

premium Hepashake

Premium Health Concepts Kft.

9400 Sopron, Verő J. u. 1.

E-mail: office@premiumhealth.hu

Tel.: +36-30/749-83-70

www.premiumshop.hu, www.majdieta.hu

A RÖVID TÁVÚ, HIPOKALÓRIÁS, MAGAS ROST - ÉS FEHÉRJETARTALMÚ DIÉTA JAVÍTTJA A MÁJ SZTEATÓZISÁT A CAP (CONTROLLED ATTENUATION PARAMETER) ÉRTÉKEKÉLÉS SZERINT

Célok: a nem alkoholos zsírmáj az egyik legelterjedtebb májbetegség, ami növeli a fibrosis és cirrhosis kockázatát. A jelenlegi standardkezelés az életmódbeli intervenciókra fókuszál. A tanulmány elsődleges célja annak értékelése volt, hogy a rövid távú, alacsony kalóriatartalmú étrend hatásait vizsgáljuk a máj szteatózisára, a CAP (controlled attenuation parameter) használatával.

Módszer: a prospektív megfigyeléses tanulmányban 60 zsírmájás páciens ellenőriztek a hipokalóriás, magas rost- és fehérjetartalmú diéta alatt, mely során 1000 kalóriát fogyasztottak naponta. A kiinduláskor, és 14 nap után is mérték a máj zsírtartalmát a CAP-t használva tranziens elasztográfiával, testösszetétel és bioelektromos impedancia analízissel, szérum májfunctiók tesztekkel és lipid profilokkal, standard klinikai kémiai vizsgálatokat alkalmazva.

Table 1 HEPAFast nutrient composition

	Per 100 g of powdered product	Per 30 g of powdered product in 350 ml milk (fat content 1.5%)
<i>Energy and nutrient content</i>		
Energy	324 kcal (1,359 kJ)	262 kcal (1,100 kJ)
Fat	4.8 g	7.0 g
Saturated fat	1.5 g	3.6 g
Total carbohydrate	5.8 g	19.0 g
Sugar	3.5 g	18.0 g
Fiber	24.0 g	7.0 g
Protein	51.0 g	27.0 g
Sodium	101 mg	195 mg
<i>Key ingredients</i>		
L-carnitine	2,000 mg	600 mg
Taurine	2,000 mg	600 mg
Omega-3-fatty acids	1,140 mg	342 mg
Choline	550 mg	165 mg
Oatmeal	20.0 g	6.0 g
β-glucan	5.6 g	1.7 g
Inulin	7.3 g	2.2 g
Oat fiber	5.0 g	1.5 g

premium Hepashake

Premium Health Concepts Kft.

9400 Sopron, Verő J. u. 1.

E-mail: office@premiumhealth.hu

Tel.: +36-30/749-83-70

www.premiumshop.hu, www.majdieta.hu

Eredmények: a medián életkor 56 év (25–78 év); 51,7% nő volt, és a medián BMI 31,9 kg/m² (22,4–44,8 kg/m²).

Table 2 Clinical characteristics of the study cohort

	At baseline	At follow-up	Relative reduction (%)	<i>P</i>
<i>Sociodemographic characteristics</i>				
<i>N</i> (men/women)	60 (29/31)			
Age (years)	56 (25–78)			
<i>Body composition</i>				
Body weight (kg)	95.1 (60.7–125.6)	90.5 (58.2–120.1)	–4.6 (–8.0–0.7)	<0.001
BMI (kg/m ²)	31.9 (22.4–44.8)	30.6 (21.3–43.5)	–4.7 (–8.1–0.6)	<0.001
BFM (kg)	34.5 (16.8–63.4)	31.8 (13.4–59.5)	–6.9 (–27.0–4.6)	<0.001
BFFM (kg)	58.2 (39.5–84.9)	55.3 (39.3–81.9)	–3.3 (–9.1–4.2)	<0.001
TBW (kg)	42.6 (28.9–62.2)	40.5 (28.8–60.0)	–3.3 (–9.1–4.1)	<0.001
WC (cm)	107 (78–127)	103 (76–128)	–4.1 (–9.2–2.2)	<0.001
VFI	13 (5–24)	12 (4–21)	–7.1 (–20.0–11.1)	<0.001
<i>Liver markers</i>				
CAP (dB/m)	295 (216–400)	266 (100–353)	–14.0 (–68.6–38.2)	<0.001
FLI	83 (7–99)	63 (4–98)	–21.3 (–74.0–0.0)	<0.001
LSM (kPa)	6.2 (1.5–11.9)	5.3 (1.5–12.0)	–11.7 (–70.5–43.6)	0.002
ALT (U/l)	38 (12–118)	36 (14–150)	0 (–73.1–122.2)	>0.05
AST (U/l)	25 (10–121)	24 (8–141)	0 (–80.2–464.0)	>0.05
AP (U/l)	74 (37–159)	64 (32–144)	–11.5 (–43.0–24.1)	<0.001
γ-GT (U/l)	37 (7–335)	26 (7–113)	–26.7 (–77.3–50.0)	<0.001
PChE (kU/l)	10.7 (6.6–17.0)	10.4 (6.7–15.3)	–3.8 (–22.6–19.2)	0.006
<i>Metabolic markers</i>				
Glucose (mg/dl)	89 (63–232)	84 (60–126)	–7.1 (–50.4–52.4)	<0.001
TG (mg/dl)	128 (60–419)	83 (48–183)	–34.1 (–84.0–35.9)	<0.001
TC (mg/dl)	214 (147–303)	163 (95–249)	–23.5 (–45.6–10.9)	<0.001
LDL cholesterol (mg/dl)	142 (78–226)	96 (45–193)	–25.3 (–53.1–41.0)	<0.001
HDL cholesterol (mg/dl)	50 (29–110)	45 (28–77)	–13.0 (–66.4–28.9)	<0.001
Uric acid (mg/dl)	6.1 (2.9–8.6)	5.6 (3.1–10.0)	–7.6 (–40.9–43.5)	0.024
SBP (mm Hg)	138 (110–175)	130 (104–184)	–5.6 (–28.6–40.5)	<0.001
DBP (mm Hg)	92 (74–125)	87 (72–120)	–4.5 (–34.2–18.8)	0.001

ALT, alanine aminotransferase; AP, alkaline phosphatase; AST, aspartate aminotransferase; BFFM, body fat free mass; BFM, body fat mass; BMI, body mass index; CAP, controlled attenuation parameter; DBP, diastolic blood pressure; FLI, fatty liver index; γ-GT, gamma-glutamyl transferase; HDL, high-density lipoprotein; LDL, low-density lipoprotein; LSM, liver stiffness measurement; *N*, number; PChE, pseudocholinesterase; SBP, systolic blood pressure; TBW, total body water; TC, total cholesterol; TG, triglycerides; VFI, visceral fat index; WC, waist circumference.
Significant *P* values are highlighted in bold.

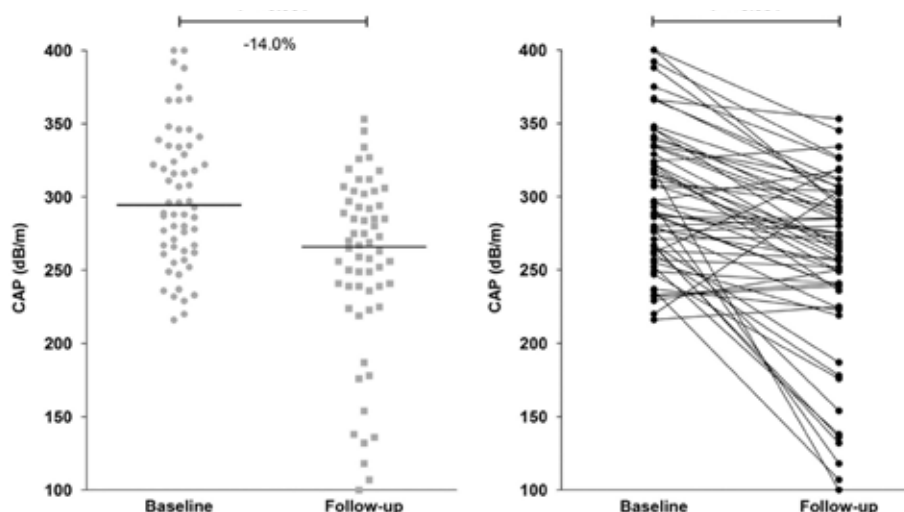


Figure 2 Changes of CAP in all 60 patients. (a) Median and individual CAP at baseline and follow-up at the end of the dietary intervention. The median CAP reduction was 47 dB/m in the entire cohort, corresponding to a relative median reduction of 14.0% ($P < 0.001$). (b) Absolute CAP in the individual patients during the dietary intervention.

premium Hepashake

Premium Health Concepts Kft.

9400 Sopron, Verő J. u. 1.

E-mail: office@premiumhealth.hu

Tel.: +36-30/749-83-70

www.premiumshop.hu, www.majdieta.hu

14 nap után szignifikáns CAP csökkenés (14,0%; $P < 0,001$) volt megfigyelhető 295 dB/m-ről (216-400 dB/m) 266 dB/m-re (100-353 dB/m).

Table 3 Distribution of CAP values across *PNPLA3* genotypes

<i>PNPLA3</i> variant p.I148M	[II]	[IM]	[MM]
Frequency (%)	60.0	31.7	8.3
<i>N</i>	36	19	5
CAP at baseline (dB/m)	291 (216–400)	296 (232–392)	339 (267–367)
CAP at follow-up (dB/m)	269 (100–353)	256 (154–334)	292 (132–306)
Absolute median CAP reduction (dB/m)	– 48 (–218–84)	– 39 (–123–57)	– 49 (–135– – 22)
Relative median CAP reduction (%)	– 13.8 (–68.6–38.2)	– 14.1 (–44.4–21.8)	– 14.4 (–50.6– – 7.6)

CAP, controlled attenuation parameter; I, isoleucine; M, methionine; *N*, number; *PNPLA3*, patatin-like phospholipase domain containing 3 (adiponutrin). The distribution of CAP values and CAP reduction across *PNPLA3* p.I148M genotypes does not differ (all *P* values > 0.05).

Table 4 Univariate and multivariate analysis of determinants of CAP reduction

	β coefficient	<i>P</i>
<i>Univariate analysis</i>		
Age	0.042	> 0.05
BFM at baseline	0.126	> 0.05
BMI at baseline	0.142	> 0.05
CAP at baseline	– 0.273	0.035
HDL cholesterol at baseline	– 0.335	0.009
Sex	0.178	> 0.05
TC at baseline	– 0.062	> 0.05
TG at baseline	0.206	> 0.05
<i>Multivariate analysis</i>		
CAP at baseline	– 0.285	0.020
HDL cholesterol at baseline	– 0.345	0.005

BFM, body fat mass; BMI, body mass index; CAP, controlled attenuation parameter; HDL, high-density lipoprotein; TC, total cholesterol; TG, triglycerides. Significant *P* values are highlighted in bold.

premium Hepashake

Premium Health Concepts Kft.

9400 Sopron, Verő J. u. 1.

E-mail: office@premiumhealth.hu

Tel.: +36-30/749-83-70

www.premiumshop.hu, www.majdieta.hu

Párhuzamosan a testsúly 4,6%-kal csökkent ($P < 0,001$), amiből 61,9% testzsír volt. Ráadásul a liver-stiffness (LF) ($P=0,002$), a γ -GT aktivitás, és a szérum lipid koncentráció is csökkent (mind $P < 0,001$).

Table 5 Comparison of patients with weight loss ≥ 5 and $< 5\%$

	Weight loss $\geq 5\%$		Weight loss $< 5\%$		
	At baseline	At follow-up	At baseline	At follow-up	P
<i>Sociodemographic characteristics</i>					
N (men/women)	26 (20/6)		34 (9/25)		***
Age (years)	50 (25–66)		58 (33–78)		**
<i>Body composition</i>					
Body weight (kg)	92.8 (61.9–125.6)	86.7 (58.6–115.7) ^{***}	95.6 (60.7–125.5)	92.1 (58.2–120.1) ^{***}	***
BMI (kg/m ²)	29.6 (22.4–41.5)	27.8 (21.3–38.5) ^{***}	32.4 (25.3–44.8)	30.9 (24.2–43.5) ^{***}	***
BFM (kg)	29.2 (17.0–49.5)	26.0 (13.4–44.1) ^{***}	36.7 (16.8–63.4)	34.8 (15.4–59.5) ^{***}	***
BFFM (kg)	68.4 (45.8–84.9)	66.6 (44.4–81.9) ^{***}	53.2 (39.5–77.1)	51.8 (39.3–78.9) ^{***}	***
TBW (kg)	50.1 (33.5–62.2)	48.8 (32.5–60.0) ^{***}	38.9 (28.9–56.4)	37.9 (28.8–57.8) ^{***}	***
WC (cm)	103 (82–124)	98 (77–120) ^{***}	107 (78–127)	104 (76–128) ^{***}	***
VFI	12 (5–24)	12 (5–21) ^{***}	14 (5–21)	13 (4–20) ^{***}	**
<i>Liver markers</i>					
CAP (dB/m)	295 (216–400)	251 (100–345) ^{***}	298 (220–392)	283 (136–353) ^{***}	n.s.
FLI	82 (30–99)	42 (14–93) ^{***}	83 (7–99)	71 (4–98) ^{***}	***
LSM (kPa)	5.9 (1.5–11.9)	5.0 (1.5–12.0) ^{**}	6.2 (3.8–9.7)	5.4 (3.1–10.0) [#]	n.s.
ALT (U/l)	38 (12–118)	31 (14–150) ^{n.s.}	37 (18–108)	40 (14–105) ^{n.s.}	n.s.
AST (U/l)	26 (10–121)	22 (11–141) ^{n.s.}	24 (10–46)	24 (8–46) ^{n.s.}	n.s.
γ -GT (U/l)	40 (12–335)	26 (7–99) ^{***}	36 (7–93)	25 (7–113) ^{***}	**
<i>Metabolic markers</i>					
Glucose (mg/dl)	87 (71–232)	74 (60–115) ^{***}	91 (63–164)	85 (72–126) ^{**}	**
TG (mg/dl)	138 (60–419)	72 (48–148) ^{***}	119 (63–340)	102 (49–183) ^{***}	***
TC (mg/dl)	219 (147–303)	161 (95–229) ^{***}	209 (149–302)	166 (103–249) ^{***}	*
LDL cholesterol (mg/dl)	143 (84–201)	98 (45–172) ^{***}	140 (78–226)	95 (47–193) ^{***}	n.s.
HDL cholesterol (mg/dl)	46 (33–110)	42 (28–75) ^{**}	54 (29–82)	46 (30–77) ^{***}	n.s.

ALT, alanine aminotransferase; AST, aspartate aminotransferase; BFFM, body fat free mass; BFM, body fat mass; BMI, body mass index; CAP, controlled attenuation parameter; FLI, fatty liver index; γ -GT, gamma-glutamyl transferase; HDL, high-density lipoprotein; LDL, low-density lipoprotein; LSM, liver stiffness measurement; N, number; TBW, total body water; TC, total cholesterol; TG, triglycerides; VFI, visceral fat index; WC, waist circumference.

P value between baseline and follow-up determined with the Wilcoxon-signed rank test: *** $P \leq 0.001$, ** $P \leq 0.01$, * $P \leq 0.05$, n.s. $P > 0.05$. P value between relative difference of baseline and follow-up value between both groups (weight loss $\geq 5\%$ and weight loss $< 5\%$) determined with the Mann-Whitney U test: *** $P \leq 0.001$, ** $P \leq 0.01$, * $P \leq 0.05$, n.s. $P > 0.05$.

premium Hepashake

Premium Health Concepts Kft.

9400 Sopron, Verő J. u. 1.

E-mail: office@premiumhealth.hu

Tel.: +36-30/749-83-70

www.premiumshop.hu, www.majdieta.hu

Table 6 Clinical baseline characteristics stratified according to the presence of diabetes

	Patients with diabetes	Patients without diabetes	<i>P</i>
<i>Sociodemographic characteristics</i>			
<i>N</i> (men/women)	14 (6/8)	46 (23/23)	> 0.05
Age (years)	61 (36–74)	54 (25–78)	0.038
<i>Body composition</i>			
Body weight (kg)	95.3 (74.5–119.8)	94.5 (60.7–125.5)	> 0.05
BMI (kg/m ²)	31.9 (27.0–44.8)	31.9 (22.4–43.5)	> 0.05
BFM (kg)	34.2 (18.9–53.4)	34.5 (16.8–63.4)	> 0.05
BFFM (kg)	55.4 (46.3–80.9)	61.6 (39.5–84.9)	> 0.05
TBW (kg)	40.6 (33.9–59.2)	45.1 (28.9–62.2)	> 0.05
WC (cm)	109 (96–127)	103 (78–124)	> 0.05
VFI	15 (11–21)	13 (5–24)	> 0.05
<i>Liver markers</i>			
CAP (dB/m)	337 (255–375)	288 (216–400)	0.025
FLI	86 (30–99)	76 (7–99)	> 0.05
LSM (kPa)	6.7 (1.5–9.9)	5.9 (3.3–11.9)	> 0.05
ALT (U/l)	42 (12–118)	38 (16–84)	> 0.05
AST (U/l)	26 (10–68)	24 (10–121)	> 0.05
AP (U/l)	75 (48–106)	74 (37–159)	> 0.05
γ-GT (U/l)	47 (17–93)	32 (7–335)	> 0.05
PChE (kU/l)	11.3 (7.9–17.0)	10.4 (6.6–15.0)	> 0.05
<i>Metabolic markers</i>			
Glucose (mg/dl)	115 (63–232)	86 (68–156)	< 0.001
TG (mg/dl)	152 (60–273)	122 (65–419)	> 0.05
TC (mg/dl)	210 (149–258)	220 (147–303)	> 0.05
LDL cholesterol (mg/dl)	139 (78–184)	142 (84–226)	> 0.05
HDL cholesterol (mg/dl)	50 (29–82)	51 (33–110)	> 0.05
Uric acid (mg/dl)	6.4 (4.6–8.5)	6.0 (2.9–8.6)	> 0.05
SBP (mm Hg)	131 (110–175)	138 (110–175)	> 0.05
DBP (mm Hg)	87 (79–175)	93 (74–125)	> 0.05

ALT, alanine aminotransferase; AP, alkaline phosphatase; AST, aspartate aminotransferase; BFFM, body fat free mass; BFM, body fat mass; BMI, body mass index; CAP, controlled attenuation parameter; DBP, diastolic blood pressure; FLI, fatty liver index; γ-GT, gamma-glutamyl transferase; HDL, high-density lipoprotein; LDL, low-density lipoprotein; LSM, liver stiffness measurement; N, number; PChE, pseudocholinesterase; SBP, systolic blood pressure; TBW, total body water; TC, total cholesterol; TG, triglycerides; VFI, visceral fat index; WC, waist circumference. Significant *P* values are highlighted in bold.

premium Hepashake

Premium Health Concepts Kft.

9400 Sopron, Verő J. u. 1.

E-mail: office@premiumhealth.hu

Tel.: +36-30/749-83-70

www.premiumshop.hu, www.majdieta.hu

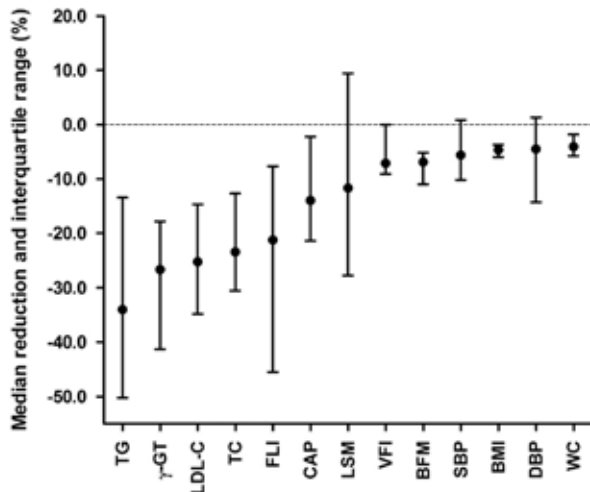


Figure 3 Summary of significant reductions of key parameters assessed during the dietary intervention. The values are displayed as medians, interquartile range, and ordered based on the extent of reduction. BFM, body fat mass; BMI, body mass index; CAP, controlled attenuation parameter; DBP, diastolic blood pressure; FLI, fatty liver index; γ-GT, gamma-glutamyl transferase; LDL-C, low-density lipoprotein cholesterol; LSM, liver stiffness measurement; SBP, systolic blood pressure; TC, total cholesterol; TG, triglycerides; VFI, visceral fat index; WC, waist circumference.

Következtetések: ez a tanulmány azt mutatja be, hogy első alkalommal hogy alkalmaztak non-invazív elasztográfiát a zsírmáj étrendi kezelésének, illetve gyors hatásainak nyomon követésére. A CAP javulása bekövetkezett 14 nap után a rövid távú alacsony kalóriás diétát alkalmazva, a testösszetétel paraméterek, a szérumban lévő lipidek, májenzimek csökkenésével együtt, rámutatva a máj lipidek körfolyamatának dinamikájára.

A módszer Magyarországon az orvosok által is elérhető Hepashake májdiétás program speciális gyógyászati célra szánt tápszerrel.

www.majdieta.hu

Forrás:

Anita Arslanow¹, Melanie Teutsch², Hardy Walle², Frank Grünhage¹, Frank Lammert¹ and Caroline S Stokes¹

1. ¹Department of Medicine II, Saarland University and Saarland University Medical Center, Homburg, Germany

2. ²Bodymed, Kerkel, Germany Correspondence: Frank Lammert, MD, PhD, Department of Medicine II, Saarland University Medical Center