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Pet Ownership and Pet-Walking after Acute Myocardial Infarction: A Pet for Every Heart Attack

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Abstract

Cardiac rehabilitation after acute Myocardial Infarction (MI) decreases mortality. Pet ownership in general, dog ownership in particular, and regular dog-walking in addition correlate with improved post-MI outcomes. We propose an adjunct to conventional post-MI cardiac rehabilitation involving acquisition of a dog with a program of dog-walking. We hypothesize this will enhance the beneficial effects of cardiac rehabilitation with respect to physical and psychological outcomes.

Keywords

Cardiac rehabilitation; Pets; Acute MI; Heart attack

Introduction

In 2003 the American Heart Association Expert Panel on Population and Prevention Science published a “Guide for Improving Cardiovascular Health at the Community Level” which set 18 goals for communities to improve the cardiovascular health of their populations [1]. This paper addresses the twelfth of those goals which was to “Increase the percentage of patients suffering acute coronary syndromes (e.g., Myocardial Infarction (MI), cardiac arrhythmias) or cerebrovascular syndromes (e.g., stroke, transient ischemic attack) who receive appropriate acute interventions within the timeframe of maximal effectiveness.” In particular, acute coronary

syndromes (e.g., MI) are routinely complicated by adverse psychosocial outcomes. MI is a psychologically traumatic event, and reactions to MI have been characterized as a type of post-traumatic stress disorder [2-12]. Depression and anxiety decrease Quality of Life (QoL), are common [13-16], and are associated with mortality after MI [13,17].

Prognosis after MI is associated with many Social and Behavioral Determinants of Health (SBDH) including socioeconomic status, emotional health, social support (e.g., marriage status, participation in faith-based communities), participation in cardiac rehabilitation programs, and compliance with medications and lifestyle recommendations regarding physical activity, weight loss, and smoking [13,14,18-20]. For example, Frasure-Smith et al found that 41% of patients were depressed 7 days post-MI, and depression correlated with mortality in the first year after MI [13]. Perceived social support did not correlate with survival, but perceived social support did interact with depression to mitigate its correlation with mortality, and also correlated with decrease in depressive symptoms over the first year post-MI. A recent meta-analysis demonstrated a 31% reduction in cardiovascular death and 24 % reduction in all-cause mortality in dog owners who walked their pet compared to who individuals who did not own a dog [21].

SBDH interventions have impacted outcomes after MI in some [17-19] but not all studies [22]. American Heart Association scientific statements have suggested that more effective SBDH interventions are needed [1,23]. One example of a SBDH is pet ownership which correlates with better health and psychological status over time (compared to non-pet ownership) [24]. For example, Serpell showed that pet acquisition correlated with increased health perception compared to those who did not acquire pets [25], and pet ownership correlates with better survival after MI, even after adjustment for possible confounders [26-28]. Pet ownership seems to favorably impact depression [13,28] and cardiovascular responses to stress [29-38], mechanisms by which pet ownership may improve survival.

Beyond pet ownership or acquisition, additional benefits accrue to those who perform regular pet-walking. For example, Serpell found that the greatest health benefits among a group acquiring pets accrued to those who regularly walked their dog [25]. Dog walking correlates with increased physical activity compared to non-dog-walking pet owners [39-59], increased social interactions [60,61], and decreased cardiovascular risk factors [56,62], all of which are mechanisms by which dog walking may improve health outcomes.

According to the ARIC study of the NHLBI every 40 seconds an American has acute MI. Based on that study, annual incidence of new and recurrent AMI is 800,000 [62] Of these, about one fourth die before reaching a hospital. Of patients admitted with MI, 16% die within 30 days [6]. Depression occurs in about 40% of post-MI patients [25].

Different mechanisms have been proposed by which dog walking may be directly or indirectly linked with positive cardiovascular outcomes. Dog walking has been associated with increased level of oxytocin in the dog and the owner and reduced level of cortisol in the owner after the dog adoption [63-65]. Dog owners also have increased physical activity, positive psychological effects as a result of the companionship, improved autonomic profile, blunted stress response, and faster recovery after a stress response [49]. Dog ownership has been associated with improvement in the cardiovascular physiology, heart rate variability, lipid profile, and a decrease in systemic blood pressure [53]. Although many of these mechanisms could be the result of increased physical activity, improvement in hypertension might be the result of the direct effect of improved psychological health.

Hypothesis

We hypothesize that survivors of acute MI who do not already own dogs or cats, but who are able and willing to acquire dogs or cats after discharge, will have fewer cardiac events and better QoL compared to those able but not willing to accept dogs or cats. Further, among patients that accept dogs or cats, those who regularly walk their animal will have fewer adverse events and better QoL compared to those who do not walk their pet, or those unwilling to accept a pet.

Proposed program

Patients admitted with a principle diagnosis of acute MI should be contacted by the cardiac rehabilitation team before discharge and counseled to undergo outpatient cardiac rehabilitation. We propose that at the first outpatient cardiac rehabilitation visit, patients would be screened for participation in this program. Eligible patients would be those who (i) do not already own a dog or cat, (ii) are willing to consider acquiring a dog or cat, (iii) live in settings where animal ownership is feasible, (iv) have the physical and mental capacity to be successful pet owners, (v) have the financial resources to care for a pet, (vi) and are willing to commit to finishing the 12-week standard cardiac rehab program. Programs that wished to track outcomes and results of this project could ask their patients to complete a SF-36 QoL questionnaire initially and 1 year later, and report their experiences 1 year later. Eligible patients would be counseled about the program by cardiac rehabilitation experts at their first cardiac rehabilitation visit.

Patients willing to participate would be referred to a local participating animal shelter. Shelter personnel would provide additional information about the resources and capabilities needed for pet ownership. At the discretion of shelter personnel, patients would be allowed to select a dog or cat that has completed the shelter protocol for vaccination and animal health maintenance. Shelter personnel would assist in selecting animals whose personality and level of physical activity are appropriate for each patient's particular personality and limitations. Shelter personnel would provide counseling about animal care and treatment.

Cardiac rehabilitation staff would monitor participants and provide encouragement during the regular 12 week cardiac rehabilitation program and encourage participants to continue their dog walking on their own indefinitely.

Feasibility interviews with stakeholders

Local Animal Shelter (LAS): This proposal was discussed with the director of the Society for the Prevention of Cruelty to Animals (SPCA) animal shelter of Danville PA. She confirmed that shelter personnel match animals with each individual's needs and capabilities and showed animals on-site currently that would be good candidates. Her assessment was that the program had a good chance of successfully placing dogs with motivated owners-which of course is the SPCA's primary mission.

Cardiac Rehabilitation Programs (CRB): This proposal was discussed with the program director of cardiac rehabilitation at two community hospitals. Both agreed that the proposed program was feasible, practicable, aligned with the goals of their cardiac rehabilitation programs, and offered health benefits to participants.

Potential Scope of Program (PSP): The proposed program could be implemented by any cardiac rehabilitation program in the United States. At present about one third of the 800,000 patients with heart attacks each year are referred for cardiac rehabilitation, Thus the addition of dog-walking programs could affect at most 260,000 heart attack patients per year. While some

of these would already be dog walkers, the numbers could be expanded if more heart attack patients were referred for cardiac rehabilitation, or if the program were expanded to reach patients referred to cardiac rehabilitation after bypass surgery and coronary stenting.

Barriers and Limitations

We believe this program, if implemented, would be unique. Programs such as this have not previously been reported, so unanticipated barriers or problems may become apparent during the start-up phase. Foreseeable barriers to participation include many of the barriers to participating in conventional cardiac rehabilitation programs including physical limitations to exercise, lack of motivation, and lack of financial resources. Some patients live in neighborhoods where dog-walking would be impractical or even dangerous. Among patients who wished to participate, not all would leave the shelter with an animal due either to shortage of animals suitable for adoption (since many animals are too large, too wild, too active, or too loud) or a failure to find an animal that has the characteristics they require in an adopted pet (i.e., to which they can bond).

Conclusion

Pet ownership and dog walking in particular offer health benefits to the general public, which might be magnified when offered to the vulnerable population of post-MI patients undergoing cardiac rehabilitation. We propose a program of pet acquisition and regular pet-walking that would be easily implemented, inexpensive, and complementary to conventional cardiac rehabilitation programs.

Disclosure

The authors have no relationships with industry and no potential conflicts of interest.

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