal do Estado do Rio de Janeiro (UNIRIO) – Rio de Janeiro/RJ - Brasil

<sup>2</sup>Universidade do Grande Rio (UNIGRANRIO) – Rio de Janeiro/RJ - Brasil

<sup>3</sup>Bolsista DTI do Conselho Nacional de Pesquisa (CNPq) – nível 1 – Brasil

<sup>4</sup>Universidade Estácio de Sá (UNESA) – Rio de Janeiro/RJ - Brasil

<sup>5</sup>Doutorado em Psiquiatria e Saúde Mental – Universidade Federal do Rio de Janeiro (UFRJ) - Rio de Janeiro/RJ - Brasil

<sup>6</sup>Universidad de Murcia (UM) Murcia –España

<sup>7</sup>Programa Pós-graduação Stricto Sensu em Enfermagem e Biociências – Doutorado (PPGEnfBIO)

Address for **Correspondence**: Alessandro Carielo de Albuquerque  
Street Arlete C. Ayres Wanderley, nº 336 Sulacap – RJ – BRAZIL - CEP 21745-650 Tel (21) 95291430 e-mail: anatomy.carielo@gmail.com

### ABSTRACT

The aim this study was compare the chronics effects of a passive stretching and therapy shiatsu program on the stress phase and blood pressure levels of hypertensions adults. 23 subjects of both genes, divides in two groups, volunteered to participate this study. Passive stretching program group (PSP) was compost of 12 subjects, while the Shiatsu therapy program group (STP) consisted of 11 subjects. To analysis the data referents, the blood pressure levels and stress phases were collected in moments different (before, during and after the treatment). Statistic Treatment was realized to a variance analysis (ANOVA Three-way model 2 x 3), to verify percentage variations ( $\Delta\%$ ) in the media of the dependence variables (Blood Pressure: Before x during x after), and still, Kruskal-Wallis test that if undertake to compare the answers of the stress questionnaire. Statistic significance admitted a level of  $p < 0.05$ . Results showed that PSP group obtain improve ( $p < 0.05$ ) in  $\Delta\%$  SBP ( $\Delta = -15,39 \pm 13,79$ ;  $p = 0,01 < 0.05$ ) and  $\Delta\%$ DBP ( $\Delta = -14,21 \pm 12,98$ ;  $p = 0,00 < 0.05$ ). After the protocol treatment, occurred improve of the stress levels ( $p < 0.05$ ), decreasing the number of subjects that was in exhaustion phase, classified for the questionnaire. However, results showed that after five weeks of treatment, subjects of the STP

group no improvement ( $p>0.05$ ) in never of the variables. Our Concluded that PSP group during the treatment has results most satisfactory in relation to percentage variation of the blood pressure levels and stress phase than STP group.

**Key words:** Hypertension, Blood Pressure, Stress Phase, Passive Stretching and Therapy Shiatsu Program

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## INTRODUCTION

The arterial hypertension is a polygenic disease that results in anomalies in the blood pressure control mechanisms [1,2]. This anomaly, which is called arterial hypertension, was defined as systolic blood pressure greater that 140 mmHg and diastolic blood pressure superior the 90 mmHg [2,3]. However Brandão et al. [4] suggest classifications with larger rigor, such as blood pressure normal elevated (130-139 x 85-89 mmHg), hypertension of first stage (130 x 90 mmHg), hypertension of second stage (160 x 100 mmHg), hypertension of third stage ( $> 180 \times 110$  mmHg) and systolic hypertension ( $>140 \times < 90$  mmHg).

One of the greater problems of Public Health in the Brazil is the hypertension arterial disease, no only to the prevalence elevated of case, but still, to the population accentuated with no diagnostic and/or no treated [2,5]. About 14 millions of the Brazilian Population is bearer of the arterial hypertensions disease. However, 15% of this total, are adults in economically activity age, increasing significantly the socials costs for absent and invalid to work [6].

Factors different have relation with the etiologic of the hypertension disease, as for example, sedentary, obesity, ageing, smoke, diabetes mellitus, work, social factors and stress [7]. Stresses phenomena have been used to define situations that caused physiology and psychology changes in humans [7,8]. It is acknowledged on the harm of the stress for heart health, emphatically, for the blood pressure levels [8].

The treatment of the arterial hypertension diseases would be realized for medicaments intervention or no-medicaments interventions [2]. The forms of treatment realized for no-medicament intervention are the physical activity, the lost of fat mass, the dietetic reeducation, the Na<sup>++</sup> control ingest, the biofeedback technical and the muscular relax [2,7,8,9].

Stretching technical is a manner of physical activity that provides support the attained flexibility levels [10]. In accord to Dantas [10], stretching motions would be realized in normal amplitude with minimum possible of physical restrictions. On other hand, shiatsu therapy is a technical arise in the Japan that utilize low and strong touch promoting a muscles relaxes effects and dispersing the circulate energy.

Several studies have examined the relax effects [2,7,11] and different types of physical activity [2,7,13,14], proposing various positives outcomes in the mechanism of the blood pressure. However, the present experiment is the first to utilize the stretching technical versus shiatsu therapy on the blood pressure and stress levels of hypertension adults.

Based in this perspective, the aim this study was realize a comparison of the chronics effects of a passive stretching and therapy shiatsu program on the stress phases and blood pressure levels of hypertension adults.

## **METHODS**

### ***Samples***

Data were collected of subjects with diagnostic of hypertension, sedentary, of both genes, controlled for drugs, totalizing a universe of 23 persons. All testing was conducted according to protocols approved by the Human Research Ethics committee at the Universidade Castelo Branco/UCB-RJ, respecting the norms to

research evolving Humans, to take effect apart in 10 of October of 1996, resolution nº 251. All participating subjects gave their informed consent for writer.

After the data collected, each subject was divided randomly in two groups across a draw. None of each therapy was writer in papers different and, subsequently, took for each subject. Therefore, passive stretching program (PSP) group was composed to 12 subjects with age media to  $52,12 \pm 5,52$ , classified as hypertensions of second stage ( $157,16 \pm 24,08$  x  $95,33 \pm 15,33$  mmHg) and with stress classifications in almost exhaustion, while the therapy shiatsu program (TSP) group was constituted to 11 subjects with age media to  $51,54 \pm 6,93$ , hypertensions of first stage ( $148,90 \pm 14,50$  x  $88,18 \pm 11,73$  mmHg) and with stress classifications in resistance.

### **Methodological procedures**

Pierin; Jr [15] and Feldman [2] protocols were used to assess the blood pressure levels of each subject. Blood pressure was measure across the indirect method utilizing an aneroid sphygmomanometer apparatus of the mark Tycos (USA) and a Stethoscope of the mark Litemann Quality (German). Matsudo Protocol [16] was used to assess the physical activity levels and the Lipp protocol [17] to value the stress phase of each subject.

Data referents to stress and arterial hypertension levels were analyzed during three moments: pre (before of the first day of treatment); during (after the later day of the 4<sup>o</sup> week of treatment); and pos (after the later day of the 5<sup>o</sup> week of treatment to the TSP group and after later day of the 8<sup>o</sup> week of treatment to the PSP group).

Questionnaire that assessed the stress phase (Stress symptoms Declaration for Adults of Lipp) was composed to a questions grade divided in three questions subdivided of manner the following: 1A and 1B, 2A and 2B, 3A and 3B. First questions (A and B) are referents to symptoms that each subject has experimented in the 24 hour later. Symptoms undergone in week later are answered across the second question. Finally, third question describe the symptoms showed in the mouth later.

Passive stretching followed the protocol recommended for Dantas [10]. This protocol correspond the a ample and full stretch, carry out to support the posture of amplitudes large, no crossing the motion maximal limit, during a time of four to sex seconds. Dantas Protocol was realized during eight week, with assiduousness of

three times for week. Stretching therapy occurred the 8:00 hour, of made only (subjects look the motion realized to the therapeutic). Segments worked were: spinal cord, shoulder, elbow, wrist, leg and thigh joints.

To application of the Shiatsu therapy program, always attempted to harmonize the energies in need of balances, identified in the initial evaluation, manipulating all energetic canals and respecting the canals energetic sense.

Shiatsu therapy followed the protocol recommended for Cheesman et al. [18], performed once per week during five weeks the 8:00 hours. Were manipulated the upper body, low body, anterior and posterior trunk areas in each subject. Subjects were positioned to the investigator in the positions following: ventrally and dorsally lying downed and seated, in accord to the Kihon sequence, recommended to the Japan Imperial School/ KOHOIGAKU and to the Academia Brasileira de Artes e Ciência Oriental - RJ.

### **Statistical treatment**

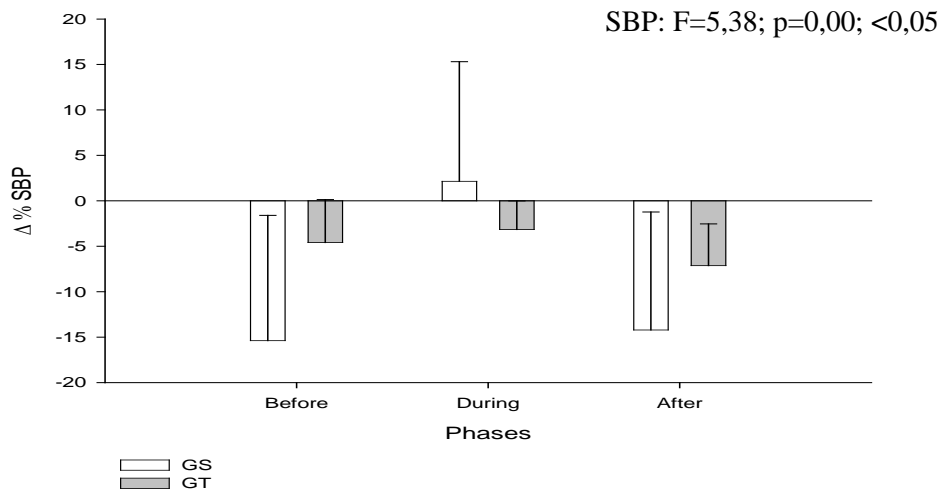
Data collected during the variables moments of this study were treated across statistic instruments of descriptive and inferential nature. Descriptive analysis, media and stand-deviation of the data collected in different stages were the references to analysis. Inferential statistics were used parametric and no-parametric tests. Variance analysis (ANOVA Three-way) model 2 x 3, concomitant with Post hoc test of Tukey, compared the occurred variations in the media of the dependence variables of each groups in all moments tested (blood pressure and stress phase: before x during x after). Statistic no-parametric using the Kruskal-Wallis test was utilized to compare the answers of the stress questionnaire. An alpha level of  $P > 0.05$  was considered statistically significant.

## **RESULTS**

Reductions significant ( $p < 0.05$ ) on the systolic blood pressure were observed in the passive stretching program (PSP) group after four weeks. However never differences occurred in the shiatsu therapy program (STP) group ( $p < 0.05$ ).

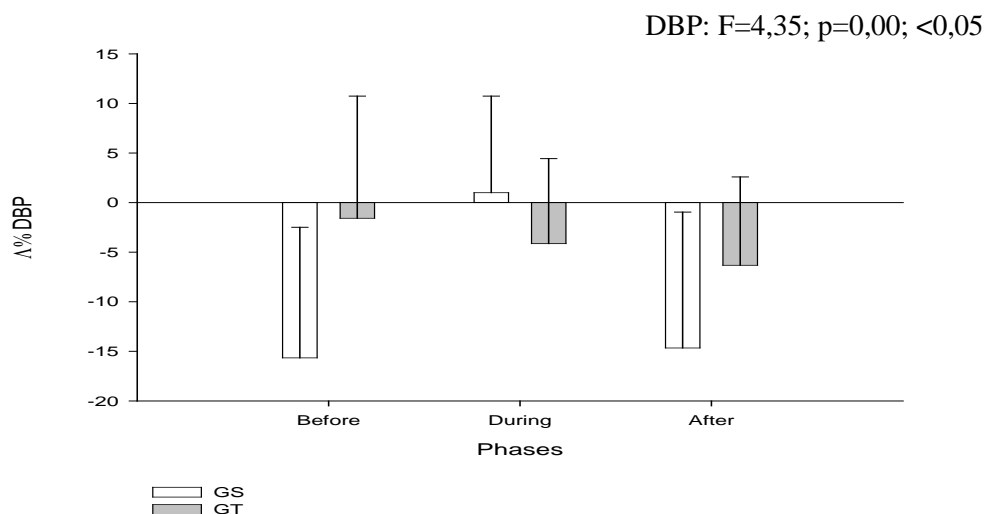
Media data between four and eight week of treatment showed large variations in the STP group ( $p > 0.05$ ) when compared to PSP group. Statistic data referents the systolic blood pressure of each group is showed in the graphic 1.

Graphic 1: % Variation of the SBP levels



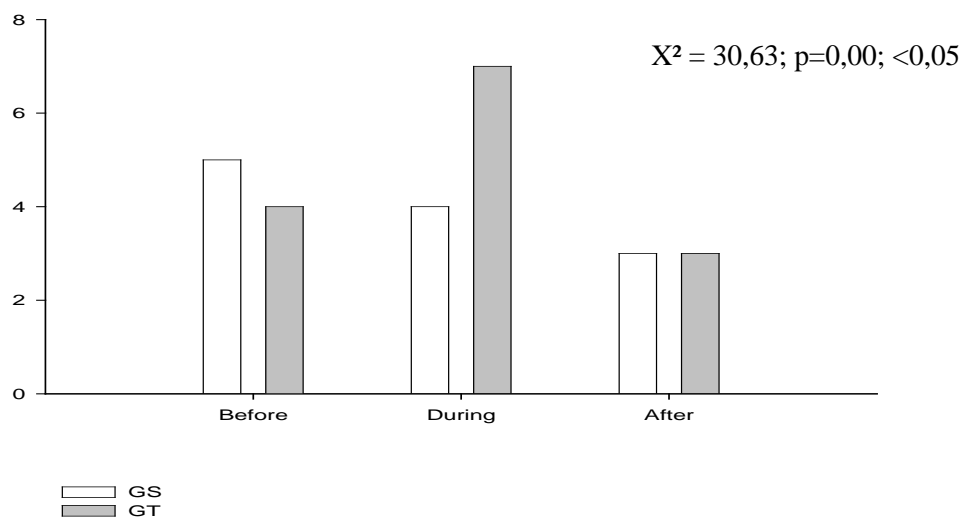
Variations are observed in the diastolic blood pressure between groups. Diastolic blood pressure presented reductions ( $P > 0.05$ ) after four weeks of treatment. Diastolic blood pressure showed little decrease ( $p > 0.05$ ) between the treatment of the four and eight week (graphic 2). Thus, statistic reveled differences between groups, showing that PSP group obtained improves results ( $p > 0.05$ ) to treatment end (graphic 1 and 2).

Graphic 2: % Variation of the DBP levels



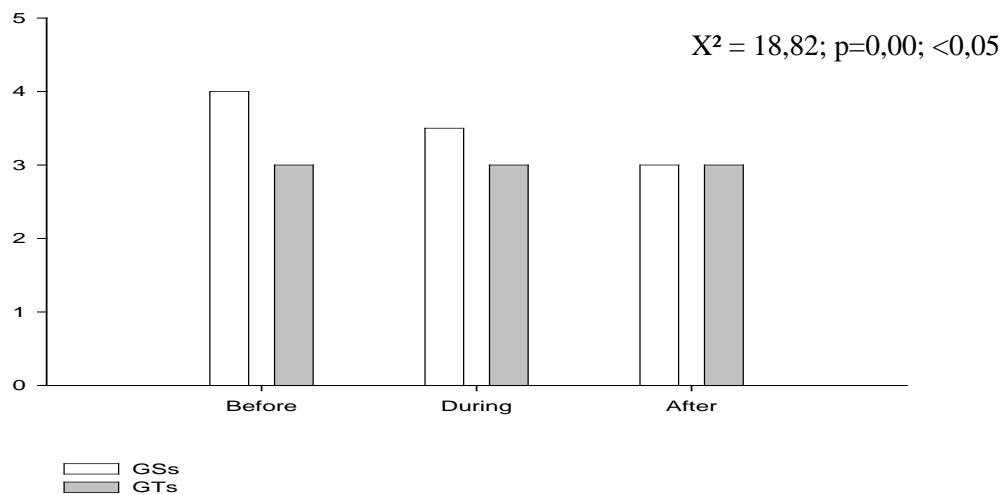
Graphic 3 exposed the blood pressure classifications. Results show that in media, prior of the treatment, subjects pertaining to passive stretching program (PSP) group were classified in the second stage (5) of hypertension, while the subjects pertaining to shiatsu therapy program (STP) group if found in the first stage (4). During the treatment if notified that the media of the PSP group decrease ( $p > 0.05$ ). However, STP group gone to systolic hypertension classification. Finally, later the treatment end, both groups obtained the classification of blood pressure normal elevated (3).

Graphic 3: Classification of the Blood Pressure levels



Stress classification presented to the subjects in before, during and after moments are plotted in the graphic 4. Beginning Treatment, PSP subjects showed classification in the exhaustion almost phase (4), while PTS group were classified in the resistance phase (3). During and after the treatment occurred most cases to resistance phase in both groups (3). No difference between groups was revealed comparing the answer of the stress questionnaire.

Graphic 4: Classification of the Stress levels



## DISCUSSION

As described prior, doubts strong exist on the arterial hypertension disease mechanisms and witch treatments types are effectiveness to its reduction. However, factors diverse are connected the etiologic of the arterial hypertension disease, such as sedentary, obesity, ageing, smoke, diabetes mellitus, work, socials and cultural factors and stress [7]. It is acknowledged that normal stress levels are essentials to survive [17]. Thus, elevated stress levels cause variables reactions unpleasant the health, conducting the lost of organic homeostasis. Based in this notion, present study fetched, across a scientific conception, investigate nearly the chronics effects of a passive stretching and shiatsu therapy program on the blood pressure and stress phase levels of hypertensions adults. The present study is the first to utilize the stretching technical versus shiatsu therapy program on the blood pressure and stress levels of hypertensions subjects.

After the data analysis, statistic showed that passive stretching program (PSP) group obtained most decrease in the variations of the systolic and diastolic blood pressure after treatment. The classifications of the blood pressure levels of the PSP group, prior, during and after of treatment, were classified in hypertension of second stage, hypertension of first stage and blood pressure normal elevated, respectively. On the other hand, shiatsu therapy program (STP) group, at the initial treatment



obtain the classification hypertension of first stage, going and, subsequently, establishing to classification systolic hypertension until the treatment end.

In accord to the studies on the passive stretching program as no-medicament intervention in treatment of the arterial hypertension disease, only a published scientific explanation [18] relate the positives effects. However the refereed study no support quantitative data. Between the positives effects of the passive stretching program, if detail some benefices, such as increase of the muscular relax and improve of the blood flow, caning so have contribution in the decrease of the blood pressure levels [10].

Lipp [17] relate that stress would be classified to questionnaire containing questions, varying in phases. The phases of the stress questionnaire of Lipp [17] are classified in: exhaustion phase (when the tension exceed the limit, having much anxiety and negative effect on the immunologic system); exhaustion almost phase (provoke graves disease, in exemplum, arterial hypertension disease); resistance phase (prolonged alert phase, when the organism operate a action to be economized energy) and alert phase (positive phase of the stress).

Between the terms presents in the stress questionnaire of Lipp [17], some has significant resulted, such as rate heart increased, change in appetite and hyper-ventilation. In treatment initial the PSP group found in exhaustion phase, going to resistance phase after the four week and, subsequently, establishing until the treatment end. In our study can be observed that the subjects with index large of stress classification have elevated arterial hypertension levels. This data confirm with the studies de Losyk [8], when to submit 2300 men the stress factors, evidenced that the total sample studied, 72% showed significant increase of the blood pressure levels, elevating the stroke risks of this subjects.

STP group no showed significant improves during all treatment in the variables systolic and diastolic blood pressure. However, occurred decrease only in the hypertension classification. The subjects pertaining to STP group was classified as hypertension to first stage in the initial treatment, going to systolic hypertension classification after the treatment. This data authentication, at least in part, with the studies Inagaki et al [18], of witch, the authors demonstrate that shiatsu therapy decreases only the values systolic of the blood pressure, no occurred reductions in the values diastolic of the blood pressure. However, Felhender; Lisander [20], showed in its experiments, that relax sessions can decrease the systolic and diastolic

blood pressure. The diminution of the blood pressure levels, observed during the treatment with shiatsu therapy, it is explained to the studies of Pernambuco et al. [21]. The referent authors relate that shiatsu therapy program modified the cortical wave activity of  $\beta$  (beta) to  $\alpha$  (alpha). In accord to Dantas [22], these modification causes a subjective sensation of relax, contributed to reduction of the blood pressure levels.

Several studies show that relaxes therapy programs can be as rich as treatment of medicaments intervention, realized across drugs anti-hypertension, principally because the stress, anxiety and rate heart decreased. However, in our study have not variations in the stress levels during all treatment of the STP group.

Shuman; Hirsh [23] investigated the most provable causes of the stress, but no classifying. Thus, all causes found are presented in the Lipp questionnaire [17]. The author cite some symptoms, such as, emotional tension, anxiety, fear, affliction and depression, in witch each answer may have a devastator effect in body, comprising the heart system with diseases variables. The present study showed that answer of the stress questionnaire has no differences. However, several subjects related the same symptoms described above.

Jacobson [11] relate that physical tension or stress provoke different effects in organisms distinct, in accord to a living situation. Subjects that have stress revel that undergo head pain, asthma, gastric and intestinal perturbations, or still, blood pressure elevated. Subjects this study accounted fell similar symptoms, such as pain in the stomach, nausea, needless in respire.

The physical inactivity also does have direct relation with increase of the blood pressure levels. It is acknowledged that sedentary compartmental conduct is a factor of risks to cardiovascular disease [2,12,13]. In accord to Puppin [24] a sedentary lifestyle is strongly associated to mortality enhanced, pretension to coronary diseases and arterial hypertension disease. However, subjects of both groups (STP and PSP) were sedentary, so, contributing to the increased levels blood pressure.

Blumenthal et al. [25] recommend begin the anti-hypertensive therapy with no-medicaments intervention, across physical exercises. Thus the treatment with exercise lack, must immediately utilize drugs in the anti-hypertensive treatment or after twelve-four weeks of no-medicament intervention without improves. All subjects of this study were sedentary and do used regularly of anti-hypertensive drugs. In accord to the authors, is recommended apply this therapy with accompaniment of a

doctor in peoples sedentary and with diagnostic of arterial hypertension disease in the first and second stage. Therefore reducing, or maybe, retiring the dosage of the drug ingested.

Based in these results, it concludes that passive stretching obtained improves outcomes in all variables evaluated, principally when compared the shiatsu therapy. In front this data, it is recommended immediate intervention of sedentary subjects in witch present arterial hypertension and relates symptoms, such as hyperventilation, lost or change of the appetite and accelerated rate heart.

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