25

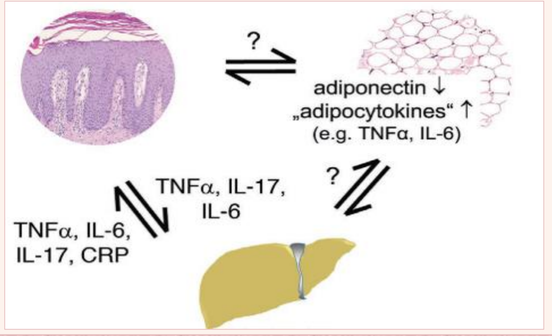
# Identification of risk factors associated with non-alcoholic fatty liver disease in psoriatic patients

K. Küçük[1], C. Moreno[2,3], H. Nijmi[1], M. Daoud[1], F. Willaert[1], F. Benhadou[1]

[1] Department of Dermatology, Hôpitaux Universitaires de Bruxelles (HUB), Université libre de Bruxelles, Brussels, Belgium.
[2] Department of Gastroenterology, Hepatopancreatology and Digestive Oncology, CUB Hôpital Erasme, Université Libre de Bruxelles, Brussels, Belgium.
[3] Laboratory of Experimental Gastroenterology, Université Libre de Bruxelles, Brussels, Belgium.

## Introduction

Non-alcoholic fatty liver disease (NAFLD) is a leading cause of chronic liver disease and affects up to 50% of psoriatic patients. NAFLD is defined by the presence of hepatic steatosis and the absence of other cause of hepatic fatty acid accumulation. Psoriasis and NAFLD share a pro-inflammatory cytokine milieu but it is still unclear whether these conditions are related by meta-inflammatory processes or by the metabolic syndrome (MetS).[1,2] The aim of our study was to better characterise the metabolic profile of psoriatic patients with NAFLD, to better screen these patients and to prevent the progression of hepatic steatosis to fibrosis or even cirrhosis of the liver.




Putative skin/liver/adipose tissue inflammatory network in psoriasis, adapted from Mantovani and al.[3]

## Material and Methods

***Study population***

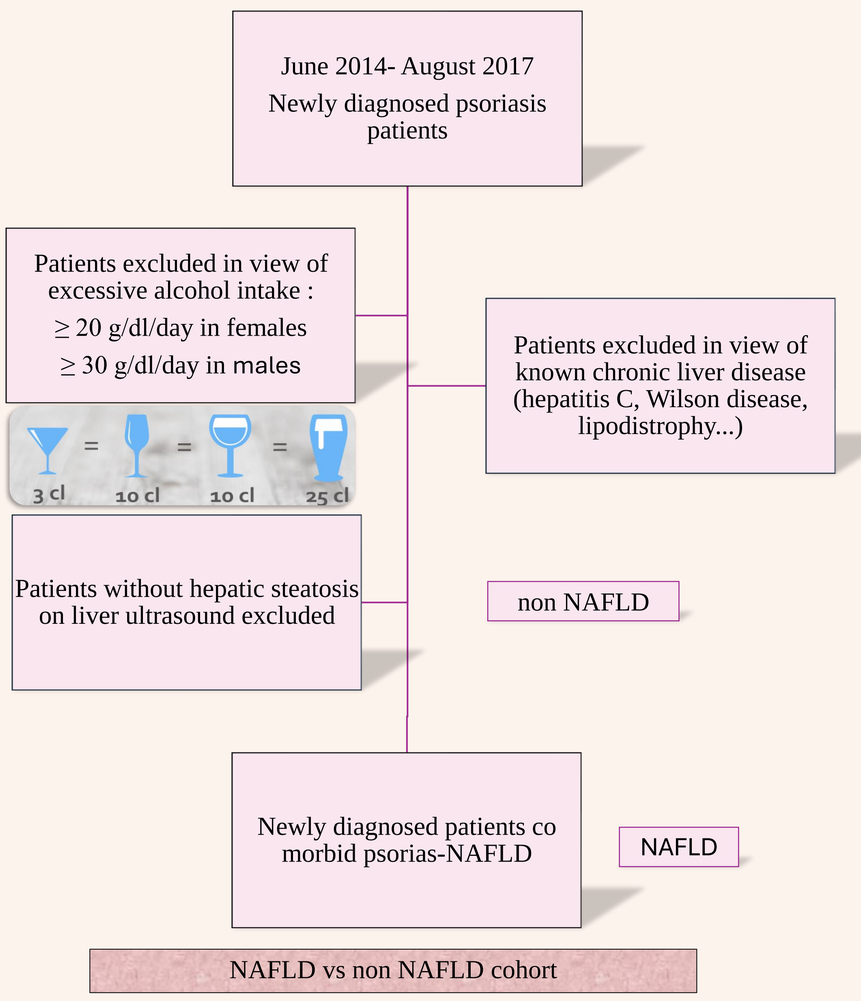
- We conducted a prospective single-centre, cross sectional study at Erasme Hospital (HUB) between June 2014 and August 2017
- Adults with psoriasis were recruited
- Baseline demographic data, clinical and anthropometric measurements were collected

***Analysis***

- Blood analysis including serum glucose, insulin, C-peptide, total cholesterol, HDL cholesterol, LDL cholesterol, CRP, ASAT, ALAT, GGT, bilirubin, alpha 2 microglobulin, haptoglobin, A1 apolipoprotein, hepatitis serology, HIV serology were checked.
- Fibrosis scores were calculated based on blood tests results and include Fibrotest, Aspartate-aminotransferase to Platelet ratio Index (APRI), FORNS and Fibrosis-4 (FIB4) score
- Liver ultrasonography
- Fibroscan

***NAFLD cohort*** [1,2]

- Hepatic steatosis (liver US)
- No excessive daily alcohol intake (>2u/day ♀ and > 3u/day ♂ )
- No chronic liver disease (viral hepatitis, Wilson's disease…)




## Results

100 patients were enrolled in the study. Of these, 43% were diagnosed with NAFLD and 65.1% were men. 57% did not have NAFLD, 57.9% were men. Body mass index (BMI) was significantly higher in patients with NAFLD (*p=0.029*). Abdominal circumference was also significantly higher in NAFLD patients (*p=0.005*). 56.4% had MetS, compared with 42.6% of the non-NAFLD population. PASI is higher in the non-NAFLD group but remains below 10 and is not statistically significant. Among the comorbidities, psoriatic arthritis was significantly higher in patients with NAFLD (*p=0.004*). Results for liver fibrosis were not significant, but 16.3% of NAFLD patients had fibrosis compared with 10.6% in the non-NAFLD cohort. The percentage of patients treated with methotrexate was the same in both cohorts. HDL levels were significantly lower (*p<0.001*) and C peptide levels significantly higher in the NAFLD patients (*p=0.036*). Liver tests were normal, and we found no significant difference between the two cohorts. The results of tests for liver fibrosis were not significant.

## Discussion

The prevalence of NAFLD in our cohort was 43%. In the literature, Van der Voort[4] found a prevalence of NAFLD of 46.2% compared with 33.3% in his control population. 62% of their psoriatic patients with NAFLD had MetS, which is slightly higher than in our NAFLD cohort. This may be explained by the exclusion of patients under the age of 55 in their study. In contrast, an Indian study[5] with 333 psoriasis patients found only 17% with NAFLD. This could be explained by differences in lifestyle and diet. Gisondi[6] emphasised that in the absence of alterations in liver tests, NAFLD cannot be ruled out. He found 50% NAFLD with normal liver tests. MetS and severe psoriasis both play a role in the development of NAFLD. In our cohort, 10-15% of psoriasis patients with have hepatic fibrosis, and similar results have been found in the literature. Patients with psoriatic arthritis have a higher risk of developing NAFLD, probably due to a higher inflammatory background in NAFLD patients. The toxicity of methotrexate remains controversial, with others emphasising the major impact of MetS on liver fibrosis. In our NAFLD and non-NAFLD cohorts, we found an almost similar percentage of patients treated with methotrexate, which does not seem to be a confounding factor. In the Gisondi study[6], NAFLD psoriasis patients had a more severe PASI than non-NAFLD psoriasis patients. In our study, the PASI was higher in the non-NAFLD group, but more than 96% of our patients were on treatment when the PASI was calculated, which explains the mean PASIs of less than 10.

## Conclusion

- Patients with psoriasis should be screened for metabolic syndrome and NAFLD.

- Clinical examination (blood pressure monitoring, measurement of waist circumference and BMI).
  Blood tests (platelets, CRP, liver enzymes, fasting glucose, insulin levels, lipid profile).

- If metabolic syndrome and NAFLD are suspected Hepatic ultrasonography (steatosis ?) and Fibrosis scores should be performed.

- Il-17 blockers represent an attractive therapeutic option in patients with NAFLD as it has been demonstrated that after 6 months of treatment with Secukinumab or Ixekizumab, NAFLD fibrosis and FIB4 scores were significantly reduced in a study of 65 patients with psoriasis and NAFLD[7].

## References

**1.** Galle PR, Forner A, Llovet JM, Mazzaferro V, Piscaglia F, Raoul JL, et al. EASL Clinical Practice Guidelines: Management of hepatocellular carcinoma. J Hepatol. 2018;69:182–236;
**2.** Torbator K, Poo S, Al-Rubaye T, Mapara L, Punjabi S, Al-Rubaye A, et al. Whether Screening for Non-alcoholic Fatty Liver Disease in Patients With Psoriasis Is Necessary: A Pilot Quality Improvement Project. Cureus. 2022;
**3.** Mantovani A, Gisondi P, Lonardo A, Targher G (2016) Relationship between non-alcoholic fatty liver disease and psoriasis: a novel hepato-dermal axis? Int J Mol Sci 17:217;
**4.** Van Der Voort EAM, Koehler EM, Dowlatshahi EA, Hofman A, Stricker BH, Janssen HLA, et al. Psoriasis is independently associated with nonalcoholic fatty liver disease in patients 55 years old or older: Results from a population-based study. J Am Acad Dermatol. 2014;70:517–24.
**5**. Madanagobalane S, Anandan S. The increased prevalence of non-alcoholic fatty liver disease in psoriatic patients: a study from South India. Australas J Dermatol. 2012;53:190–7
**6.** Gisondi P, Barba E, Girolomoni G. Non-alcoholic fatty liver disease fibrosis score in patients with psoriasis. J Eur Acad Dermatol Venereol. 2016;30:282–7.
**7**. Takamura S, Teraki Y, Katayama E, Kawaguchi T, Kawaguchi M, Nakano D, et al. Effects of interleukin-17 inhibitors on hepatic fibrosis index in patients with psoriasis and metabolic dysfunction-associated fatty liver disease: Directed acyclic graphs. Clin Mol Hepatol.