SHORT COMMUNICATION
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Physical activity practice during COVID-19 pandemic in patients with intermittent claudication

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SUMMARY

OBJECTIVE: To describe physical activity habits and barriers for physical activity practice in patients with peripheral artery disease and claudication symptoms during Coronavirus 2019 (COVID-19) pandemic.

METHODS: In this cross-sectional survey study, 127 patients with peripheral artery disease (59.8% men; 68±9 years old; and 81.9% had the peripheral artery disease diagnosis ≥5 years old) were included. The physical activity habits and barriers for physical activity practice were assessed through telephone interview using a questionnaire with questions related to: (a) COVID-19 personal care; (b) overall health; (c) physical activity habits; (d) for those who were inactive, the barriers for physical activity practice.

RESULTS: Only 26.8% of patients reported practicing physical activity during the COVID-19 pandemic. Exercise characteristics more common among these patients include walking, performed at least 5 days a week, during 31–60 min at light intensity. In contrast, among physically inactive patients, pain, injury or disability (55%), the COVID-19 pandemic (50%), the need to rest due to leg pain (29%), and lack of energy (27%) were the most frequent barriers to physical activity practice.

CONCLUSION: The physical activity level of patients with peripheral artery disease is impacted by the COVID-19 pandemic.

KEYWORDS: Coronavirus infections. Social isolation. Intermittent claudication. Exercise.

INTRODUCTION

Peripheral artery disease (PAD) is a prevalent condition in the elderly population[1] and that frequently is associated with several comorbid conditions, including hypertension, diabetes, coronary artery disease, and obesity[2]. In patients with PAD and claudication symptoms, function capacity is reduced, bringing aggravating the symptomatology and other comorbid conditons[3,4].

Physical activity practice is considered a cornerstone of clinical treatment in patients with PAD and claudication symptoms. However, most of the patients do not achieve the minimum of physical activity levels recommended by general and specific guidelines (i.e. 150 min/wk of moderate-vigorous physical activities)[5]. Most of the reasons for physical inactivity in these patients include claudication symptoms, difficulty in having

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places to physical activity practice, fatigue, and the presence of other diseases[6-8]. In the early of 2020, the world faced an outbreak of the novel coronavirus disease, later called COVID-19, and on the 11th of March 2020, COVID-19 was characterized by World Health Organization as a pandemic[9,10]. The social isolation and mobility restrictions adopted to reduce the virus spread have reduced physical activity levels in all age groups. This is even worse in high-risk groups for COVID-19, which includes elderly patients and people with chronic diseases[11,12].

In patients with PAD, the impact of COVID-19 on the practice of physical activity was not described, which limits the understanding of the magnitude of the problem and proposes strategies to cope with physical inactivity in these patients. This study aimed to describe physical activity habits and barriers to physical activity in patients with PAD and claudication symptoms during the COVID-19 pandemic.

METHODS

Study design and patients

This observational, descriptive cross-sectional survey study involved patients with PAD and claudication symptoms recruited from the database of researches previously developed by our group. This current study was approved by the local ethical committee before data collection (CAAE #31529220.8.0000.5511). Participants did not identify themselves and their answers were only included in the sample if they authorized it before the protocol started. All procedures follow the national legislation and the Declaration of Helsinki.

Patients were included if they met the following criteria:

a) agreed to participate and respond to all questions of the survey;
b) the previous diagnosis of PAD;
c) age ≥45 years old;
d) had ankle-brachial index (ABI) ≤0.90 in one or both legs, and;
e) absence of non-compressible vessels, amputated limbs and/or ulcers.

Patients were only excluded if they presented some disability during the phone call that compromises the answer to the questionnaire (i.e. cognitive, hearing, and speech).

Data collection

Data collection was performed through a phone interview, between May 15 and August 10, 2020, conducted by health professionals with experience in studies with patients with PAD.

The evaluation of the impact of COVID-19 on the practice of physical activity of patients with PAD was assessed through a questionnaire developed by researchers of the study. The questionnaire was composed of the following questions:

Personal information: was accessed by our database including info about sex ("woman" or "man"), date of birth (DD/MM/YYYY), time of PAD diagnosis (in years), body mass index (kg/m^2) and PAD severity (ankle-brachial index).

COVID-19 personal care: involved questions about the recommendations of personal care during the Covid-19 pandemic and about COVID-19 diagnosis. 1. "Are you in social isolation?", 2 – "Were you diagnosed with COVID-19?" If yes, 3 – "Have you recovered?" Possible answers: "Yes" or "No".

Overall health: This domain assesses the presence of diagnosed diseases and health behavior. From the list of diseases, the participant should report all that applied. (possible answers: Hypertension, diabetes, high cholesterol, high triglycerides, cardiopathy, respiratory disease, or other). It was also questioned "Do you smoke" Possible answers: "yes" and "no".

Physical activity: To assess physical activity habits, participants were asked about: 1- "Did you practice physical activity before the pandemic?", 2- "Are you performing some physical activity?" Answers for both questions were "Yes" or "No". If yes, 3 – "How many times are you exercising a week? (possible answers: one to seven days a week), 4 – "For how long are you exercising?" (possible answers: "less than 30 min", "between 30 and 60 minutes", and, "more than 60 minutes"), 5 – "What is the intensity of the physical activity?" (possible answers: low, medium/moderate or high), 6 – "What type of exercise are you doing?" (possible answers: "walking/jogging", "functional exercise", "resistance exercise", "I am not exercising", "others – open question".

Barriers to physical activity: For patients who were not exercising, it was questioned "Which of the following are the main reasons for you NOT to practice physical activity?" From the list of barriers, the participant should report all that applied. (possible answers: "COVID-19 pandemic", "some difficulty in getting to place", "weather unfavorable", "lack of company", "pain", "injury or disability", "needing to rest because of leg pain", "lack of physical energy", "being afraid of hurting", "lack of time", "lack of knowledge", or "other").

Statistical analysis

Data were stored and analyzed using the Statistical Package for the Social Sciences (SPSS Version 20.0). Normality and homogeneity were analyzed, and parametric statistical procedures were employed. Continuous variables were summarized as mean and standard deviation, whereas categorical variables were summarized as relative frequencies.

RESULTS

The sample included 127 patients with PAD (Table 1). Patients were mostly elderly, with comorbid conditions, including hypertension (84%), dyslipidemia (80%), cardiac disease (52.8), and diabetes (46%) The majority of patients were in social isolation (89%) and three of them were infected with full recovery of COVID-19.

Table 2 shown the physical activity habits in patients with PAD. Fifth-four percent of patients reported physical activity practice before the COVID-19 pandemic and during the pandemic the number of patients reporting some physical activity practice reduced to 26.8%. Among patients that remained physically active, the more common modality was walking exercise (58.8%), performed at least 5 days a week, during 31–60 min at light intensity.

Table 3 shown the barriers to physical activity in inactive patients with PAD (n=93; 73%) during the COVID-19 pandemic. The most frequent barrier to physical activity practice was pain, injury or disability (55%), the COVID-19 pandemic (50%), the need to rest due to leg pain (29%), and lack of energy (27%).

Table 1. Clinical characteristics, co-morbidities and COVID-19 conditions of the patients with peripheral artery disease (n=127).

	Values
Gender (male), n (%)	76 (59.8)
Age, years	68±9
Body mass index, kg/m²	27.4±4.2
Ankle-brachial index	0.54±0.17
Time of disease since diagnosis, n (%)	
<5 years	23 (18.1)
5–10 years	55 (43.3)
>10 years	49 (38.6)
Comorbidities and risk factors, n (%)	
Smoker	19 (15.0)
Former smoker	80 (63.0)
Diabetes mellitus	58 (45.7)
Hypertension	106 (83.5)
Dyslipidemia	102 (80.3)
Obesity	29 (22.8)
Cardiac disease	67 (52.8)
Respiratory disease	20 (14.6)
Regarding COVID-19, n (%)	
Social isolation	113 (89.0)
COVID-19 diagnosis	3 (2.4)
Recovered from COVID-19*	3 (100)

Data presented as mean±standard deviation, and as absolute and relative frequency. *n=3

Table 2. Physical activity habits in patients with peripheral artery disease (n=127).

	Values
Physical activity habits (n=127)	
Physical exercise before COVID-19	69 (54.3)
Physical exercise during COVID-19	34 (26.8)
Characteristics of Physical exercise currently (n=34)	
Modalities	
Walking exercise	20 (58.8)
Functional exercise	13 (38.2)
Resistance exercise	3 (8.8)
Frequency (x/week)	
1–2	6 (17.6)
3–4	9 (26.5)
5–7	19 (55.9)
Duration (min)	
≤30	9 (26.5)
31–60	19 (55.9)
≥61	6 (17.6)
Intensity	
Light	17 (50.0)
Moderate	14 (41.2)
Vigorous	3 (8.8)

Table 3. Barriers to physical activity in sedentary patients with peripheral artery disease (n=93). Data presented as absolute and relative frequency.

	Values
COVID-19 pandemic	46 (49.5)
Some difficulty in getting to place	8 (8.6)
Weather unfavorable	3 (3.2)
Lack of company	2 (2.2)
Pain, injury or disability	51 (54.8)
Needing to rest because of leg pain	27 (29.0)
Lack of physical energy	25 (26.9)
Being afraid of hurting	15 (16.1)
Lack of time	6 (6.5)
Lack of knowledge	2 (2.2)
Others	12 (12.9)

DISCUSSION

The main results of this study were:

(i) the number of PAD patients who reported physical activity practice reduced more than half during the COVID-19 pandemic;

(ii) among physically inactive patients, the most reported barrier to physical activity practice were pain, injury or disability, the COVID-19 pandemic, lack of energy and the need to rest because of leg pain;

(iii) among patients that remained active, walking exercise, 5 days a week, during 31–60 min at light intensity were the most frequently reported.

Patients with PAD and symptoms of claudication are less physically active than age-matched controls[5], with few of them achieving the general recommendation to physical activity for the elderly (150 min/wk of moderate-vigorous physical activities). In the current study, 56% of patients reported performing some physical activities before the COVID-19 pandemic, which was reduced to only 27% during the COVID-19 outbreak. Given that physical activity can promote overall health benefits in patients with PAD[13-15], our results raising the attention to highlight the urgent need to stimulate physical activity during periods of mobility restrictions. Among patients who were not practicing physical activity during the COVID-19 outbreak (73%), the main barriers during COVID-19 to physical practice include pain, injury or disability, the COVID-19 pandemic, lack of energy, and the need to rest because of leg pain. Most of these barriers have been frequently reported in patients with PAD claudication[6-8] and are related to the symptoms of the disease, the presence of the comorbid conditions, and lack of motivation and energy. Moreover, the COVID-19 pandemic is now included in this hall, adding a new difficulty to patients become physically active, which was probably caused by the social isolation and mobility restrictions. Adherence to these recommendations is important in patients with PAD since they are considered a high-risk group. In this context, strategies to minimize claudication symptoms and avoid social contact could be useful to overcome the reported barriers.

Among patients who remained physically active during the COVID-19 pandemic, walking was the most frequent mode of exercise, performed at least 5 days a week, during 31-60 min at light intensity. This physical activity pattern of the patients follows the current general and specific recommendations, except for intensity that ha been recommended in moderate to vigorous activity[16]. The preference to not perform moderate and vigorous physical activities have been widely reported in patients with PAD and has been attributed to the anticipation of claudication pain. Interestingly, in the elderly population, light-intensity physical activities have been associated with improvements in several health outcomes[17,18], and the potential health benefits in PAD patients must be investigated in the future.

Previous studies[19,20] have shown the potential of home-based walking programs to improve walking capacity and quality of life in patients with PAD. However, walking in the neighborhood during the COVID-19 pandemic can be problematic for patients, and other alternatives could be necessary. Homebased functional exercises have shown important results in the elderly and can be useful for patients with PAD, especially for promoting less pain during the exercise, which can increase adherence to the practice. The use of mobile apps, videoconferences, and other technologies could also be useful to improve physical activity levels in patients with PAD. However, their feasibility and effectiveness should be tested.

This study presents limitations that should be emphasized, the main one is the use of self-reported assessments that are susceptible to information bias. To avoid direct contact with patients, the assessments were performed using phone calls, which impose additional difficulties in obtaining information. The recruited sample is part of previous studies of our group, and whether the results can be expanded to the general population is unclear.

CONCLUSION

The physical activity level of patients with PAD is impacted by the COVID-19 pandemic. Remote strategies to perform physical activity avoiding claudication symptoms could be useful to increase their physical activity levels during this period.

AUTHORS' CONTRIBUTIONS

RMR: Conceptualization, Formal Analysis, Writing – Original Draft, Writing – Review & Editing. **MAC:** Conceptualization, Formal Analysis, Writing – original draft, Writing – Review & Editing. **NW:** Conceptualization, Writing – Original Draft, Writing – Review & Editing. **GGC:** Conceptualization, Formal Analysis, Writing – Original Draft, Writing – Review & Editing. **HK:** Conceptualization, Formal Analysis, Writing – Original Draft, Writing – Review & Editing. **MDO:** Data Curation, Formal Analysis, Writing – Original Draft, Writing – Review & Editing. **JFC:** Data Curation, Writing – Original Draft, Writing – Review & Editing. **HAB:** Data Curation, Writing – Original Draft, Writing – Review & Editing.

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