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Practical effect of walking on the Hemodynamic profile of olderly people in Congo-Brazzaville

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Elderly, cardiovascular values, physical activity

A B S T R A C T

To assess the impact of physical activity on administrative environment on the health of older people in Congo Brazzaville. This longitudinal study of comparative type was conducted on 60 subjects divided into two groups: 30 walkers (including 15 women and 15 men of the club of walkers Diata district of the city of Brazzaville Congo) and 30 sedentary. Their average age was 51.00 ± 6.36 years respectively for men and 52.86 ± 6.03 years for women. All subjects had a practice of duration of physical activity and sport (power walking) at least one (1) year s with two (2) sessions per week. The biometric parameters (height, weight, body mass index, the adbomen-hip ratio), clinical (heart rate and blood pressure) were evaluated. The values were compared between the two groups: practicing physical and sedentary activity. Reduction in weight in patients practicing physical activity was observed compared to sedentary with values of 70.13 ± 6.38 kg versus 72.93 ± 7.67 kg for men and 70.93 ± 11.29 kg vs 78.4 ± 16.49 kg for women, the abdomen-hip ratio was not significant between groups. Similarly, a decrease in blood pressure and resting heart rate was observed in patients (men and women) practicing walking compared to sedentary subjects with values of blood pressure (systolic and diastolic) from 121.33 ± 10.72 versus 133, 26 mmHg; 86.53 ± 12.79 versus 87.46 ± 13.61 mmHg and heart rate 78.20 ± 11.87 versus 73.86 ± 8.62 bpm for men. As the values of blood pressure (systolic and diastolic blood pressure) of 120.20 ± 9.84 vs 130.46 ± 15.17 mmHg for systolic blood pressure; 78.80 ± 9.34 versus 90.60 ± 16.17 mmHg diastolic blood pressure and heart rate 80.13 ± 12.60 versus 81.93 ± 10.90 bpm in women. A rational and regular practice of running in the elderly has beneficial health effects: body composition and its hemodynamic profile.

Introduction

The advancing age induces several structural and functional changes in the cardiovascular system (Lakatta, 2003). In fact, regular exercise has undeniable beneficial effects for health in general and the cardiovascular system in particular. However, the growing number of older people worldwide is a major public health challenge to improve health outcomes in populations âgéesen turning to therapy exercise (Thompson *et al*., 2001). A particular concern in the elderly is the development of frailty associated with cardiovascular diseases. Moreover, advancing age is accompanied by a deterioration in the ability to long-term exercise (aerobic system) and the ability to exercise at high intensity (anaerobic pathway) (Astrand *et al*., 1973).

Physical activity contributes significantly to cardiovascular health. Primary and secondary preventive effects are generally obtained through regular endurance sports at a moderate intensity (Matthias Wilhelm, 2011). Very intense endurance sports and very prolonged reactions lead to structural adaptation of the heart and an increase in performance. Physical activity prevents a number of deleterious processes related to aging (Blain *et al*., 2000). It reduces the decline linked to advancing age of physical fitness that is limited by the reduction of the maximum heart rate, and reduced the incidence of vascular disease by preventing and reducing the effect of vascular risk factors.

However, previous studies have shown that this gradual and steady decline of age in progress can be minimized by training. Aerobic training is an essential component of cardiac rehabilitation programs, and had been associated with improved cardiovascular performance submaximal and maximal, even in the elderly. Even a training program of moderate intensity exercise, if followed regularly, with favorable effects on several health outcomes, if tailored to the clinical and functional status or preference of the elderly patient (Vigorito *et al*., 2003).

In today's society, older people with cardiovascular problems (blood pressure, overweight) advanced in years focuses on pharmaceutical products for survival. Congo Brazzaville and in other countries of Black Africa, the practice of physical activity maintenance in the elderly is far less known.

This study aims to assess the effects of walking on cardiovascular parameters of the Congolese elderly.

Material and Methods

This study, comparative longitudinalede kind took place in Brazzaville (Congo) to the stadium Alphonse Massamba DEBATE center for rehabilitation and cardiovascular rehabilitation (Fitness) from 15 February to 4 April 2015. It involved 30 subjects practicing physical activity and regular sports and 30 sedentary healthy subjects. Their age was between 45 and 60 years with an average age of 54.62 ± 0.7 years for both sexes (male and female). The target population consisted of government officials (state) of Congo Brazzaville. Only individuals with a term of one (1) year of participation in physical activity and sport, without pathology; and the subjects practicing any sport and physical activity (sedentary) in good health were the subject of this study. Inclusion criteria were: age over 45 and under 60 years old, have high blood pressure not exceeding 150 mmHg. Exclusion criteria were: be aged under 45 and over 60, have critical values of blood pressure. The objectives of the study were

explained to each subject and the subsequent use of the data.

Experimental Procedure

Measurements of the size (measured at 0.5 cm) Weight (estimated at 0.1 Kg close) were performed before the study. Body mass index (BMI) was calculated by the ratio (weight (kg)) / (Height (m)) 2. The hip circumference and abdomen were measured using a meter ribbon.

The heart rate (HR) in beats per minute (bpm), was measured using a portable heart rate monitor (Polar Trainer more × TM) storing beats every 5 seconds. The system corresponding to a sensor placed around the torso by means of a belt and a watch -shaped receiver fixed around the wrist. Finally, pression artérielle was measured in the right arm with a sphygmomanometer Digital Display (pbiodex, St Paul, Minnesota, USA). All values were obtained at rest

Variables Studied

The variables studied in this work were : weight, body mass index , the abdomen - hip ratio , heart rate , systolic blood pressure (No) and diastolic blood pressure (Pad).

Statistical Analysis

All statistical analyzes as described below were performed using SPSS software (version 21, SAS Institute, Cary, NC). Means and standard deviations were used for all variables of the study. To determine whether the practice of walking had an effect on the anthropological parameters and cardiovascular profile, we had to make a t-test for dependent sample to determine differences between groups. The confidence level was set at 95% and accounted for 5% significance level for all statistical tests ($p < 0.05$).

Results and Discussion

Anthropometric measurements in age, height and weight of men practicing physical activity and sedentary were 48.33 ± 2.89 years, respectively, versus 51.00 ± 6.36 years; 1.71 ± 0.06 m versus 1.71 ± 0.09 m and 70.13 ± 6.38 kg versus 72.93 ± 7.67 kg and that of practitioners and non practitioners women were 52.86 ± 6.03 years vs 51.53 ± 9.15 years, 1.63 ± 0.08 vs 1.54 ± 0.43 m and 70.93 m ± 11.29 kg vs 78.4 ± 16.49 kg (table 2) . These variables studied, no significant differences were observed among practicing men and women walking compared to sedentary.

The values of systolic blood pressure were 121.33 ± 10.72 versus 133.26 mmHg while those in diastolic blood pressure were 86.53 ± 12.79 versus 87.46 ± 13.61 mmHg and for the heart rate 78.20 ± 11.87 versus 73.86 ± 8,62bpm. For men or not practicing sport and physical activity.

The values of systolic blood pressure were 120.20 ± 9.84 vs 130.46 ± 15.17 mmHg; diastolic blood pressure 78.80 ± 9.34 versus 90.60 ± 16.17 mmHg and the heart rate 80.13 ± 12.60 versus 81.93 ± 10.90 bpm for women practicing physical activity and athletic and sedentary.

Characteristics of Subjects

The present study included men and women practicing sport and physical activity (walking) and sedentary whose average weight was 70.13 ± 6.38 kg , respectively vs. 72.93 ± 7.67 kg and 70 93 ± 11.29 kg vs 78.4 ± 16.49 kg . A significant difference in weight was observed between men and women practicing physical activity and

sedentary . It is often shown that regular physical activity has an effect on body weight (Casa *et al*., 2000). In view of these results, it is therefore reasonable to think that men and women practicing sport embedded in this sample have a low training level.

Cardiovascular Profile Settings

Men and women practicing sport and physical activity (walking) who participated in this study saw their performance in systolic blood pressure and diastolic blood pressure decrease compared to sedentary. Given these results, several studies have shown the beneficial effect of the practice of physical activity on systolic blood pressure (SBP) and diastolic blood pressure (DBP). These researchers believe that blood pressure during physical and sports activities will depend on the characteristics of the activity (Mitchell *et al*., 1994). For an endurance activity (effort "dynamic"), arteriolar vasodilation during the warm-up will decrease peripheral resistance and contribute to a decline in PAD, the rise in blood pressure during the following year will be moderate and progressive for PAS, and discrete or no to the PAD. At the end of the year, there is a post-exercise hypotension (HPE) (Mitchell *et al*., 2013), which continues on average up to 22h after the exercise session. It is about 8/9 mm Hg (SBP / DBP) in normo tense, 14/9 mmHg in pre-hypertensive and 10/7 mmHg in hypertensive patients treated. (MacDonald, 2002) The specific benefit of the HPE is unknown; its duration, the same as a sustained-release drug, contribute to chronic hypotensive effect in case of repetition of the sessions. (Hecksteden *et al*., 2013) Similarly structured program of physical activity reduces blood pressure in hypertensive patients, an average of 11 mmHg for systolic blood pressure and 8 mmHg for diastolic pressure. It allows you to delay, or even render useless, drug treatment of hypertension in newly diagnosed.

Genetic and environmental factors may influence changes in arterial blood pressure during a physical training program . (Rice *et al*., 2002) This dimension is poorly understood because little studied. However, it is noteworthy that the hereditary component in the adaptation of blood pressure in a 20-week endurance training appeared as low systolic pressure and heart rate (17-30 % reduction) and negligible diastolic pressure. In short , the practice of physical activity is now considered an essential part of the care of patients with hypertension .

Table.1 Anthropometric Measurements

Variables	Men (n = 30)		Women (n = 30)	
	Hom_Prat (n = 15)	Hom_Prat pas (n = 15)	Fem_Prat (n = 15)	Fem_Prat pas (n = 15)
Age (an)	48,33 ± 2,89	51,00 ± 6,36	52,86 ± 6,03	51,53 ± 9,15
Cut (m)	1,71 ± 0,06	1,71 ± 0,09	1,63 ± 0,08	1,54 ± 0,43
Weight (kg)	70,13 ±6,38	72,93 ± 7,67	70,93 ± 11,29	78,4 ± 16,49
IMC(kg/m2)	25,7±3,5	26,30±4,6	26,25±3,2	27,14±5,18
RAH	1,1±0,1	1,3±0,3	1,5±0,2	1,7±0,4

Hom_Prat : Men practicing sport; Hom_Prat not : Men do not practice sport; Fem_Prat : Women practicing sports; Fem_Prat not : Women not practicing sport, BMI : Body Mass Index , RAH : Abdomen - hip Report

Table.2 Change parameters of the cardiovascular profile

Variables	Men (n = 30)		Women(n = 30)	
	Hom_Prat (n = 15)	Hom_Prat pas (n = 15)	Fem_Prat (n = 15)	Fem_Prat pas (n = 15)
PAS (mmHg)	121,33 ± 10,72*	133,26 ± 13,61	120,20 ± 9,84*	130,46 ± 15,17
PAD (mmHg)	86,53 ± 12,79	87,46 ± 13,99	78,80 ± 9,34*	90,60 ± 16,76
FC (bpm)	78,20 ± 11,87	73,86 ± 8,62	82,13 ± 12,60	80,93 ± 10,90

Hom_Prat : Men practicing sport; Hom_Prat not : Men do not practice sport; Fem_Prat : Women practicing sports; Fem_Prat not : Women not practicing sport; *: Significant difference between the male practitioners and non- practitioners and between practitioners and non-practitioners women (P <0.05)

We can say that the results obtained in this study on cardiovascular values (SBP and DBP) are consistent with those of the literature and reflect the practice of physical activity (walking).

The values of the resting heart rate showed a non-significant difference either in men or women (p = 0.263 for men and p = 0.679 for women). Although the values observed in men and women are in the standards, it allows to say that the practice of physical activity (walking) to a non-significant effect on heart rate of the subjects of the study. Comparative previous studies of heart rates of athletes over 55 years and sportsmen of 15-25 years have shown that heart rate was the same at rest. In addition, they increase during exercise and then three minutes after the effort they descend almost to the value of rest and during exercise, the mean heart rate of athletes of these two age groups do not exceed 120 beats / min (Manon *et al*., 2008-2009). Moreover by comparing heart rate of athletes and sedentary, they find that the average heart rate of sedentary is always higher than that of subjects trained at rest for 3 minutes after exercise. Moreover, during exercise, average heart rate exceeds 120 beats sedentary / min can reach 130 beats / min. Our results corroborate those in the literature with weak Manon *et al* values. (2009), this is due to the intensity, volume of work and the tempsde practice of physical activity and sport.

Conclusion

This study's main objective was to evaluate the effect of the practice of walking on the cardiovascular profile of people aged over 45 years. The practice of sport walking showed significant differences in systolic blood pressure and diastolic blood pressure in men and women. By cons, changes in body weight and heart rate were no differences between the two groups.

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