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Clinical Research

The First Dedicated Cardiac Rehabilitation Program for Patients With Spontaneous Coronary Artery Dissection: Description and Initial Results

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ABSTRACT

Background: Spontaneous coronary artery dissection (SCAD) is an important cause of myocardial infarction in women, but the role of rehabilitation after SCAD is unclear.

Methods: We designed a dedicated SCAD cardiac rehabilitation (SCAD-CR) program for our SCAD survivors at Vancouver General Hospital. This program encompasses a multidisciplinary approach including exercise rehabilitation, psychosocial counselling, dietary and cardiovascular disease education, and peer group support. Exercise and educational classes were scheduled weekly with a targeted participation of 6 months. Psychosocial counselling, mindful living sessions, social worker and psychiatry evaluations, and peer-group support were offered.

Results: We report our first consecutive cohort of 70 SCAD women who joined SCAD-CR from November 2011 to April 2015. The average age was 52.3 ± 8.4 years. Mean participation duration was 12.4 ± 10.5 weeks; 28 completed 6 months, 48 completed ≥ 1 month. At entry, 44 (62.9%) had recurrent chest pains and average metabolic

RÉSUMÉ

Introduction : La dissection spontanée de l'artère coronaire (DSAC) est une cause importante de l'infarctus du myocarde chez les femmes, mais on en connaît peu sur le rôle de la réadaptation après la DSAC.

Méthodes : Nous avons élaboré un programme de réadaptation cardiaque après la DSAC (RC-DSAC) destiné à nos survivants de la DSAC au Vancouver General Hospital. Ce programme comprend une approche multidisciplinaire dont la réadaptation par l'exercice, le counseling psychosocial, l'enseignement des maladies cardiovasculaires et de l'alimentation, et les groupes de soutien par les pairs. Les séances d'exercices et d'enseignement étaient offertes chaque semaine et visaient une participation de 6 mois. Le counseling psychosocial, les séances sur la vie en pleine conscience, les évaluations au service social et en psychiatrie, et les groupes de soutien par les pairs étaient offerts.

Résultats : Nous présentons notre première cohorte consécutive de 70 femmes ayant une DSAC qui se sont jointes à la RC-DSAC de novembre 2011 à avril 2015. L'âge moyen était de 52,3 ± 8,4 ans. La

Spontaneous coronary artery dissection (SCAD) is increasingly recognized as an important cause of troponin-positive acute coronary syndrome (ACS) in women.[1,2] Nearly a quarter of myocardial infarction (MI) in women younger than 50 years of age is attributed to SCAD.[3] Although SCAD was previously thought to be mostly idiopathic, we now understand that it is frequently related to predisposing arteriopathies (eg, fibromuscular dysplasia [FMD]) and precipitating stressors (eg, intense emotional or physical stressors) from contemporary case series.[4,5]

SCAD can be associated with an in-hospital mortality rate as high as 5% and 1-year mortality between 1% and 4%.[1,6,7] Alarmingly, it was recognized that SCAD patients have high subsequent major adverse cardiac event (MACE) rates, especially for recurrent MI and SCAD (15%-20% and 13%-18%, respectively).[5,8] There is no definitive evidence on the optimal management of SCAD, but the general approach is conservative.[5,8,9] Revascularization with percutaneous coronary intervention (PCI) or coronary artery bypass graft surgery is typically reserved for unstable patients or those with refractory myocardial ischemia.[5,10]

Unlike established evidence-based rehabilitation programs for ACS and heart failure,[11] no cardiac rehabilitation protocol exists for SCAD. SCAD patients remain at high risk for

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equivalents on exercise treadmill test was 10.1 ± 3.3. At program exit, the proportion with recurrent chest pains was lower (37.1%) and average metabolic equivalents was higher 11.5 ± 3.5 (both $P < 0.001$). There was a significant improvement in the STOP-D depression questionnaire, with mean scores of 13.0 ± 1.4 before and 8.0 ± 1.7 after the SCAD-CR ($P = 0.046$). Twenty (28.6%) social worker referrals and 19 (27.1%) psychiatry referrals were made. Mean follow-up was 3.8 ± 2.9 years from the presenting SCAD event, and the major cardiac adverse event rate was 4.3%, lower than our non-SCAD-CR cohort (n = 145; 26.2%; $P < 0.001$).

Conclusions: This is the first dedicated SCAD-CR program to address the unique exercise and psychosocial needs of SCAD survivors. Our program appears safe and beneficial in improving chest pain, exercise capacity, psychosocial well-being and cardiovascular events.

durée moyenne de participation était de 12,4 ± 10,5 semaines; 28 femmes y ont participé 6 mois, 48 y ont participé ≥ 1 mois. À l'inscription, 44 femmes (62,9 %) avaient des douleurs thoraciques récurrentes. Les valeurs moyennes de l'équivalent métabolique à l'épreuve de marche sur tapis roulant étaient de 10,1 ± 3,3. À la sortie du programme, la proportion de femmes qui avaient des douleurs thoraciques récurrentes était plus faible (37,1 %). Les valeurs moyennes de l'équivalent métabolique étaient supérieures à 11,5 ± 3,5 ($P < 0,001$ pour les deux). Les scores moyens au questionnaire sur la dépression STOP-D montraient une amélioration significative, soit de 13,0 ± 1,4 avant la RC-DSAC et de 8,0 ± 1,7 après ($P = 0,046$). Vingt (28,6 %) orientations au service social et 19 (27,1 %) orientations en psychiatrie étaient faites. Le suivi moyen était de 3,8 ± 2,9 ans à partir de la DSAC, et le taux d'événement indésirable majeur était de 4,3 %, soit plus faible que notre cohorte qui n'avait pas participé à la RC-DSAC (n = 145; 26,2 %; $P < 0,001$).

Conclusions : Il s'agit du premier programme de RC-DSAC destiné à répondre aux besoins particuliers en matière d'exercice et de counseling psychosocial des survivants de la DSAC. Notre programme semble sûr et bénéfique pour réduire les douleurs thoraciques et les événements cardiovasculaires, et améliorer la capacité à l'effort et le bien-être psychosocial.

recurrent events and associated psychosocial consequences. The application of a formalized, structured SCAD-specific rehabilitation program might mitigate these negative outcomes. Such a dedicated program might also provide educational, physical, and psychosocial support.

Recognizing a correlation between intense physical activity and SCAD, standard cardiac rehabilitation programs with an intense exercise component might not be appropriate for SCAD patients. Moreover, an emphasis on psychosocial rehabilitation helps to address the unique emotional precipitants for SCAD. Therefore, we designed a SCAD-specific multidisciplinary cardiac rehabilitation program (SCAD-CR) at our institution, a quaternary referral centre for SCAD in British Columbia. We sought to assess whether a dedicated SCAD-CR program is feasible, safe, and efficacious in improving the physical and psychosocial state, preventing chest pain recurrence, and improving exercise tolerance.

Methods

We designed a cardiac rehabilitation program in 2011 specifically for women after a SCAD event at Vancouver General Hospital (VGH), for patients who live in Vancouver and the surrounding suburbs in British Columbia. This SCAD-CR program (Table 1) was modified from a standard cardiac rehabilitation program after atherosclerotic MI. A dedicated weekly rehabilitation session was scheduled every Friday, and patients were highly encouraged to attend to benefit from peer-group support. When patients could not attend the Friday session, other rehabilitation appointments were scheduled, and the same SCAD-CR protocol was used. The program was designed with targeted participation of 6 months; however, adherence to a full 6-month program can be challenging, and patients were strongly encouraged to attend a minimum of 1 month.

An entrance exercise treadmill test (ETT) was performed for all participants. A routine preprogram interview, consultation, and physical examination were performed by a case manager and a cardiac rehabilitation cardiologist. Baseline psychosocial questionnaires, Supervision Tool for Outcomes and Process in Depression (STOP-D), Patient Health Questionnaire-9, Social Isolation, and Worry, Anxiety, Tension, to assess depression, anxiety, and stress were administered. STOP-D is a 5-item outpatient screening questionnaire for each common psychosocial problem (depression, anxiety, stress, anger, and low social support).[12] The Patient Health Questionnaire-9 is a brief self-reporting tool for screening, diagnosing, monitoring, and measuring the severity of depression.[13] Baseline demographic

Table 1. Description of the VGH SCAD-CR protocol

VGH SCAD-CR protocol
1. Weekly classes of SCAD survivors with targeted participation of 6 months
2. One-hour weekly exercise class consisting of 15-minute warm-up, 30-minute cardiovascular exercise on aerobic machines, and 15-minute cool-down
3. To reduce arterial shear stress, target exercise heart rate is 50%-70% of heart rate reserve on the basis of the entrance exercise treadmill test, and systolic blood pressure during exercise is limited to < 130 mm Hg
4. Exercise is adjusted to upper heart rate target to achieve rating of perceived exertion of "moderate" to "somewhat difficult"
5. Resistance training with 2- to 12-pound free weights to increase muscle strength, starting with lighter weights and progressing with strength gain
6. Patients are advised to avoid lifting weights > 20 pounds
7. A 20-minute educational session per week on heart-healthy nutrition, risk factors, and treatment of heart disease, and stress management, emphasizing women's heart disease
8. Counselling, mindful living sessions, and peer-support from other SCAD survivors
9. Outside of formal sessions, participants can exercise in the supervised open gymnasium
10. Regular review of cardiac medications (eg, aspirin, β-blocker, angiotensin-converting enzyme inhibitor, statin) and coordination with the VGH SCAD clinic

CR, cardiac rehabilitation; SCAD, spontaneous coronary artery dissection; VGH, Vancouver General Hospital.