The effect of lifestyle (exercise or diet) on liver fat in overweight and obese adults with non-alcoholic fatty liver disease
A systematic review

Vissers, Dirk¹,²,³, Valentina Steiner¹, Linard Baier¹, Sarah Gschwend¹, Manuela Lendi¹, Nicole Schuler¹, Joel Penz¹, Corina Peng¹, Clijsen, Ron¹,³,⁴, Baeyens, Jean-Pierre¹,²,³

1 University College Physiotherapy, Thim van der Laan, Landquart, Switzerland
2 University of Antwerp, Physiotherapy and Health Sciences, Antwerp, Belgium
3 Vrije Universiteit Brussel, Faculty of Physical Education and Physiotherapy, Brussels, Belgium
4 University of Applied Sciences and Arts of Southern Switzerland, Department of Health Sciences, Landquart, Switzerland

INTRODUCTION
The prevalence of the risk factors of non-alcoholic fatty liver disease (NAFLD) such as insulin resistance and obesity have increased worldwide. In western countries there is a prevalence of NAFLD of 25-30%.

OBJECTIVE
The aim of this study was to assess the effect of diet and/or exercise on liver fat in overweight and obese adults with non-alcoholic fatty liver disease.

METHODS
• The databases Pubmed, PEDro and the Cochrane Library have been searched for publications using the key words: diet, exercise, overweight, obesity, adults, liver, waist/hip ratio, weight loss and hepatic lipids. All keywords used in Pubmed were controlled by MeSH.
  • Inclusion criteria: overweight/obese subjects (BMI > 25kg/m²) hip waist ratio of > 0.8 for women and > 0.9 for men, adults aged > 19 years.
  • Exclusion criteria: publication date earlier than 10 years, alcoholic fatty liver disease, medication influenced diet.

RESULTS
• The initial search resulted in 46 articles after removing duplicates. After screening on title, abstract and full-text 9 CT's and RCT's fulfilled our planned criteria for inclusion.

Diet / weight loss
• a very low carbohydrate diet as well as a isocaloric diet rich in vegetables and low in polysaturated free fatty acids (PUFA) reduces liver fat content (p = 0.06) and liver size (p = 0.01) (Benjaminov et al., 2007)

Exercise
• six weeks at 60-85% of the maximal aerobic capacity (VO₂max) for at least 20 minutes for a minimum of three times per week can decrease liver fat (p < 0.05) (Shojaee-Moradie et al., 2007).
  • aerobic exercise is effective on a treadmill, cycle ergometer, elliptical trainer or any combination of these calorically equivalent to 19.2 km/week (~ 12 miles/wk) at 75% O₂ uptake (VO₂) (p < 0.05) (Slentz et al., 2011).

Exercise and diet / weight loss
• a minor loss of body weight (-3%) was accompanied by a LF content (-33%) (Thamer et al., 2007).

CONCLUSION
This systematic review shows a positive effect of weight loss by diet or aerobic training on liver fat. Even only four weeks of hypocaloric diet or six weeks aerobic exercise can reduce liver fat content and liver size.

Contact: ron.clijsen@supsi.ch
dirk.vissers@uantwerpen.be