



Promotion of Pre- and Post-Transplant Physical Exercise in the Emilia-Romagna Region: The Network of the Program “Transplantation, Physical Activity, and Sport”

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ABSTRACT

Background. Following the positive experience of the national project “A transplant...and now it’s time for sport,” the Transplant Reference Center of the Emilia-Romagna Region has pursued the promotion of pre- and post-transplant physical exercise by developing a network.

Methods. The path involved the transplant centers and operative units (UU.OO) who wanted to target transplant and waiting list patients, who are clinically stable, to perform personalized exercise through a program (supervised or not) prescribed by a specialist in sports medicine. With the collaboration of the Collective Prevention and Public Health Service, the network was established, consisting of the sports medicine centers and the gyms that promote health for adapted physical activity (PS-AMA). To implement the network, training courses for all the professionals involved (doctors, nurses, exercise specialists) and operational meetings in the transplant centers-nephrology units with patients’ associations have been organized.

Results. To date, there are 14 transplant centers and UU.OO, 9 sports medicine centers, and 45 PS-AMA involved in this network. Seven training courses were organized with the participation of 193 health professionals. Since January 2016, there have been 65 transplanted patients and 5 patients on the waiting list who practice the prescribed exercise. Of these, 45 carry out supervised exercise in PS-AMA; 25 perform autonomous exercise. Each patient is monitored every 6 months. No problems related to the exercise performance were recorded.

Conclusions. The development of a network of professionals and associations is the key element to raise awareness of physical activity among transplanted and waiting-for-transplant patients, reducing the pathologies associated with a sedentary lifestyle.

THE World Health Organization identified physical inactivity as the fourth leading risk factor for global mortality. Physical inactivity levels are increasing in many countries with major implications for the prevalence of noncommunicable diseases (NCDs) and the general health of the population worldwide.

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0041-1345/19
<https://doi.org/10.1016/j.transproceed.2019.02.074>

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The Global Recommendations on Physical Activity for Health (at least 150 minutes of moderate-intensity aerobic physical activity throughout the week) are primary prevention of NCDs [1].

Transplant recipients are at higher risk of developing metabolic complications, bone loss, and sarcopenia, which are associated with cardiovascular diseases [2,3]. Long-term immunosuppression and a sedentary lifestyle are often associated with a gradual weight gain, weakness, and fatigue, which represent modifiable risk factors [4–6]. Even if exercise capacity and muscle strength improve after transplant, they remain significantly lower than those in age- and sex-matched people without solid organ transplant [7,8].

Physical exercise in the pretransplant period is correlated to better physical function and improved outcomes, including both reduced all-cause and cardiovascular mortality risk and graft survival in transplant recipients [9–11].

The beneficial role of physical activity has been demonstrated also on the health-related quality of life (HRQoL) in transplant patients [12].

In the transplant world, both in the pre- and post-transplant, there are also psychological and logistic barriers that limit access to physical activity programs [13–15].

In addition, the limited existence of guidelines on physical activity for pre- and post-transplant patients highlight the need for the development of a regional network that encourages the transplanted population and waiting-list patients to an active lifestyle for the prevention of NCDs [1].

Thanks to the positive results of the national study protocol “A transplant...and now it’s time for sport” that demonstrated the beneficial effects of prescribed and supervised physical exercise in transplant recipients by creating a collaborative network between transplant centers, sports medicine centers and gyms [12,16,17]; the Transplants Reference Center of the Emilia-Romagna Region has implemented the local network, creating an ad hoc program to promote the exercise both pre- and post-transplant called “Transplantation, Physical Activity, and Sport.”

METHODS

The local network is based on a model of cooperation between regional transplant centers-operative units, sport medicine centers, and accredited gyms that promote health for adapted physical activity (PS-AMA), together with patients’ associations that promote the regional program.

Transplant physicians select clinically stable transplanted and waiting-list patients. Sport physicians perform functional tests (aerobic capacity and muscle strength) and prescribe a personalized exercise program. HRQoL is also recorded. Each patient can decide to do the exercise program indoors (in PS-AMA with supervision) or outdoors (with app support, without supervision). Exercise specialists working in the PS-AMA (graduates and post-graduates in physical education) support the prescribed exercise by supervising the activity. All patients are monitored every 6 months at sports medicine centers. Regular clinical follow-up continues at the transplant centers-operative units (UU.OO) as routine (Fig 1).

This network aims to check the patients from the clinical (transplant center) and functional (sports medicine units) point of

view but also to identify facilities in their home districts where patients can easily perform their training programs.

The collaboration with the Public Prevention and Collective Health Service of the Emilia-Romagna Region was of pivotal importance. Through the Resolution of the Regional Council of 2127 of December 5, 2016, it has promoted the development of exercise programs for transplant and waiting-list patients; has accredited PS-AMA throughout the regional territory; has established that the exercise is made on prescription (thus enabling patients in the pre- and post-transplant to be exempt from paying a ticket for specialist visits at sports medicine centers). To implement the network and the accession of all the personnel involved in this network (doctors, nurses, exercise specialists), a number of training courses and direct meeting with the transplant centers-UU.OO and patients’ associations have been organized in all the provinces of the region.

In addition, a devoted information campaign was organized in collaboration with the Emilia-Romagna Region through the distribution of leaflets describing the program, including the program in the Transplants Reference Center of the Emilia-Romagna Region service card, and presenting it at national and international conferences.

RESULTS

To date, there are 11 transplant centers-UU.OO, 9 sports medicine centers, and 45 PS-AMA involved in this network. Seven training courses were organized with the participation of 193 health professionals (24 nephrologists, 9 hepatologists, 30 sports physicians, 45 nurses, 85 exercise specialists). At least 3 health operators for each transplant center-UU.OO were involved. In particular, to motivate patients and increase adherence in the program, nursing staff have been involved in collaboration with the medical team in monitoring the transplant and waiting-list patients. From January 2016 to December 2018, there were 65 transplanted patients (46 renal, 14 liver, and 5 lung transplantations) and 5 patients on the waiting list (for renal transplantation) who do prescribed physical activity (Table 1). Of these, 45 carried out supervised physical exercise in accredited PS-AMA; 25 performed autonomous exercise. Each patient was monitored every 6 months. The number of patients included in the path is increasing. At this moment, 33 and 10 patients have reached 6 and 12 months of observation, respectively. Preliminary data showed a satisfying adherence to prescribed exercises and improved perceived HRQoL. No particular problems related to physical activity have been recorded.

CONCLUSION

The development of a network of professionals (physicians, nurses, exercise specialists) together with patients’ associations has been the key element for motivating transplant and waiting-list patients to be physically active by encouraging them to an active life and reducing the risk of developing pathologies associated with a sedentary lifestyle.

The creation of a multiprofessional network promotes cultural growth related to the importance of physical

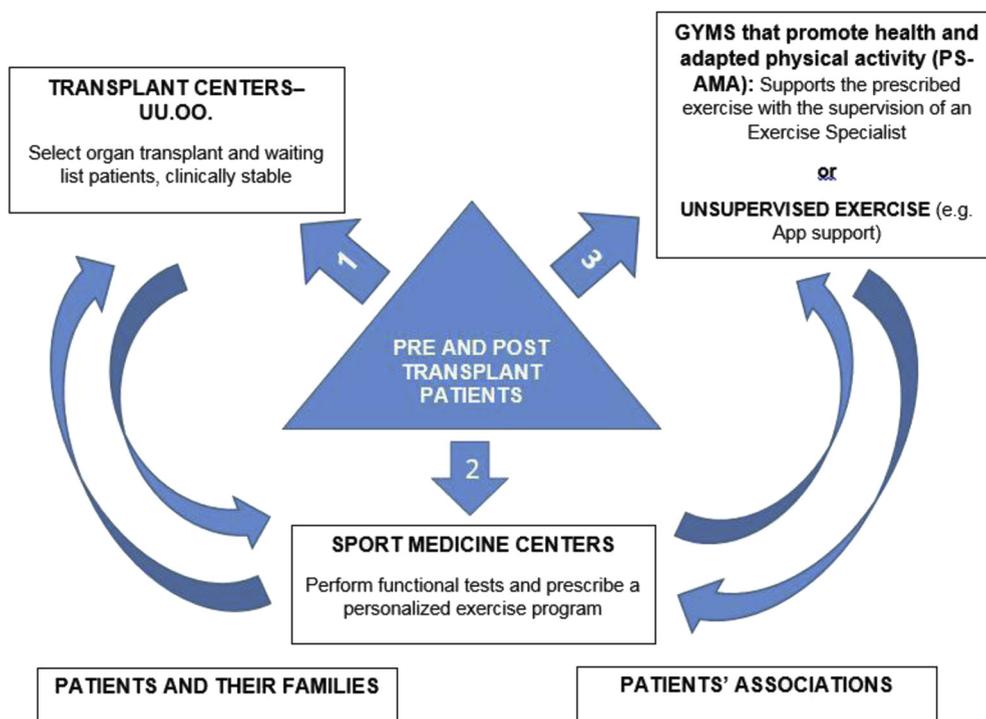


Fig 1. The network of the program “Transplantation, Physical Activity, and Sport” for the promotion of pre- and post-transplantation exercise in Emilia-Romagna Region.

exercise in populations with chronic diseases and increased risk of cardiovascular disease. The identification of paths and places where physical exercise can be practiced helps overcome both the psychological and logistic barriers faced by the patients and their families.

The possibility to access an unsupervised exercise programs also enlarges the potential number of participants and allows the resolution of the problems of economic sustainability related to the practice of exercise programs in the gyms. Furthermore, overweight or dysmetabolic organ donor candidates could be included in physical activity programs as a therapeutic tool.

The Italian National Transplant Center aims to extend this network to all Italian regions. The regional and national

prevention plans will be able to support the implementation of the physical activity prescription programs for patients with chronic conditions in which pre- and post-transplant patients are included.

The promotion of pre- and post-transplant physical exercise, in order to be effective, should be encouraged by physicians and nurses from the transplant centers-UU.OO who routinely see the patients during follow-ups and who have a great influence on their decisions in terms of changes of lifestyle, exercising, and following a healthy diet.

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Table 1. Patient Enrollment on the Regional Program from January 2016 to December 2018

Transplant Centers-UU.OO	On Waiting List	Renal Transplantation	Liver Transplantation	Lung Transplantation
	for Renal Transplantation			
Bologna	0	5	13	1
Ferrara	0	8	0	0
Modena	2	2	0	0
Forlì-Cesena	3	31	1	4
Total	5	46	14	5

Thirty-three and 10 patients have reached 6 and 12 months of observation, respectively.

UU.OO, operative units.

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