

BALANCE

Promoting energy balance related behavior after liver transplantation

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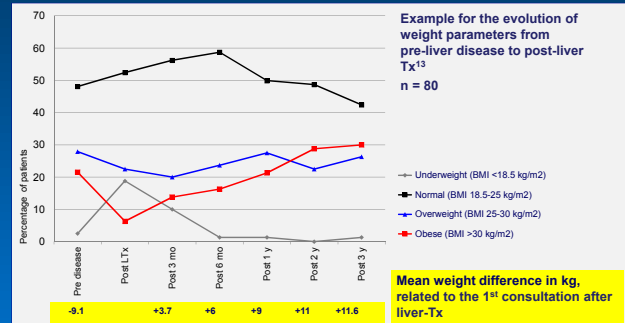
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Background

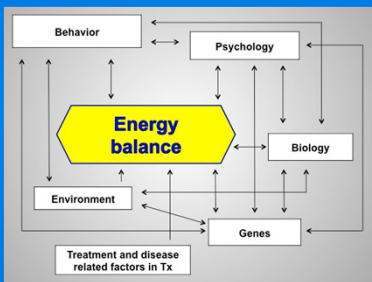
- Overweight and obesity have become a global public health issue over the last decades¹. High prevalence rates of overweight and obesity are also mirrored in the transplant (Tx) population:

	Overweight BMI 25-29.9 kg/m ²		Obesity BMI ≥ 30 kg/m ²		Data from
	At transplant	1y post-transplant	At transplant	1y post-transplant	
Liver	33 %	34 %	13 %	24 %	U.K. 2005 ¹
	29 %	34 %	15 %	24 %	U.S. 1998 ²
Kidney	31 %	41 %	9 %	18 %	Spain 2010 ³
	35 %	30 %	34 %	49 %	U.S. 2007 ⁴
Lung	14 %	25 %	4 %	7 %	Canada 2003 ⁵
Heart	37 %	41 %	17 %	33 %	U.S. 2005 ⁶
	32 %	38 %	3 %	15 %	Brazil 2008 ⁷

- Pre-Tx overweight and obesity** have been associated with decreased short- and long-term survival in lung-Tx², higher risk of delayed graft function in kidney-Tx³, and new-onset diabetes mellitus in kidney-Tx⁴ and heart-Tx⁵.
- Post-Tx weight gain** (mean 5-15 kg) has been described particularly in the first year after Tx. Weight gain and obesity at 1 year after Tx have been associated with increased risk of mortality and graft loss and a higher incidence of hypertension, diabetes mellitus, hyperlipidemia, low high-density lipoprotein and ischemic heart disease in kidney-Tx^{6,7}.



- The impact of weight gain, overweight and obesity on health needs to be taken seriously in the chronically ill Tx population. While graft survival in the first year after Tx increased impressively over the last 20 years, long-term survival has not improved likewise⁸. This might be due to factors related to patient's life style as well as the effects of long-term immunosuppressive medication, associated with the emergence of new co-morbidities such as hypertension, dyslipidemia and diabetes mellitus⁹, contributing to the increased risk for metabolic syndrome and cardiovascular disease after Tx¹⁰.



Energy balance framework

- Weight gain is the result of an energy imbalance, due to increased energy intake and/or decreased energy expenditure over a longer period of time.
- Sedentary lifestyle and a high-caloric diet seem to be the most obvious causes for weight gain. However, underlying mechanisms are much more complex and energy balance is influenced by various interrelated factors, as shown in the framework.
- Preventive interventions are recommended to tackle the issue of weight gain, overweight and obesity^{11,12}.

Rationale

A broad understanding of weight gain, overweight and obesity within and across the solid organ Tx population is hindered, as ... no study explored this issue in all four organ groups concomitantly, using the same methodological approach. ... findings regarding outcomes remain conflicting and incomplete, as not all outcomes have been examined in every organ group. ... previous research about risk factors remains inconclusive due to methodological shortcomings and a lack of theoretical frameworks. ... no study examined energy balance related behavior, its explaining factors and effective weight management interventions in liver-Tx.

Aims

Overall Aim: Development of a behavioral intervention based on diet and physical activity to support effective weight management and a healthy lifestyle after liver-Tx.

- In the liver-, kidney-, heart- and lung-Tx population:
 - to describe the prevalence and examine the evolution of body weight parameters from pre-Tx to 4-years post-Tx;
 - to determine the impact of pre-Tx overweight and obesity, and post-Tx weight gain, overweight and obesity on selected post-Tx patient outcomes;
 - to determine risk factors for post-Tx weight gain, overweight and obesity in the first 4 years post-Tx;
 - to identify genotypes associated with body weight parameters during 4-years post-Tx.
- To explore energy balance related behavior and its correlates in the 1st year after liver-Tx.
- To develop and test the feasibility and efficacy of a behavioral intervention to achieve and maintain energy balance for weight management within the 1st year after liver-Tx.

Methods

This PhD project covers a multiphase mixed method research program, where several studies are conducted to reach the overall aim. The phases are linked together so that one phase can inform another

- Aim 1:** A secondary data analysis using data from the nation wide prospective Swiss Transplant Cohort Study will be used to provide essential evidence.
- Aim 2:** A qualitative study will explore energy balance related behavior regarding weight management after liver-Tx.
- Aim 3:** The first 4 steps of the intervention mapping protocol will be used to systematically develop the behavioral intervention. A mixed method study with an explanatory sequential design (pilot-RCT and in-depth interviews) will be used to test the efficacy, feasibility and acceptance of the intervention.

References:

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 (*) Reference available upon request from Sonja Beckmann

