

Nutritional behavior and food pattern are sex-specific with higher salt intake and consumption of ultra-processed foods in a large cohort of NAFLD patients

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Introduction

Non-alcoholic fatty liver disease (NAFLD) is the leading cause of chronic liver disease. "Western" dietary patterns are generally linked to hepatic inflammation in NAFLD. High salt content and ultra-processed foods (UPF) are critical components of "Western diet", but scarce information exists on its particular impact on NAFLD.

Aim

Aim of this study is to analyze food pattern and specific nutritional behavior in NAFLD patients as a first step in specific nutritional intervention.

Method

310 clinically characterized NAFLD patients were prospectively included (04/21-11/22) in this single center study at a tertiary hospital.

All patients completed a nutrition questionnaire based on FFQ (DEGS - Studie zu Gesundheit Erwachsener in Deutschland¹) including 53 food groups for the calculation of dietary sodium consumption/day (DSC).

UPF consumption was classified by NOVA food classification².

Nutritional behavior was assessed by SINU (Italian Society of Human Nutrition)-Salt questionnaire³, Intuitive Eating Scale 2 (IES2)⁴ and Adult Eating Behaviour Questionnaire (AEBQ)⁵.

Conclusions

Consumption of ultra-processed food, daily salt intake and nutritional behavior is sex-specific in a large cohort of NAFLD patients. High daily salt intake is linked to higher liver enzymes and more pronounced liver steatosis. The findings of this study represent the basis for a prospective interventional trial.

References

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Contact information

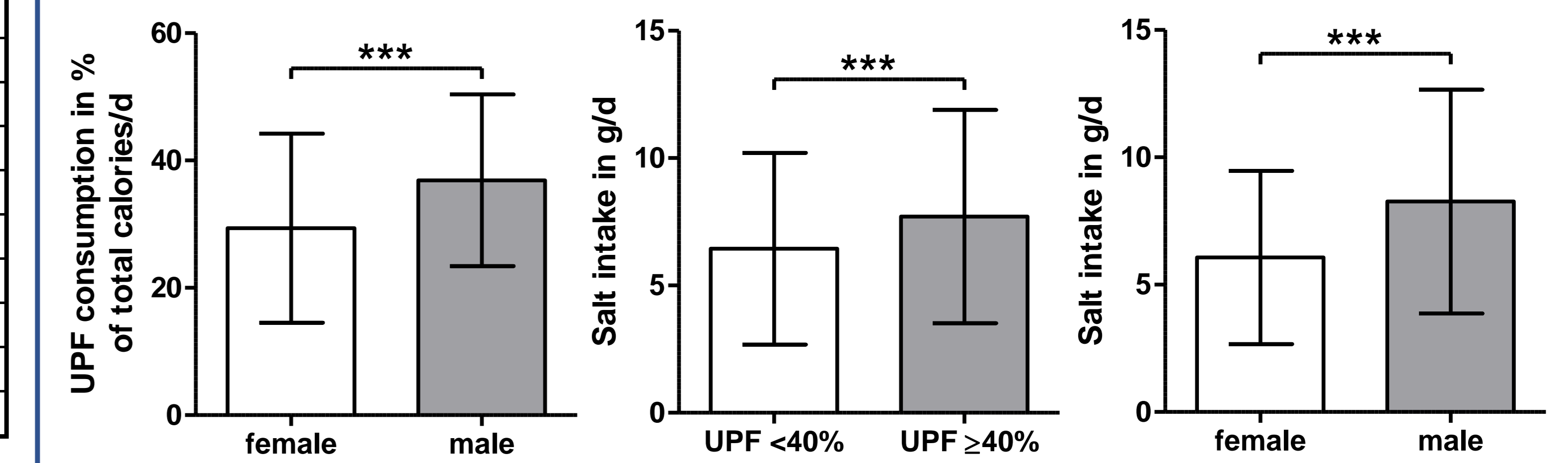
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Results

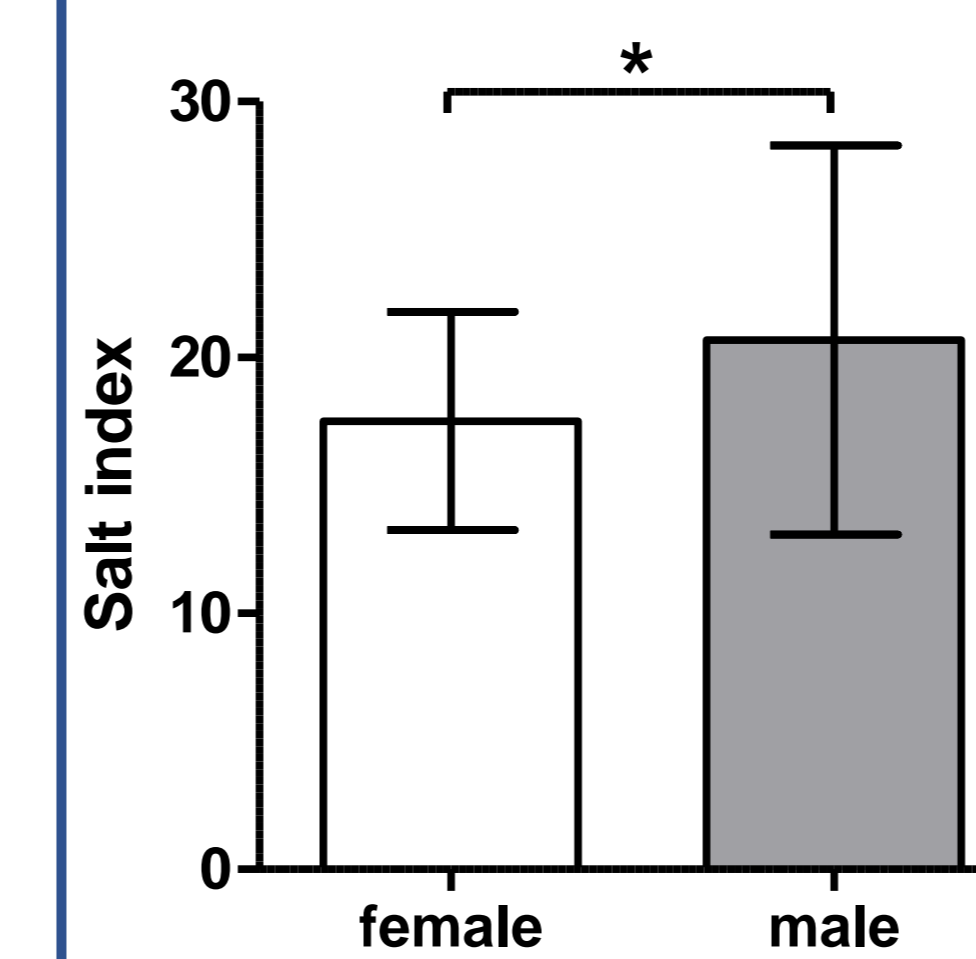
patient cohort	total	female	male
	n=310	57% (n=178)	43% (n=132)
age mean±SD	52,4 ± 12,5	52,3 ± 12,4	52,6 ± 12,6
BMI (kg/m ²) mean ± SD***	34,9 ± 8	36,5 ± 8,4	32,7 ± 6,8
TZDM % (n)	37,7% (117)	41% (73)	33,3% (44)
Arterial Hypertension % (n)	56,5% (175)	59% (105)	53% (70)
Dyslipidemia % (n)	24,2% (75)	23,6% (42)	25% (33)
AST (U/l) mean ± SD	37,6 ± 26,3	35,7 ± 30	40,2 ± 19,7
ALT (U/l) mean ± SD	47,3 ± 36,4	38,9 ± 31,9	58,8 ± 39
salt per day (g/day)***	7 ± 4,0	6,1 ± 3,4	8,3 ± 4,4
Stiffness mean ± SD*	8,6 ± 6,5	8 ± 5,5	9,4 ± 7,5
CAP mean ± SD*	317,6 ± 56,3	309,4 ± 60,2	328,1 ± 49,1

* p<0.05; *** p<0.001

UPF consumption and daily salt intake

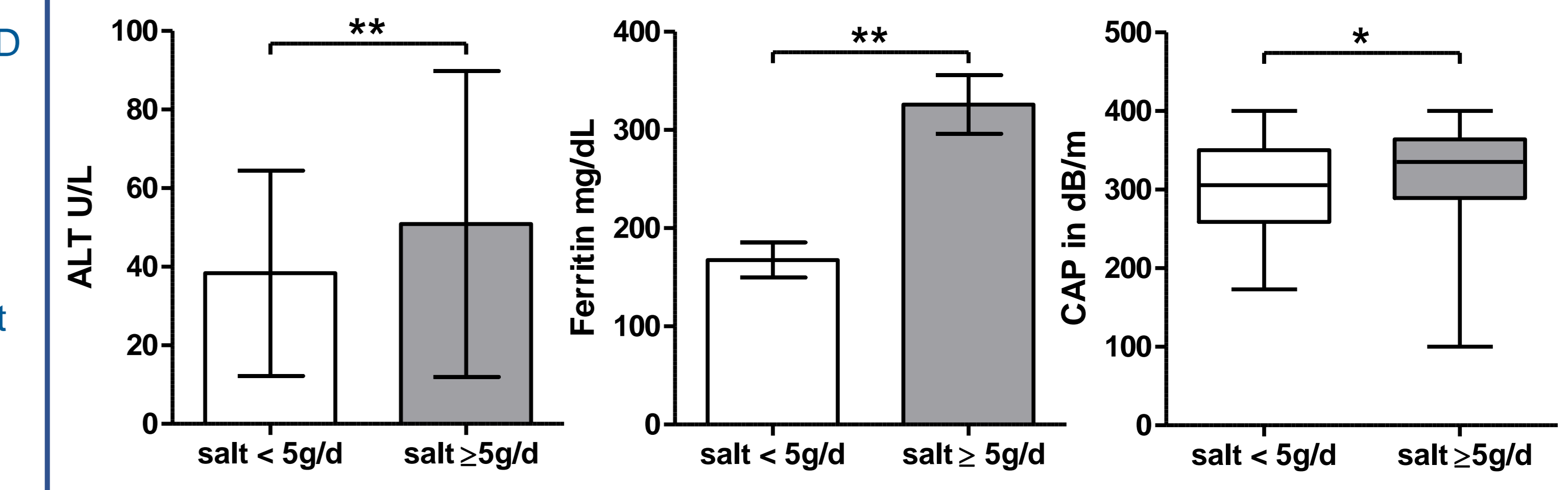


Salt related behaviour

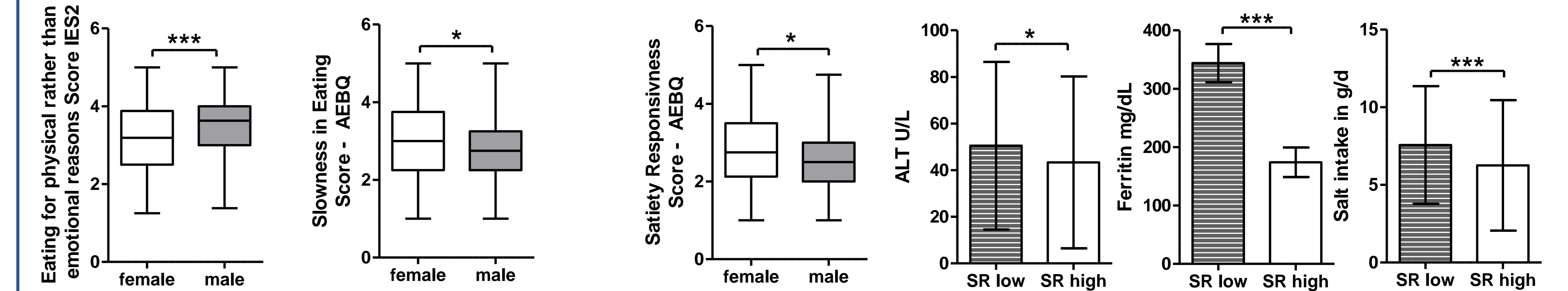


- Male NAFLD patients have higher UPF consumption and higher daily salt intake compared to female NAFLD patients.
- Male NAFLD patients indicate lower salt related behaviour with lower salt awareness.
- Patients with high daily salt intake had higher serum ALT, GGT and ferritin as well as higher weight and higher CAP values compared to low salt diet.

Higher salt consumption is associated to higher ALT, ferritin and more steatosis.



Sex-specific emotional eating behaviour



- Male NAFLD patients had a different emotional eating behaviour with higher consent to eating for physical rather than emotional reasons, but lower agreement to slowness in eating and satiety responsiveness (SR).
- Lower agreement to SR is associated with higher ALT, higher ferritin and higher salt intake.
- Nutritional behavior with high responsiveness on hunger and satiety cues (as a positive feedback signal) was linked to milder disease phenotype with lower ALT, AST, gGT, Ferritin, and lower DSC in this cohort.

