Pack-Years and Mediterranean Diet Adherence Refine Risk Stratification After Positive Non-Invasive Tests for Steatosis and Fibrosis in the Greek GRIPonMASH Cohort

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FACTS & FIGURES

Start date:	1 December 2023
End date:	30 November 2027
IHI funding:	14,035,277 €
Industry contribution:	8,955,636 €
Contributing partners:	3,242,500 €
Total Cost:	26,233,413 €
Project website:	griponmash.eu
Social media:	LinkedIn: GRIPonMASH

CHALLENGE

- MASLD affects ~30% of the world population but often stays undiagnosed until it progresses to MASH and fibrosis. The **GRIPonMASH (GoM) project** aims to improve current referral pathways for the early detection and risk stratification of MASLD.
- **Our question:** Does a brief lifestyle assessment help prioritise further evaluation after a positive non-invasive test (NIT) result?

APPROACH & METHODOLOGY

- **Greek GoM cohort:** 993 participants underwent Fibroscan examination.
- **Lifestyle domains:** mediterranean diet adherence (MEDAS), physical activity (METmin/week), sleep (b-PSQI), cumulative smoke exposure (pack-years).
- **NITs:** HSI (steatosis risk), FIB-4 and MAF-5 (fibrosis risk).

RESULTS

Variable	Steatosis status			Fibrosis status		
	No MASLD n=644	Severe steatosis n=349	P-value	No fibrosis n=927	Significant fibrosis n=66	P-value
Age, years	63.00 (14.00)	60.00 (14.00)	***<0.001***	62.00 (13.00)	60.00 (13.50)	*0.507*
Female sex, n (%)	401 (62.3)	179 (51.3)	***0.001***	555 (59.9)	24 (36.4)	***<0.001***
BMI, kg/m²	30.19 (6.99)	34.14 (7.84)	***<0.001***	31.25 (7.30)	36.17 (9.06)	***<0.001***
CAP, dB/m	232.50 (47.00)	314.00 (46.00)	***<0.001***	252.00 (71.00)	302.50 (64.50)	***<0.001***
LSM, kPa	4.30 (1.70)	5.40 (2.20)	***<0.001***	4.40 (1.70)	9.30 (1.20)	***<0.001***
HSI	39.97 (8.57)	46.64 (9.63)	***<0.001***	41.82 (9.66)	48.06 (11.75)	***<0.001***
FIB-4	1.23 (0.70)	1.07 (0.65)	***<0.001***	1.17 (0.69)	1.17 (0.83)	*0.572*
MAF-5	-0.15 (2.23)	1.48 (2.75)	***<0.001***	0.30 (2.62)	2.10 (2.76)	***<0.001***
Pack-years	1.22 (20)	5.38 (30)	***<0.001***	2.00 (20.25)	20.00 (43.75)	***<0.001***
b-PSQI score	4 (5)	5 (6)	*0.127*	5 (5)	5 (4)	*0.594*
METmin/week	925.5 (1257)	693 (1245.62)	***<0.001***	921 (1336.5)	478.5 (950.62)	***<0.001***
MEDAS	6 (2)	6 (3)	***0.009***	6 (2)	5 (2)	***0.002***

Table 1. Baseline characteristics of the Greek GoM population. *Continuous variables are presented as median (Interquartile range; IQR), while categorical as n (%). Severe steatosis was defined as CAP ≥280 dB/m and significant fibrosis as LSM ≥8 kPa. HSI, Hepatic Steatosis Index; FIB-4, Fibrosis-4 Index; MAF-5, Metabolic dysfunction-Associated Fibrosis-5; b-PSQI, brief Pittsburgh Sleep Quality Index; METmin/ week derived from short-IPAQ, short International Physical Activity Questionnaire; MEDAS, Mediterranean Diet Adherence Score.*

HSI showed moderate discrimination for severe steatosis (AUC 0.755); MAF-5 outperformed FIB-4 for significant fibrosis (AUC 0.748 vs 0.519). Pack-years were found to improve HSI discriminative ability, while MEDAS improved FIB-4.

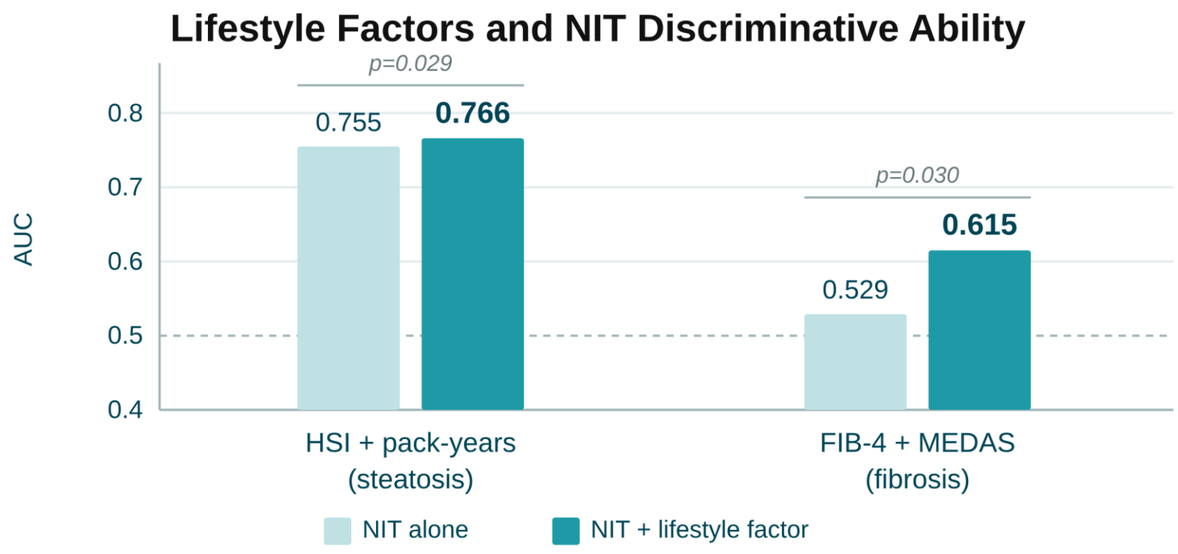


Figure 1. Significant improvements in NITs discriminative ability after addition of lifestyle factors. *AUCs were compared with DeLong's test.*

In the HSI-positive risk group, pack-years were associated with a higher risk of severe steatosis. In FIB-4 and MAF-5 intermediate risk groups, MEDAS was independently associated with significant fibrosis, whereas pack-years only in the FIB-4 intermediate group.

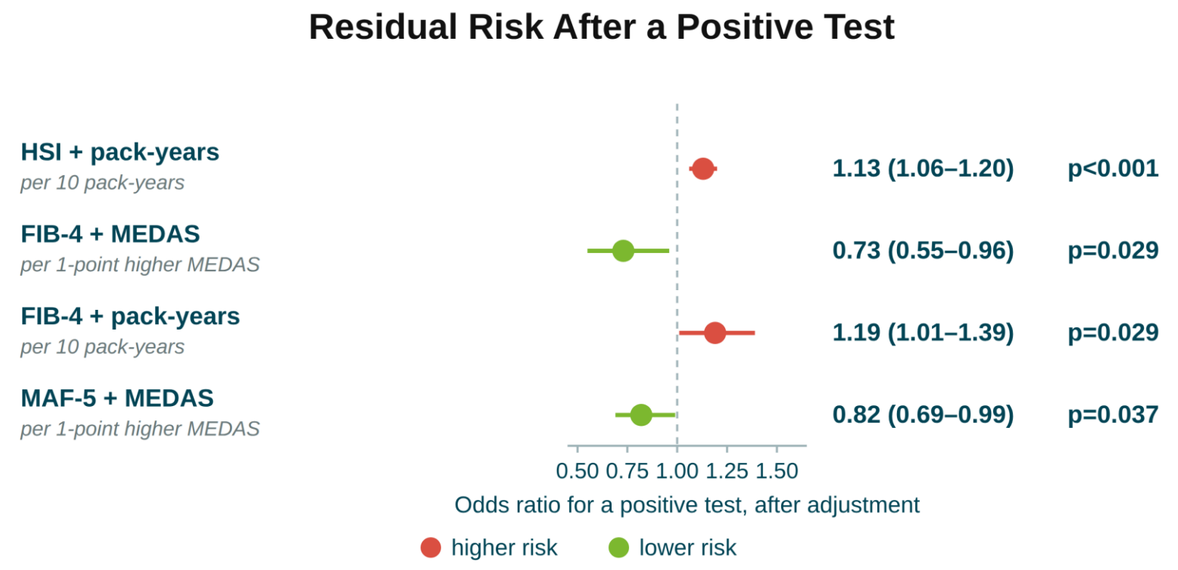


Figure 2. Significant associations between lifestyle factors and disease risk within NIT-positive risk groups.

CONCLUSION

Pack-years and MEDAS provided additional value beyond selected NITs. Among individuals with a positive NIT test, higher pack-years were associated with greater risk, whereas higher MEDAS were associated with lower risk of steatosis and/or fibrosis, suggesting that brief lifestyle assessment may help refine prioritization for further evaluation.

VALUE OF IHI COLLABORATION

Through the IHI public-private partnership, GRIPonMASH connected 27 partners from academic, clinical and industry backgrounds across Europe, providing cross-sector expertise and resources that would not have been possible otherwise. This enabled the 10,000-participant screening study and accelerated translation into practical MASLD screening and risk-stratification tools.

CAREER IMPACT

GRIPonMASH gave me the opportunity to contribute to a major European initiative involving a large clinical study and work closely with international partners. This experience enabled me to advance my research skills, exchange ideas with experts in the field, broaden my network, and build collaborations that may support future research projects.

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