

Supplementary Material to a Review Article Entitled: “The Impact of Transjugular Intrahepatic Portosystemic Shunt on Nutrition in Liver Cirrhosis Patients: A Systematic Review”

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Table 1 Changes in the nutritional status after transjugular intrahepatic portosystemic shunts insertion in cirrhotic patients

Reference	Design	Time	Exclusion criteria	Sample Size	Participant Characteristics	TIPS Indication	TIPS Model	PPG after TIPS	Follow-up after	TIPS dysfunction	Measure	Change
Allard et al. (2001) [27]	-	-	-	14 (71% ♂)	57.5±2.2 years, CP 9	RA (100%)	-	-		-		
				12					3 M		W	-0.1 kg (NSD)
				10					12 M		W	-0.3 kg (NSD)
				12					3 M		Dry W	+6.5 kg (p<0.001)
				10					12 M		Dry W	+7.4 kg (p=0.008)
				12					3 M		FM	-0.67 (NSD)
				10					12 M		FM	+4.39 (p<0.001)
				12					3 M		F10/F30	+1.74 (NSD)
				10					12 M		F10/F30	+5.14 (NSD)
				12					3 M		MRR	-0.25 (NSD)
				10					12 M		MRR	+0.2 (NSD)
Artru et al. (2020) [19]	RS	Jul 2011 – Mar 2017	-	179 (72% ♂)	58.2 years (IQR 11.9), CP 8, MELD 11.4	RA (47.5%), VB (52.5%)	8 and 10mm PTFE-C alone or with BMS	<10mmhg				
				128, 85					1-3, 6M	49 (38%), 31 (37%)	TPMT	+0.6, +2.1 (p=0.004, <0.001)
				128, 85					1-3, 6M	49 (38%), 31 (37%)	TPMA	+98, +244.9 (p<0.001, <0.001)
				128, 85					1-3, 6M	49 (38%), 31 (37%)	SFA	+9.6, +46.4 (p<0.001, <0.001)
				128, 85					1-3, 6M	49 (38%), 31 (37%)	VFA	-23, -22.3 (p<0.001, 0.009)
Gioia et al. (2019) [13]	RS	Jan 2015 – Jan 2016	Inadequate L, K, C or P functions, >75years, HCC, infection, SPB, PVT	27 (85% ♂)	58.07±6.7 years, CP 7.1, MELD 11.3	RA (56%), VB (44%)	10mm PTFE-C	-		-		
				27					9.8 M		SMI	+5.8 (p<0.001)
				27					9.8 M		MA	+3.2 (p=0.006)
Gioia et al. (2021) [14]	RS	Jan 2017 – Dec 2020	Inadequate L, K, C or P functions, >75years, HCC, infection, SPB, PVT	35 (80% ♂)	58.6±6.3 years, CP 7.9, MELD 11.4	RA (54%), VB (46%)	10mm PTFE-C	-		-		
									19M		SMI	+2.39 (p=0.04)
									19M		MA	+3.68 (p=0.003)
									19M		SATI	+15.9 (p=0.004)
									19M		VATI	-9.2 (p=0.007)
Holland-Fischer et al. (2010) [29]	-	-	-	11 (73% ♂)	58±4 years, MELD 10	RA (64%), RA+VB (36%)	PTFE-C	-		-		
				11					6M		W	+6.4 (p<0.001)
				11					6M		BMI	+2.2 (p=0.009)
				11					6M		BCM	+4.8 (p=0.002)
				11					6M		LBM	+5.7 (p=0.001)
				11					6M		FM	-1.1 (NSD)
Holland-Fischer et al. (2009) [28]	-	-	-	17	56 years, MELD 8	RA (59%), VB (29%), both (12%)	-	6mmHg		-		

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									13 M		W	+4.3 (NSD)
									13 M		BCM	+3.3 (p<0.05)
Jahangiri et al. (2019) [21]	RS	Apr 2004 – Dec 2015	-	76 (56.2% ♂)	54.2±11.2 years, MELD 16	RA/RH(52.6 %), VB (47.4%)	PTFE-C	-		-		
									13.5 M		SMA	+6.6 (p=0.002)
									13.5 M		MA psoas	+3.1 (p=0.02)
									13.5 M		MA paraspinal	+1.5 (NSD)
									13.5 M		MA abdom. wall	+4.7 (NSD)
									6,12,18M		SMA	+ (p<0.001, <0.1, <0.1)
Liu et al. (2022) [20]	RS	Aug 2016 – May 2020	Inadequate L or K functions, HCC (or other malignancy), infection after TIPS, CHD, uncontrolled DM or AH	224 (71% ♂)	54.3±11.6 years, CP 7.7, MELD 11.9	RA (14%), VB (86%)	8mm BM and 8 mm PTFE-C inside of the BMS	RA: 9 mmHg, VB: 12mmHg		23 (10%)		
				>48	Nonsarcopenic ♂				2, 5, 12 M		SMA	+0,5, +2.1, +3.2 (NSD, NSD, NSD)
				>48	Nonsarcopenic ♂				2, 5, 12 M		SMI	+0.3, +1.0, +1.5 (NSD, NSD, NSD)
				>48	Nonsarcopenic ♂				2, 5, 12 M		SFA	-0.5, -1.1, +14.7 (NSD, NSD, NSD)
				>48	Nonsarcopenic ♂				2, 5, 12 M		SFT	+0.9, +1.7, +1.9 (NSD, NSD, NSD)
				>48	Nonsarcopenic ♀				2, 5, 12 M		SMA	-1.0, +3.3, +2.8 (NSD, NSD, NSD)
				>48	Nonsarcopenic ♀				2, 5, 12 M		SMI	-0.4, +1.3, +1.1 (NSD, NSD, NSD)
				>48	Nonsarcopenic ♀				2, 5, 12 M		SFA	-6.5, +13.8, +9.3 (NSD, NSD, NSD)
				>48	Nonsarcopenic ♀				2, 5, 12 M		SFT	+0.5, +1.5, +2.4 (NSD, NSD, NSD)
				>95	Sarcopenic ♂				2, 5, 12 M		SMA	+3.6, +21.3, +22.8 (NSD, p<0.001, <0.001)
				>95	Sarcopenic ♀				2, 5, 12 M		SMA	+4.1, +17.7, +21.2 (p=0.03, <0.001, <0.001)
				>95	Sarcopenic ♂				2, 5, 12 M		SMI	+1.3, +7.3, +7.8 (p=0.13, <0.001, <0.001)
				>95	Sarcopenic ♀				2, 5, 12 M		SMI	+1.6, +6.9, +8.3 (p=0.02, <0.001, <0.001)
				>95	Sarcopenic ♂				2, 5, 12 M		SFA	+0.7, +20.9, +24.4 (NSD, p<0.001, <0.001)
				>95	Sarcopenic ♀				2, 5, 12 M		SFA	+1.8, +23.6, +28.2 (NSD, p<0.001, <0.001)
				>95	Sarcopenic ♂				2, 5, 12 M		SFT	+1.0, +3.5, +3.9 (p=0.05, <0.001, <0.001)
				>95	Sarcopenic ♀				2, 5, 12 M		SFT	-0.6, +1.7, +2.7 (NSD, NSD, <0.001)
				30	NoASC NoSarcoP ♂				12 M		AF W	NSD
				18	NoASC NoSarcoP ♀				12 M		AF W	NSD
				30	NoASC NoSarcoP ♂				12 M		AF BMI	NSD
				18	NoASC NoSarcoP ♀				12 M		AF BMI	NSD
				30	NoASC + SarcoP ♂				12 M		AF W	+7 (p=0.008)
				22	NoASC + SarcoP ♀				12 M		AF W	+5.5 (p=0.004)
				30	NoASC + SarcoP ♂				12 M		AF BMI	+2.4 (p=0.01)
				22	NoASC + SarcoP ♀				12 M		AF BMI	+2.2 (p=0.002)
Montomoli et al. (2010) [26]	PS	-	-	21	MELD 11	RA (57%), VB (33%), both (10%)	PTFE-C	6mmHg		3 (14%)		
									13M		BMI	+1.2 (NSD)
									13M		FM	-1.6 (NSD)

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				21	UNW			6.3mmHg	13M		DLM	+0.8 (NSD)
				12					13M		BMI	+2.7 (NSD)
				12					13M		FM	-2.3 (NSD)
				12					13M		DLM	+1.8 (p=0.03)
				9					13M		BMI	+1.5 (NSD)
				9					13M		FM	-1.0 (NSD)
				9					13M		DLM	-0.3 (NSD)
Nolte et al. (2003) [25]	PS	1998-2000	tense ascites, first bleeding episode, non-abstinence	31	CP A - 50-53%, CP B 37-38%, CP C 10-12%	RA, VB	-	-		-		
				19, 15♂					3, 9M		W	+0.6, +2.2 (NSD, p=0.04)
				19, 15♂					3, 9M		BMI	+0.2, +0.7 (NSD, p=0.04)
				19, 15♂					3, 9M		AF W	+2.1, +3.6 (NSD, p=0.02)
				19, 15♂					3, 9M		AF BMI	+0.6, +1.2 (NSD, p=0.02)
				12, 9♀					3, 9M		W	-0.8, +0.9 (NSD, NSD)
				12, 9♀					3, 9M		BMI	-0.3, -0.4 (NSD, NSD)
				12, 9♀					3, 9M		AF W	+2.6, +4.8 (p=0.02, 0.003)
				12, 9♀					3, 9M		AF BMI	+1.1, +2.2 (p=0.004, 0.001)
Pang et al. (2021) [22]	RS	Nov 2017 – Aug 2018	C, K, P functions, HE	77	54.1±12.2 years	RA, VB	PTFE-C	-		-		
									13M		W	+2.1 (p<0.01)
									13M		BMI	+0.8 (p<0.01)
									1-6M		W	+ (p<0.05)
									7-12M		W	+ (p<0.05)
									13-36M		W	+ (p<0.05)
									>36M		W	+ (NSD)
									1-6M		BMI	+ (p<0.05)
									7-12M		BMI	+ (p<0.05)
									13-36M		BMI	+ (p<0.05)
									>36M		BMI	+ (NSD)
Plauth et al. (2004) [24]	PS	-	-	21 (62% ♂)	60 years	RA (33%), VB (43%), both (24%)	-			-		
				21				15.5mmHg	6M		W	+8 (0.001)
				21				15.5mmHg	6M		BMI	+3.9 (p<0.001)
				21				15.5mmHg	6M		MAMA	+5.4 (p=0.001)
				21				15.5mmHg	6M		MAFA	+2 (NSD)
				21				15.5mmHg	6M		BCM	+4.4 (p<0.025)
				16				11.5mmhg	12M		W	+0.9 (p<0.01)

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				16				11.5mmhg	12M		BMI	+ (p<0.025)
				16				11.5mmhg	12M		MAMA	+ (p<0.001)
				16				11.5mmhg	12M		BCM	+ (NSD)
								g				
Thomsen et al. (2012) [30]	-	-	-	25 (60% ♂)	53 years, MELD 8.6	RA (68%), VB (20%), both (12%)	-	6mmHg		-		
									6M		W	+5 (NSD)
									6M		BMI	+1 (NSD)
									6M		FM*	-1.8 (NSD)
									6M		BCM	+3.6 (p=0.03)
Trotter et al. (1998) [23]	RS	Nov 1994 – Aug 1997	K and P functions, HE	35 (69% ♂)	54.0±9.2 years, CP B 86%, CP C 14%	RA	10mm	8.1mmHg				
									2M		W	-6.1 (p<0.05)
									8.8M		W	+5.5 (p<0.05)
Tsien et al. (2012) [15]	-	Jan 2008 – Dec 2011	C, K, P functions, malignancy or DM, medication affecting muscle turnover	57 (63% ♂)	55.5±8.1 years, CP 8.9, MELD 13.9	RA (72%), VB (25%), both (3%)	PTFE-C	7mmHg	13.5M	-		
											BMI	+1.2 (NSD)
											SMA	+7.4 (p<0.05)
											MA	-1.1 (NSD)
											VAT	-7.6 (NSD)
											SAT	-9.7 (p<0.05)

Footnote: **AF** – ascitic-free, **AH** – arterial hypertension, **ASC** – ascites, **BCM** – body cell mass (kg), **BM(S)** – bare metallic (stent), **BMI** – body mass index (kg/m²), **C** – cardiac, **CHD** – coronary heart disease, **CP** – Child-Pugh score, **DM** – diabetes mellitus, **DLM** – dry lean mass (kg), **FM** – fat mass (% of total body weight/*kg), **F10/F30** – force of m. adductor policis (%), **HCC** – hepatocellular carcinoma, **K** – kidney, **kg** – kilogram, **L** – liver, **M** – months, **MA** – muscle attenuation (Hounsfield units), **MAFA** – mid-arm fat area (cm²), **MAMA** – mid-arm muscle area (cm²), **MELD** – model for end-stage liver disease, **MRR** – muscle relaxation rate (m. adductor policis) (%), **mmHg** – millimeters of mercury, **NDS** – no significant difference, **OW** – overweight, **P** – pulmonary, **PTFE-C** – polytetrafluoroethylene cover, **PPG** – portal pressure gradient, **PS** – prospective, **PVT** – portal vein thrombosis, **RA** – refractory/recurrent ascites, **RH** – refractive hydrothorax, **RS** – retrospective, **SAT** – subcutaneous adipose tissue (cm³/3 mm), **SATI** – subcutaneous adipose tissue index (cm²/m²), **SFA** – subcutaneous fat area (cm²), **SFT** – subcutaneous fat thickness (cm), **SMA** – skeletal muscle area (cm²), **SMI** – skeletal muscle index (cm²/m²), **SPB** – spontaneous bacterial peritonitis, **TPMA** – total psoas muscle area (mm²), **TPMT** – transversal right psoas muscle thickness at the umbilical level/height (mm/m), **TIPS** – transjugular intrahepatic portosystemic shunt, **Tx** – liver transplantation, **UNW** – under or normal weight, **VAT** – visceral adipose tissue (cm³/3 mm), **VATI** - visceral adipose tissue index (cm²/m²), **VB** – variceal bleeding, **VFA** – visceral fat area (cm²), **W** – weight (kg), **μ** – mean, - – no specific information. Continuous variables are expressed as means ± standard deviations (or standard error of mean) or as medians and interquartile ranges (**IQR**).