Regular Dog-Walking Improves Physical Capacity in Elderly Patients after Myocardial Infarction

Ružić, Alen; Miletić, Bojan; Ružić, Tatjana; Peršić, Viktor; Laškarin, Gordana

Coll. Antropol. **35** (2011) Suppl. 2: 73–75
Original scientific paper

Regular Dog-Walking Improves Physical Capacity in Elderly Patients after Myocardial Infarction

Alen Ružić[1,2,3], Bojan Miletić[1,2], Tatjana Ružić[4], Viktor Peršić[1,2,3] and Gordana Laškarin[1,2]

[1] Clinic for Cardiovascular Disease Treatment, Prevention and Rehabilitation, Hospital Thalassotherapia Opatija, Croatia
[2] School of Medicine, University of Rijeka, Rijeka, Croatia
[3] School of Medicine, University »J. J. Strossmayer«, Osijek, Croatia
[4] Psychiatric Hospital Rab, Rab, Croatia

A B S T R A C T

Various positive effects of pet ownership on cardiovascular health are well known. The aim of this prospective and controlled longitudinal study was to determine the effects of everyday dog-walking on physical capacity in elderly patients during the first year after myocardial infarction. Regularly dog-walking for at least 15 minutes three times a day is related to significantly higher work load on the bicycle exercise test (72.5 ± 10.75 versus 67.6 ± 11.6 W, $p<0.05$) in the »dog-walking« group (N=29, mean age 72.5 years) at 12 months compared to the control group (N=30, mean age 71.7 years). Our results suggest that dogs may help to maintain continuous physical activity in elderly cardiovascular patients promoting their physical capacity. Further researches are needed to confirm this association as well to identify other possible influences of dog ownership on the cardiovascular health and on the outcome in patients after myocardial infarction.

Key words: *elderly, dog-walking, animal-assisted therapy, physical capacity, myocardial infarction*

Introduction

Cardiovascular diseases remain the leading cause of overall mortality in many developed countries despite the progress of treatment achieved over the past decade[1]. The ageing of the population represents one of the most important causes of cardiovascular diseases high prevalence which is continuously raising a number of new important issues and priorities in the treatment of those patients[2]. The regular physical activity significantly reduces the major components of the cardiovascular risks. It improves the spontaneous regulation of the blood pressure and the heart rate, positively affects the glycemic control and the lipid profile, also suppressing the endothelial dysfunction and the generalized low-grade inflammation that both plays a key role in prognosis and development of the coronary artery disease[3–5]. In according to these findings, the regular physical activity has become an integral part of the primary and especially of the secondary cardiovascular prevention[1]. At the time, we are also aware that among other factors dog ownership can be strongly related to the regularity of the physical activity. Regardless this important feature of animal owning, the pet's influence on the health status can be also mediated through different other mechanisms of action[6]. Despite the fact that owning and taking care of dogs is nowadays recognized as the simplest form of animal-assisted therapy (AAT), there is very little data on the role of this effective, widely available and safe health-promoting habit [on] patients with established coronary artery disease[2,3,6]. The aim of this study was therefore to investigate the influence of regular dog-walking on the physical capacity in patients after myocardial infarction.

Materials and Methods

Patients

In this 12-months longitudinal prospective and controlled study we included fifty – nine male patients 4 weeks after the onset of the myocardial infarction. Examinees were divided in two groups: the intervention group of 29 dog-owners (mean age 72.5 years) that underwent regular dog-walking for at least 15 minutes

Received for publication July 07, 2011

three times a day and the control group consisted of 30 male patients comparable in age (mean age 71.7 years) that underwent regular daily walk of 30 minutes. The standard Bruce bicycle-ergometry test was performed at the beginning and at the end of the study. During the trial, all patients received the standard medicamentous therapy.

Statistics

We used Statistica software for the analysis and the interpretation of results. The level of significance was set at $p<0.05$.

Results

At the beginning of the study, the »dog-walking« group expressed higher levels of workload compared to the control group. Both groups better tolerated the physical exertion at the end of the follow up. However, the maximal workload at the final stress-test was significantly higher in the »dog-walking« group (72.5±10.75 versus 67.6±11.6 W, p<0, 05). The maximal heart rate and the maximal blood pressure during the ergometry test were not significantly different at the beginning and at the end of the investigation. The results are presented in the Table 1.

Discussion

Our results indicate significant improvement of functional cardiac capacity in both tested groups underlining the importance of regular daily physical activity. The higher cardiac capacity in dog-walking group suggests the additional positive long-term effects of dog-ownership on the cardiovascular health status. However there is a paucity of data in this important field, regular short hikes seems to be associated with significantly better functional capacity one year after the myocardial infarction. As the improvement is significantly higher in the dog-walkers group, the difference is suggestible to be dependent on the dog-related frequent walking. Other possible causes of this difference have to be tested, primarily those from the field of psychological effects related to the pet-ownership. Our results are consistent with previous findings that exercise training has positive effects on myocardial perfusion and on the improvement of endothelial dysfunction in patients with coronary artery disease[7,8].

During our study, we did not find significant changes of the maximal systolic blood pressure and the maximal heart frequency in the groups and between groups. However, higher workload combined with unchanged reactivity of blood pressure and heart frequency is strongly suggestive of improved functional capacity, especially in the dog-walking group. The AAT has become nowadays one of the accepted and endorsed methods in the treatment of different medical conditions such as mental diseases, child cerebral palsy, Alzheimer's disease, dementia, Parkinson's disease, rheumatoid arthritis and AIDS[9–11]. We also know that AAT have many psychological benefits – it promote the feeling of self-worth, reduce anxiety; provide better social contact and the feeling of being needed, especially in the elderly[12]. The dolphin therapy, horse therapy and dog-assisted therapy are improving the quality of life and adaptation to the illness in children[13,14]. The studies have shown that regular dog-walking reduces systolic blood pressure in dog owners compared to non-owners, lowers triglycerides and cholesterol plasma concentrations[15]. Rehabilitation programs that included the dog-assisted therapy for patients with chronic heart failure showed to decrease the hospital length of stay and almost doubled the walking distance capacity[16]. However, the AAT is still not sufficiently applied in the patients with coronary artery disease[17] and it is poorly investigated in the elderly nevertheless they represent the fastest growing population group in developed countries with high cardiovascular diseases prevalence[1,10]. Cardiac rehabilitation programs in elderly shows some important specificity respecting comorbidity and significant functional limitations. They require multidisciplinary approach, interventions in the cognitive and emotional fields and adapted methods of physical exercise with the possibility of alternative rehabilitation programs implementation[18–20]. The physical activity during cardiac rehabilitation in elderly showed different positive effect on the flexibility, balance and coordination that can be especially important regarding the comorbidities and the long-term outcome[20,21]. Despite exercise training remain key components of cardiac rehabilitation program[22] with positive effect of on cardiovascular health outcomes[23], cardiac rehabilitation programs are still underutilized[24]. Although the animal-assisted therapy needs more studies to confirm the beneficial effects on the long-term outcome in patients at high risk or in those with established cardiovascular disease, the future seems to bring the integration of animal-assisted therapy into conventional medical practice[25].

TABLE 1
FUNCTIONAL CAPACITY PARAMETERS DURING THE ERGOMETRY TEST IN PATIENTS AFTER MYOCARDIAL INFARCTION

	»Dog-walking« group (N = 29)			Control group (N = 30)		
	0 months	12 months	p	0 months	12 months	p
Maximal workload (W)	65.75±11.30	72.5±10.75	<0.05	61.75±10.5	67.6±11.6	<0.05
Maximal heart rate (%)	73.7±15.4	78.5±13.2	ns	77.5±14.3	81.3±16.5	ns
Maximal blood pressure (mmHg)	170±17.5	178±15.5	ns	175±19.5	182±20.5	ns

REFERENCES

1. TASK FORCE MEMBERS OF THE EUROPEAN SOCIETY OF CARDIOLOGY ON CARDIOVASCULAR DISEASE PREVENTION IN CLINICAL PRACTICE, Eur Journal Cardiovasc Prev Rehabil, 14 (2007) 113. — 2. ROSSETTI J, KING C, J Psychosoc Nurs Ment Health Serv, 48 (2010) 44. — 3. BRAVERMAN DL, Am J Phys Med Rehabil, 90 (2011) 599. — 4. BALEN S, VUKELIĆ-DAMIJANI N, PERŠIĆ V, RUŽIĆ A, MILETIĆ B, SAMARDŽIJA M, DOMANOVIĆ D, MIRAT J, NAKIĆ D, SOLDO I, VČEV A, Coll Antropol, 32 (2008) 285. — 5. RUŽIĆ A, PERŠIĆ V, MILETIĆ B, VČEV A, MIRAT J, SOLDO I, BATINAC T, KOVAČ T, Coll Antropol, 31 (2007), 185. — 6. WILLIS DA, Rehabil Nurs, 22 (1997) 78. — 7. GIELEN S, ERBS S, SCHULER G, HAMBRECHT R, Minerva Cardioangol, 50 (2002) 95. — 8. GIELEN S, HAMBRECHT R, Cardiol Clin, 19 (2001) 357. — 9. DIMITRIJEVIĆ I, Psychiatr Danub, 21 (2009) 236. — 10. TRIBET J, BOUCHARLAT M, MYSLINSKI M, Encephale, 34 (2008) 183. — 11. ZAKERI N, BAIN PG, J Neurol, 257 (2010) 1396. — 12. MUDZYK A, BOURQUE M, GUILBERT H, SEGUIN AD, SAVOYE MJ, Soins Gerontol, 88 (2011) 11. — 13. BOUCHARD F, LANDRY M, BELLES-ISLES M, GAGNON J, Can Oncol Nurs J, 14 (2004) 14. — 14. LOTAN M, ScientificWorldJournal, 29 (2007) 698. — 15. LARSEN BA, LINGAAS F, Tidsskr Nor Laegeforen, 117 (1997) 4375. — 16. ABATE SV, ZUCCONI M, BOXER BA, J Cardiovasc Nurs, 26 (2011) 224. — 17. ANTUNES-CORREA LM, KANAMURA BY, MELO RC, NOBRE TS, UENO LM, FRANCO FG, ROVEDA F, BRAGA AM, RONDON MU, BRUM PC, BARRETTO AC, MIDDLEKAUFF HR, NEGRAO CE, Eur J Cardiovasc Prev Rehabil, 2011 Jun 22 (Epub ahead of print). — 18. VIGORITO C, INCALZI RA, ACANFORA D, MARCHIONNI N, FATTIROLLI F, GRUPPO ITALIANO DI CARDIOLOGIA RIABILITATIVA E PREVENTIVA, Monaldi Arch Chest Dis, 60 (2003) 25. — 19. ALDCROFT SA, TAYLOR NF, BLACKSTOCK FC, O'HALLORAN PD, J Cardiopulm Rehabil Prev, 2011 Jul 4 (Epub ahead of print). — 20. MOLINO-LOVA R, PASQUINI G, VANNETTI F, PAPERINI A, FORCONI T, POLCARO P, ZIPOLI R, CECCHI F, MACCHI C, Intern Emerg Med, 2011 Jul 9 (Epub ahead of print). — 21. KARGARFARD M, ROUZBEHANI R, BASATI F, Int J Prev Med, 1 (2010) 124. — 22. MUNOZ LASA S, FERRIERO G, BRIGATTI E, VALERO R, FRANCHIGNONI F, Panminerva Med, 53 (2011) 129. — 23. CARDIAC REHABILITATION SECTION OF THE EUROPEAN ASSOCIATION OF CARDIOVASCULAR PREVENTION AND REHABILITATION, Eur J Cardiovasc Prev Rehabil, 17 (2010) 1. — 24. WENGER NK, J Am Coll Cardiol, 51 (2008) 1619. — 25. PALLEY LS, O'ROURKE PP, NIEMI SM. ILAR J, 51 (2010) 199.

A. Ružić

Clinic for Cardiovascular Diseases Treatment, Rehabilitation and Prevention, Hospital Thalassotherapia Opatija, M. Tita 188/1, 51410 Opatija, Croatia,
e-mail: alen.ruzic1@ri.t-com.hr

REDOVITO ŠETANJE S PSOM POBOLJŠAVA FIZIČKU KONDICIJU U STARIJIH BOLESNIKA KOJI SU PREBOLJELI INFARKT MIOKARDA

SAŽETAK

Pozitivno djelovanje kućnih ljubimaca na kardiovaskularno zdravlje danas su dobro poznati. Cilj ove prospektivne i kontrolirane longitudinalne studije bio je određivanje učinka svakodnevnih šetnji psom na fizičku spremnost starijih bolesnika tijekom prve godine nakon akutnog infarkta miokarda. Redovito izvođenje psa u šetnju barem 3 puta po 15 minuta dnevno tijekom12 mjeseci nakon preboljelog akutnog infarkta miokarda povezano je sa značajno većim radnim učinkom tijekom bicikl-ergometrijskog testa (72,5 ± 10,75 prema 67,6 ± 11,6 W, $p<0,05$) u intervencijskoj skupini (N=29, prosječna dob 72,5 godina) u usporebi s kontrolnom skupinom (N=30, prosječna dob 71,7 godina). Naši rezultati upućuju na mogućnost da skrb o psu kao kućnom ljubimcu može biti značajan čimbenik u održavanju kontinuirane fizičke aktivnosti kod starijih bolesnika s razvijenom kardiovaskularnom bolešću, te da može doprinijeti poboljšanju njihove fizičke sposobnosti. Potrebna su daljnja istraživanja kako bi se potvrdila ova povezanost i ispitali drugi očekivani pozitivni utjecaji posjedovanja pasa na kardiovaskularno zdravlje i ishod u bolesnika nakon preboljelog infarkta miokarda.