

INFLUENCE OF PHYSICAL ACTIVITY ON THE HEALTH CONDITION OF PEOPLE AFTER ORGAN TRANSPLANTATION

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Abstract

Introduction: Transplantation has become a very important part of the treatment of organ failure in the last decades. Patients after transplantation can lead an almost normal life and they do not have to give up physical activity. The article presents the results of a questionnaire, which was carried out among 63 kidney and 2 liver transplant patients.

Aim: Our aim was to study the effects of physical activity after transplantation and specifically to evaluate whether such treatment might cause deterioration in health.

Results: Our results indicate that physically to receipt did not cause any deterioration in general will and general health physical efficiency the bar treat tests. Psychological well-being was not evaluated. Data from international medical publications concerning professional sportsmen who had undergone organ transplantation (heart, lung, kidney and liver recipients) have also been evaluated the evidence from this survey and that of the courses confirms that physically committee should be recommended to transplant recipients.

Conclusions: It is an important part of the antiatherogenic and antiosteoporotic prophylaxis, especially for people after kidney transplantation. Indeed, participation in sports should be advised for all organ recipients whose general health gives no cause for concern.

Key words: *sport, transplantation, physical activity*

Introduction

Transplantation has become a very important part of the treatment of organ failure in the last decades. Patients after transplantation can lead an almost normal life. They do not have to give up physical activity. Moreover, sport can contribute to the improvement of the quality of their life (1). An outstanding example is Chris Klug, a professional snowboarder, underwent liver transplantation due to primary sclerosing cholangitis. Two years after the operation, in 2002, he was awarded a bronze medal at the Winter Olympics in Salt Lake City (2). Another instance is Jonah Tali Lomu, a New Zealand rugby star, made his debut on the national team when he was nineteen (the youngest rugby national team player in history). In 1996, he was diagnosed with the nephrotic syndrome. In May 2003, he started dialysis, and in June 2004, he underwent kidney transplantation. Soon, he returned to play as a professional rugby player and achieved many sport successes (3).

A further account (4) describes a case of a 45-year old sportsman with dilated cardiomyopathy who underwent a successful heart transplant. A few months after the operation, he participated in a 10 km run. Yet another example(5), is that of a 26-year old man in the terminal stadium of heart failure, also caused by dilated cardiomyopathy. After the transplantation,

he started a rehabilitation program consisting mainly of physical activity. After 22 months, his effort tolerance was comparable with that of a healthy person confirmation is also available in a number of other publications (1,6). Kirchner et al found that in a long-term study on 36 patients 91% of his patients felt better than before the transplantation. 52% of patients regular participation participated in sports was found in 52% of all patients.

However they do not appear to be published studies establishing a defined link between physical well-being and sporting a given case. Nor, on the contrary, are there any specific evaluations in the literature of negative effects on the physical health of transplant recipients as a result of sporting activity.

The World Transplant Games Federation (WTGF) is a world-wide organization for people who practice sport after transplantation. Its activities contributed to the global increase of the number of organ donors (7). WTGF has branches in many countries, including Poland (information about the Polish department can be found at www.sportpotransplantacji.org.pl). Ernesto Antonio, one of the members of this federation, is an Irish runner who regularly takes part in marathons, in spite of being a heart graft recipient. Tuija Helander, another WTGF member, underwent lung transplantation. This did not prevent him from

winning medals in various athletic disciplines during competitions organized by WTGF.

Wray et al proved that participation in World Transplant Games had a positive influence on psychological well-being of children (8).

Having established the necessary database from Polish members of the WTGF, a questionnaire was devised to check the quality of life and thus enable us to assess whether physical activity had affected their health.

Materials and methods

We carried out a telephone survey or sent the questionnaires via email to people who were practicing various sport disciplines after kidney and liver transplantation. We also used the results of a survey carried out by Tomasz Potopa of 41 recipients of whom 33 were physically active after kidney transplantations (www.niesmiertelni.pl). Our questionnaire use the same questions.

47 the questionnaires were sent to active sports men and women who were members of the Polish

department of the Polish department of the WTGF of whom 21 replied. Phone surveys on the 26 remaining patients were carried out.

There was 73 responses in or available for analysis. Of these 65 patients enjoyed regular physical exercise. The 65 patients formed the basis of our analysis.

We asked our respondents to define their health condition and physical ability before and after the transplantation as well as other factors enumerated in table 1 (using a range from 1 to 10).

Results

The average age of the 65 recipients aged 14 and 62 years was 38.

63 of the patients had undergone kidney transplantation and 2 were liver transplant recipients. 62 of the recipients were male. The average period of time after transplantation this cohort was 5 years and 4 months the range being 4 months to 14 years. The mean time of waiting for the transplantation in the examined group was 19 months (median: 13 months,

Table 1. *Questionnaire*

Questionnaire
1. Age:
2. Gender:
3. Transplanted organ:
4. The disease which led to the transplantation:
5. How long had you been waiting for the transplantation?
6. When did the transplantation take place?
7. What drugs did you use after transplantation?
8. What drugs do you currently use?
9. What was the duration between the transplantation and starting physical activity?
10. What sport disciplines do you practice?
11. Do you have any of the symptoms listed below during or after training?
• heart problems (pain in the chest numbness of the left hand)
• pain in muscles
• pain in joints
• abdominal pain
• headache
• problems with vision
• vomiting
• diarrhoea
• problems with passing water
• pain in the operated area
• are you short of breath
• other complaints...
12. Define your health condition before the transplantation (using a range from 1 to 10).
13. Define your current health condition (using a range from 1 to 10)
14. Define your physical ability before the transplantation (using a range from 1 to 10)
15. Define your current physical ability (using a range from 1 to 10)
16. Are there any differences between lab test results obtained before and after starting the physical activity?

range: 1-48 months). Physical activity was normally commenced 9 months after the operation (median: 7 months, range: 1 month- 6 years). The most popular sports were: running, skiing, bike riding and tennis. Shot-put, body-building were also practiced by some patients.

All of the patients received immunosuppressive drugs and some were also receiving antihypertensive drugs, magnesium, potassium and calcium.

The main reason for the kidney transplantations was glomerulonephritis. The other causes were: polycystic kidney disease, systemic lupus erythematosus, hemolytic-uremic syndrome, Goodpateur's syndrome and Wegener's granulomatosis. Toxic (alcoholic) cirrhosis and cirrhosis due to hepatitis B virus infection led to the liver transplants (Table 2).

Table 2. Reasons for the transplantation in the examined group (n=65)

Reasons for the transplantation	Number of patients
glomerulonephritis	34
systemic lupus erythematosus	13
polycystic kidney disease	8
hemolytic-uremic syndrome	4
Goodpateur's syndrome	2
Wegener's granulomatosis	1
Toxic (alcoholic) liver cirrhosis	1
Liver cirrhosis due to hepatitis B virus infection	1

Results

16% (n=65) of the studied group observed improvement in their physical and health condition after the transplantation, 22% noticed deterioration in their health and 62% did not notice changes (Fig.1). 17 patients (26% of the respondents) felt distress during and shortly after exercise. 8 respondents (12%) felt pain in muscles and joints, and 3 individuals (4.5%) complained of pain in the operated area. All the above patients began physical activity in less than 3 months after the transplantation. Early onset of fatigue was the problem of 6 patients (9%). One person complained of symptoms associated with hypertension, whilst one complained of palpitation of the heart. One of the respondents had a relapse of pancreatitis (Fig.2).

Out of the 65 patients, no one noted the deterioration of lab tests after starting the physical activity, while 4 respondents noticed improvement (6%).

Discussion

Our results show that physical activity does not cause deterioration in health condition of people after transplantation. 26% of the respondents complained of pain during exercise. This was, however, mostly musculoskeletal pain, and thus could not be definitely associated either with the person's physical condition after transplantation, or with the immunosuppressive treatment. Early onset of fatigue is a subjective symptom and was felt mainly by older patients. Three respondents, who started training in the first period after surgical intervention, felt pain in the operated area but only for a few months. Other patients, who began their training

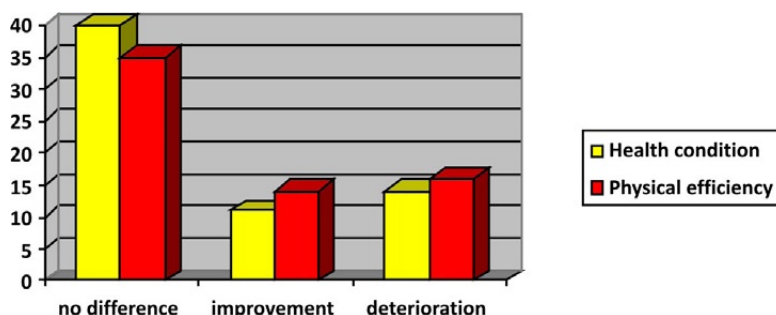


Fig. 1. Health condition and physical ability before and after the transplantation

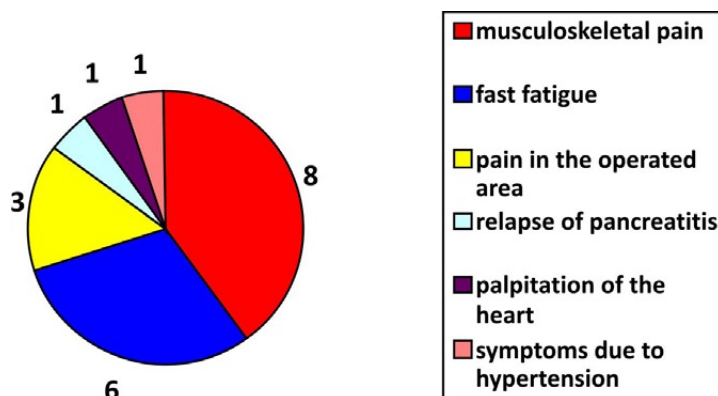


Fig. 2. Occurrence of the symptoms in surveyed patients (n=65)

three months or more after the operation, did not suffer from focal pain located around the surgical wound.

One of the patients had a relapse of pancreatitis. He denied practicing endurance sports or any traumatic incident associated with sport. In view all of the absence all of scientific correlation between normal physical activity and pancreatitis it was felt that the onset of pancreatitis could not be correlated with his physical activity.

Heart palpitation, suffered by a 52-year old man, was the only disturbing symptom. Having undergone kidney transplantation, this patient had problems with the water-mineral balance, probably caused by the intake of diuretics. Low potassium levels could have contributed to cardiac arrhythmias felt by the patient as heart palpitation. Increased exercise and further electrolyte loss could have aggravated the symptom. The patient had to supplement magnesium and potassium pharmacologically.

People who train after transplantation are examined before every major competition. Thus, doctors are able to diagnose many illnesses at the initial stadium. Sport gives people a chance to care about their health actively. Initial pain in the operated area can influence the choice of whether to commence physical activity or not.

Certainly some organ recipients have a natural fear that Patients that exercise will result in pain or damage the newly transplanted organ.

Though severe trauma can certainly result in organ injury, running, cycling or tennis carry a minimal risk of serious injury. Patients should, therefore, be encouraged to start with light training, for example long walks or climbing up stairs. They can then move on to other forms of physical activity, i.e. swimming, jogging. We recommend that this should take place no earlier than 3 months after the operation in order to allow proper postoperative wound healing and graft stabilization. Our belief is that sports as martial arts, bungee jumping or horse riding should not be practiced by post-transplant patients, since they carry a significantly high risk of severe trauma.

Conclusion

Sport is undoubtedly a very important element in the process of rehabilitation after transplantation. Medical publications, as well as examples of post-transplant world-class sportsmen, prove that transplantation does not result in a decrease in physical

performance. There are numerous reports of outstanding sport achievements of recipients of kidney or liver transplantation (2-5). These people often participate in competitions alongside healthy sportsmen. The results of our survey show that physical activity does not have an unfavorable influence on the health condition of post-transplant patients. Exercise can decrease the risk of the development of atherosclerosis, non-insulin dependent diabetes mellitus and osteoporosis. It also improves the patient's quality of life (8,9).

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