

Table S1 Factors associated with osteoporosis in patients with primary biliary cholangitis

| Variable | Univariate | | Multivariate | |
|---------------------------------------|-----------------------|---------|----------------------|---------|
| | OR (95%CI) | P-value | OR (95%CI) | P-value |
| Female | 1.840 (0.569–5.945) | 0.308 | | |
| Age (years) | 1.098 (1.046–1.153) | <0.001 | 1.090 (1.034–1.148) | 0.001 |
| BMI (kg/m ²) | 0.762 (0.653–0.890) | 0.001 | 0.823 (0.690–0.982) | 0.031 |
| Liver cirrhosis | 3.511 (0.991–12.436) | 0.052 | | |
| Age at diagnosis (years) | 1.063 (1.021–1.106) | 0.003 | | |
| Duration of disease (years) | 1.056 (0.993–1.123) | 0.080 | | |
| AST (IU/L) | 0.997 (0.967–1.029) | 0.873 | | |
| ALT (IU/L) | 0.953 (0.906–1.003) | 0.064 | | |
| ALP (IU/L) | 1.000 (0.998–1.003) | 0.742 | | |
| GGT (IU/L) | 0.998 (0.991–1.005) | 0.517 | | |
| Total bilirubin (mg/dL) | 1.105 (0.655–1.865) | 0.708 | | |
| Albumin (g/dL) | 0.277 (0.102–0.755) | 0.012 | | |
| M2BPGi (C.O.I) | 1.125 (0.881–1.436) | 0.347 | | |
| IGF-1 (ng/mL) | 0.980 (0.967–0.993) | 0.004 | | |
| BCAA (μmol/L) | 0.994 (0.989–0.999) | 0.018 | | |
| TRACP-5b (mU/dL) | 1.002 (0.999–1.004) | 0.218 | | |
| Total P1NP (ng/mL) | 1.003 (0.983–1.024) | 0.746 | | |
| SMI (kg/m ²) | 0.266 (0.144–0.491) | <0.001 | | |
| Handgrip strength (kg) | 0.777 (0.693–0.870) | <0.001 | | |
| Lumbar spine BMD (g/cm ²) | 0.000 (0.000–0.005) | <0.001 | | |
| Femoral neck BMD (g/cm ²) | 0.000 (0.000–0.000) | <0.001 | | |
| Total hip BMD (g/cm ²) | 0.000 (0.000–0.000) | <0.001 | | |
| Sarcopenia | 10.000 (3.778–26.470) | <0.001 | 4.126 (1.280–13.297) | 0.018 |
| Vertebral fracture | 6.175 (2.251–16.939) | <0.001 | | |

ALP, alkaline phosphatase; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BCAA, branched-chain amino acids; BMD, bone mineral density; BMI, body mass index; CI, confidence interval; GGT, gamma-glutamyltransferase; IGF-1, insulin-like growth factor 1; M2BPGi, Mac-2 binding protein glycosylation isomer; OR, odds ratio; P1NP, procollagen type I N-terminal propeptide; skeletal muscle mass index; SMI, skeletal muscle mass index; TRACP-5b, tartrate resistant acid phosphatase-5b.

Table S2 Factors associated with sarcopenia in patients with primary biliary cholangitis

| Variable | Univariate | | Multivariate | |
|---------------------------------------|----------------------|---------|-----------------------|---------|
| | OR (95%CI) | P-value | OR (95%CI) | P-value |
| Female | 2.000 (0.541–7.388) | 0.298 | | |
| Age (years) | 1.053 (1.009–1.099) | 0.019 | | |
| BMI (kg/m ²) | 0.695 (0.576–0.839) | <0.001 | 0.708 (0.568–0.883) | 0.002 |
| Liver cirrhosis | 4.857 (1.351–17.457) | 0.015 | | |
| Age at diagnosis (years) | 1.051 (1.009–1.095) | 0.018 | | |
| Duration of disease (years) | 0.998 (0.932–1.070) | 0.963 | | |
| AST (IU/L) | 1.015 (0.985–1.045) | 0.327 | | |
| ALT (IU/L) | 0.966 (0.918–1.016) | 0.182 | | |
| ALP (IU/L) | 1.001 (0.998–1.004) | 0.542 | | |
| GGT (IU/L) | 0.999 (0.992–1.006) | 0.709 | | |
| Total bilirubin (mg/dL) | 1.626 (0.868–3.049) | 0.129 | | |
| Albumin (g/dL) | 0.210 (0.072–0.611) | 0.004 | | |
| M2BPGi (C.O.I) | 1.362 (1.013–1.831) | 0.041 | | |
| IGF-1 (ng/mL) | 0.985 (0.972–0.999) | 0.033 | | |
| BCAA (μmol/L) | 0.997 (0.993–1.002) | 0.215 | | |
| TRACP-5b (mU/dL) | 1.001 (0.998–1.004) | 0.432 | | |
| Total P1NP (ng/mL) | 0.999 (0.978–1.021) | 0.935 | | |
| SMI (kg/m ²) | 0.024 (0.005–0.108) | <0.001 | | |
| Handgrip strength (kg) | 0.617 (0.505–0.755) | <0.001 | | |
| Lumbar spine BMD (g/cm ²) | 0.004 (0.000–0.069) | <0.001 | | |
| Femoral neck BMD (g/cm ²) | 0.001 (0.000–0.036) | <0.001 | | |
| Total hip BMD (g/cm ²) | 0.000 (0.000–0.025) | <0.001 | | |
| Osteoporosis | 8.875 (3.376–23.334) | <0.001 | 3.420 (1.057–11.067) | 0.040 |
| Vertebral fracture | 9.518 (3.340–27.126) | <0.001 | 10.936 (2.678–44.663) | 0.001 |

ALP, alkaline phosphatase; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BCAA, branched-chain amino acids; BMD, bone mineral density; BMI, body mass index; CI, confidence interval; GGT, gamma-glutamyltransferase; IGF-1, insulin-like growth factor 1; M2BPGi, Mac-2 binding protein glycosylation isomer; OR, odds ratio; P1NP, procollagen type I N-terminal propeptide; skeletal muscle mass index; SMI, skeletal muscle mass index; TRACP-5b, tartrate resistant acid phosphatase-5b.

Table S3 Comparison of clinical characteristics between female patients with and without osteoporosis

| Variable | All patients | Osteoporosis | Non-osteoporosis | P-value |
|---------------------------------------|------------------|------------------|------------------|---------|
| Patients, n (%) | 96 | 29 (30.2) | 67 (69.8) | |
| Age (years) | 67.0 (57.0–73.0) | 71.0 (66.5–77.0) | 63.0 (55.0–70.0) | <0.001 |
| BMI (kg/m ²) | 22.3 (20.1–24.9) | 20.3 (18.6–22.8) | 22.7 (20.7–26.0) | 0.002 |
| Liver cirrhosis, n (%) | 7 (7.3) | 5 (17.2) | 2 (3.0) | 0.014 |
| Age at diagnosis (years) | 60.5 (50.0–68.0) | 64.0 (54.0–72.0) | 57.0 (49.0–66.0) | 0.019 |
| Duration of disease (years) | 3.0 (1.0–8.0) | 5.0 (2.0–13.0) | 2.0 (1.0–6.0) | 0.038 |
| Menopause, n (%) | 83 (86.5) | 28 (96.6) | 55 (82.1) | 0.057 |
| Duration of menopause (years) | 15.0 (6.3–24.0) | 23.0 (14.5–27.0) | 13.0 (3.0–18.0) | <0.001 |
| AST (IU/L) | 25 (21–30) | 26 (23–30) | 24 (20–29) | 0.565 |
| ALT (IU/L) | 20 (14–24) | 18 (14–22) | 20 (14–24) | 0.525 |
| ALP (IU/L) | 282 (216–348) | 271 (206–319) | 290 (224–363) | 0.202 |
| GGT (IU/L) | 38 (24–60) | 31 (25–54) | 41 (23–65) | 0.287 |
| Total bilirubin (mg/dL) | 0.6 (0.5–0.8) | 0.5 (0.4–0.7) | 0.6 (0.5–0.8) | 0.092 |
| Albumin (g/dL) | 4.1 (3.9–4.3) | 4.0 (3.9–4.3) | 4.2 (3.9–4.4) | 0.037 |
| M2BPGi (C.O.I) | 0.87 (0.57–1.36) | 1.13 (0.62–1.66) | 0.82 (0.57–1.23) | 0.055 |
| IGF-1 (ng/mL) | 89 (61–112) | 61 (46–101) | 95 (68–116) | 0.002 |
| BCAA (μmol/L) | 412 (356–460) | 379 (326–430) | 433 (379–482) | 0.013 |
| TRACP-5b (mU/dL) | 351 (240–475) | 384 (281–498) | 343 (231–477) | 0.402 |
| P1NP (ng/mL) | 47 (34–58) | 47 (33–59) | 48 (34–59) | 0.780 |
| SMI (kg/m ²) | 6.01 (5.32–6.48) | 5.30 (4.97–5.86) | 6.11 (5.74–6.57) | <0.001 |
| Handgrip strength (kg) | 21.8 (17.2–23.8) | 17.0 (14.7–20.3) | 22.7 (19.3–25.5) | <0.001 |
| Lumbar spine BMD (g/cm ²) | 1.03 (0.87–1.17) | 0.80 (0.71–0.91) | 1.09 (0.97–1.21) | <0.001 |
| Femoral neck BMD (g/cm ²) | 0.74 (0.67–0.84) | 0.63 (0.58–0.69) | 0.77 (0.72–0.89) | <0.001 |
| Total hip BMD (g/cm ²) | 0.79 (0.71–0.88) | 0.67 (0.60–0.71) | 0.84 (0.77–0.93) | <0.001 |
| Sarcopenia, n (%) | 24 (25.0) | 16 (55.2) | 8 (11.9) | <0.001 |
| Vertebral fracture, n (%) | 16 (16.7) | 10 (34.5) | 6 (9.0) | 0.002 |

Values are shown as median (interquartile range) or number (percentage). Statistical analysis was performed using the chi-squared test or the Mann-Whitney U test, as appropriate. ALP, alkaline phosphatase; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BCAA, branched-chain amino acids; BMD, bone mineral density; BMI, body mass index; GGT, gamma-glutamyltransferase; IGF-1, insulin-like growth factor 1; M2BPGi, Mac-2 binding protein glycosylation isomer; P1NP, procollagen type I N-terminal propeptide; SMI, skeletal muscle mass index; TRACP-5b, tartrate-resistant acid phosphatase 5b.

Table S4 Comparison of clinical characteristics between female patients with and without sarcopenia

| Variable | Sarcopenia | Non-sarcopenia | P-value |
|---------------------------------------|------------------|------------------|---------|
| Patients, n (%) | 24 (25.0) | 72 (75.0) | |
| Age (years) | 73.0 (65.0–76.8) | 65.5 (56.0–71.0) | 0.008 |
| BMI (kg/m ²) | 19.6 (18.0–21.5) | 22.8 (20.7–25.9) | <0.001 |
| Liver cirrhosis, n (%) | 4 (16.7) | 3 (4.2) | 0.041 |
| Age at diagnosis (years) | 66.5 (51.5–73.0) | 57.0 (50.0–66.0) | 0.022 |
| Duration of disease (years) | 3.5 (1.0–8.8) | 2.0 (1.0–8.0) | 0.698 |
| Menopause, n (%) | 22 (91.7) | 61 (84.7) | 0.389 |
| Duration of menopause (years) | 22.5 (13.3–28.8) | 13.5 (5.0–20.0) | 0.006 |
| AST (IU/L) | 25 (22–32) | 26 (20–30) | 0.946 |
| ALT (IU/L) | 18 (14–21) | 20 (14–24) | 0.358 |
| ALP (IU/L) | 284 (217–337) | 281 (216–352) | 0.800 |
| GGT (IU/L) | 34 (21–60) | 39 (24–63) | 0.449 |
| Total bilirubin (mg/dL) | 0.5 (0.5–0.7) | 0.6 (0.5–0.8) | 0.144 |
| Albumin (g/dL) | 4.0 (3.8–4.2) | 4.2 (3.9–4.4) | 0.077 |
| M2BPGi (C.O.I) | 1.27 (0.70–1.79) | 0.83 (0.55–1.22) | 0.008 |
| IGF-1 (ng/mL) | 77 (48–104) | 94 (66–114) | 0.067 |
| BCAA (μmol/L) | 381 (326–493) | 421 (377–458) | 0.331 |
| TRACP-5b (mU/dL) | 390 (215–510) | 344 (240–469) | 0.682 |
| P1NP (ng/mL) | 38 (31–61) | 48 (36–58) | 0.268 |
| SMI (kg/m ²) | 5.08 (4.84–5.92) | 6.27 (5.88–6.57) | <0.001 |
| Handgrip strength (kg) | 16.6 (14.1–17.2) | 22.6 (20.0–25.2) | <0.001 |
| Lumbar spine BMD (g/cm ²) | 0.88 (0.64–0.74) | 1.08 (0.92–1.21) | <0.001 |
| Femoral neck BMD (g/cm ²) | 0.68 (0.64–0.74) | 0.77 (0.70–0.89) | <0.001 |
| Total hip BMD (g/cm ²) | 0.72 (0.66–0.78) | 0.82 (0.73–0.92) | 0.001 |
| Osteoporosis, n (%) | 16 (66.7) | 13 (18.1) | <0.001 |
| Vertebral fracture, n (%) | 10 (41.7) | 6 (8.3) | <0.001 |

Values are shown as median (interquartile range) or number (percentage). Statistical analysis was performed using the chi-squared test or the Mann-Whitney U test, as appropriate. ALP, alkaline phosphatase; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BCAA, branched-chain amino acids; BMD, bone mineral density; BMI, body mass index; GGT, gamma-glutamyltransferase; IGF-1, insulin-like growth factor 1; M2BPGi, Mac-2 binding protein glycosylation isomer; P1NP, procollagen type I N-terminal propeptide; SMI, skeletal muscle mass index; TRACP-5b, tartrate-resistant acid phosphatase 5b.

Table S5 Factors associated with osteoporosis in female patients with primary biliary cholangitis

| Variable | Univariate | | Multivariate | |
|---------------------------------------|----------------------|---------|----------------------|---------|
| | OR (95%CI) | P-value | OR (95%CI) | P-value |
| Age (years) | 1.088 (1.034–1.145) | 0.001 | 1.074 (1.018–1.132) | 0.008 |
| BMI (kg/m ²) | 0.790 (0.676–0.924) | 0.003 | | |
| Liver cirrhosis | 6.771 (1.230–37.262) | 0.028 | | |
| Age at diagnosis (years) | 1.054 (1.010–1.099) | 0.015 | | |
| Duration of disease (years) | 1.055 (0.989–1.125) | 0.107 | | |
| Menopause | 6.109 (0.756–49.398) | 0.090 | | |
| Duration of menopause (years) | 1.092 (1.039–1.148) | 0.001 | | |
| AST (IU/L) | 1.002 (0.964–1.041) | 0.925 | | |
| ALT (IU/L) | 0.959 (0.907–1.014) | 0.145 | | |
| ALP (IU/L) | 1.000 (0.997–1.003) | 0.975 | | |
| GGT (IU/L) | 0.996 (0.988–1.005) | 0.424 | | |
| Total bilirubin (mg/dL) | 1.332 (0.677–2.621) | 0.406 | | |
| Albumin (g/dL) | 0.247 (0.075–0.818) | 0.022 | | |
| M2BPGi (C.O.I) | 1.197 (0.881–1.627) | 0.250 | | |
| IGF-1 (ng/mL) | 0.978 (0.963–0.993) | 0.005 | | |
| BCAA (μmol/L) | 0.996 (0.991–1.001) | 0.140 | | |
| TRACP-5b (mU/dL) | 1.001 (0.999–1.004) | 0.375 | | |
| Total P1NP (ng/mL) | 1.000 (0.979–1.021) | 0.969 | | |
| SMI (kg/m ²) | 0.277 (0.137–0.560) | <0.001 | | |
| Handgrip strength (kg) | 0.740 (0.643–0.852) | <0.001 | | |
| Lumbar spine BMD (g/cm ²) | 0.000 (0.000–0.004) | <0.001 | | |
| Femoral neck BMD (g/cm ²) | 0.000 (0.000–0.000) | <0.001 | | |
| Total hip BMD (g/cm ²) | 0.000 (0.000–0.000) | <0.001 | | |
| Sarcopenia | 9.077 (3.209–25.672) | <0.001 | 6.510 (2.100–20.180) | 0.001 |
| Vertebral fracture | 5.351 (1.719–16.657) | 0.004 | | |

ALP, alkaline phosphatase; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BCAA, branched-chain amino acids; BMD, bone mineral density; BMI, body mass index; CI, confidence interval; GGT, gamma-glutamyltransferase; IGF-1, insulin-like growth factor 1; M2BPGi, Mac-2 binding protein glycosylation isomer; OR, odds ratio; P1NP, procollagen type I N-terminal propeptide; skeletal muscle mass index; SMI, skeletal muscle mass index; TRACP-5b, tartrate resistant acid phosphatase-5b.

Table S6 Factors associated with sarcopenia in female patients with primary biliary cholangitis

| Variable | Univariate | | Multivariate | |
|---------------------------------------|----------------------|---------|----------------------|---------|
| | OR (95%CI) | P-value | OR (95%CI) | P-value |
| Age (years) | 1.055 (1.007–1.106) | 0.025 | | |
| BMI (kg/m ²) | 0.682 (0.555–0.839) | <0.001 | 0.706 (0.562–0.888) | 0.003 |
| Liver cirrhosis | 4.600 (0.950–22.278) | 0.058 | | |
| Age at diagnosis (years) | 1.049 (1.004–1.097) | 0.032 | | |
| Duration of disease (years) | 1.005 (0.937–1.077) | 0.899 | | |
| Menopause | 1.984 (0.407–9.664) | 0.397 | | |
| Duration of menopause (years) | 1.072 (1.021–1.126) | 0.005 | | |
| AST (IU/L) | 1.003 (0.963–1.045) | 0.887 | | |
| ALT (IU/L) | 0.960 (0.904–1.020) | 0.183 | | |
| ALP (IU/L) | 1.001 (0.997–1.004) | 0.771 | | |
| GGT (IU/L) | 0.998 (0.990–1.007) | 0.713 | | |
| Total bilirubin (mg/dL) | 1.464 (0.711–3.014) | 0.301 | | |
| Albumin (g/dL) | 0.289 (0.089–0.941) | 0.039 | | |
| M2BPGi (C.O.I) | 1.245 (0.909–1.705) | 0.171 | | |
| IGF-1 (ng/mL) | 0.987 (0.973–1.001) | 0.074 | | |
| BCAA (μmol/L) | 0.999 (0.995–1.004) | 0.745 | | |
| TRACP-5b (mU/dL) | 1.001 (0.998–1.003) | 0.614 | | |
| Total P1NP (ng/mL) | 0.990 (0.966–1.014) | 0.411 | | |
| SMI (kg/m ²) | 0.007 (0.001–0.059) | <0.001 | | |
| Handgrip strength (kg) | 0.527 (0.391–0.711) | <0.001 | | |
| Lumbar spine BMD (g/cm ²) | 0.009 (0.001–0.147) | 0.001 | | |
| Femoral neck BMD (g/cm ²) | 0.002 (0.000–0.158) | 0.006 | | |
| Total hip BMD (g/cm ²) | 0.001 (0.000–0.084) | 0.002 | | |
| Osteoporosis | 9.077 (3.209–25.672) | <0.001 | 4.012 (1.186–13.576) | 0.026 |
| Vertebral fracture | 7.857 (2.451–25.187) | 0.001 | 8.898 (1.828–43.305) | 0.007 |

ALP, alkaline phosphatase; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BCAA, branched-chain amino acids; BMD, bone mineral density; BMI, body mass index; CI, confidence interval; GGT, gamma-glutamyltransferase; IGF-1, insulin-like growth factor 1; M2BPGi, Mac-2 binding protein glycosylation isomer; OR, odds ratio; P1NP, procollagen type I N-terminal propeptide; skeletal muscle mass index; SMI, skeletal muscle mass index; TRACP-5b, tartrate resistant acid phosphatase-5b.

Table S7 Characteristics of patients with and without sarcopenia/osteoporosis

| Variable | Osteoporosis (-) | Osteoporosis (+) | Osteoporosis (-) | Osteoporosis(+) | P-value |
|---------------------------------------|------------------|------------------|------------------|------------------|---------|
| | Sarcopenia (-) | Sarcopenia(-) | Sarcopenia (+) | Sarcopenia (+) | |
| Patients, n (%) | 75 (64.1) | 15 (12.8) | 9 (7.7) | 18 (15.4) | |
| Female, n (%) | 59 (78.7) | 13 (86.7) | 8 (88.9) | 16 (88.9) | 0.646 |
| Age (years) | 63.0 (53.0–70.0) | 73.0 (68.0–77.0) | 73.0 (56.0–76.0) | 73.5 (65.8–81.5) | <0.001 |
| BMI (kg/m ²) | 22.9 (21.2–26.0) | 22.6 (20.2–24.2) | 21.2 (18.9–24.2) | 19.3 (18.1–21.4) | <0.001 |
| Liver cirrhosis, n (%) | 3 (4.0) | 2 (13.3) | 2 (22.2) | 4 (22.2) | 0.045 |
| Age at diagnosis (years) | 57.0 (48.0–66.0) | 66.0 (57.0–71.0) | 72.0 (53.0–74.0) | 66.5 (52.5–74.3) | 0.003 |
| Duration of disease (years) | 2.0 (1.0–6.0) | 5.0 (2.0–15.0) | 2.0 (1.0–3.5) | 4.0 (1.0–10.5) | 0.223 |
| AST (IU/L) | 24 (20–33) | 27 (23–30) | 24 (21–31) | 26 (23–33) | 0.964 |
| ALT (IU/L) | 20 (15–27) | 18 (14–22) | 18 (13–26) | 18 (14–22) | 0.478 |
| ALP (IU/L) | 290 (229–363) | 271 (200–314) | 300 (240–379) | 272 (215–327) | 0.645 |
| GGT (IU/L) | 43 (29–74) | 28 (24–52) | 41 (18–66) | 33 (24–71) | 0.391 |
| Total bilirubin (mg/dL) | 0.6 (0.5–0.8) | 0.6 (0.4–0.8) | 0.6 (0.5–1.0) | 0.5 (0.4–0.6) | 0.150 |
| Albumin (g/dL) | 4.2 (3.9–4.3) | 4.0 (3.9–4.3) | 4.0 (3.4–4.5) | 3.9 (3.7–4.1) | 0.037 |
| M2BPGi (C.O.I) | 0.77 (0.57–1.12) | 0.96 (0.52–1.34) | 0.87 (0.67–3.59) | 1.47 (0.99–1.71) | 0.009 |
| IGF-1 (ng/mL) | 95 (73–117) | 61 (51–101) | 88 (57–114) | 61 (45–96) | 0.010 |
| BCAA (μmol/L) | 442 (396–500) | 380 (325–436) | 407 (321–486) | 366 (310–443) | 0.039 |
| TRACP-5b (mU/dL) | 328 (237–429) | 384 (309–444) | 440 (210–500) | 390 (227–484) | 0.499 |
| P1NP (ng/mL) | 44 (35–58) | 48 (35–68) | 52 (30–77) | 40 (33–63) | 0.837 |
| SMI (kg/m ²) | 6.48 (6.03–7.12) | 5.90 (5.75–6.35) | 5.27 (4.91–5.68) | 5.00 (4.43–5.24) | <0.001 |
| Handgrip strength (kg) | 23.9 (21.9–28.1) | 21.9 (16.8–22.5) | 17.0 (14.8–17.3) | 16.6 (12.8–17.5) | <0.001 |
| Lumbar spine BMD (g/cm ²) | 1.11 (1.01–1.23) | 0.81 (0.70–0.87) | 0.96 (0.85–1.05) | 0.84 (0.74–0.94) | <0.001 |
| Femoral neck BMD (g/cm ²) | 0.82 (0.74–0.90) | 0.60 (0.57–0.67) | 0.75 (0.70–0.83) | 0.65 (0.58–0.71) | <0.001 |
| Total hip BMD (g/cm ²) | 0.85 (0.79–0.93) | 0.69 (0.58–0.71) | 0.79 (0.77–0.88) | 0.67 (0.62–0.72) | <0.001 |
| Vertebral fracture, n (%) | 5 (6.7) | 3 (20.0) | 3 (33.3) | 10 (55.6) | <0.001 |

Values are shown as median (interquartile range) or number (percentage). Statistical analysis was performed using the chi-squared test or the Kruskal-Wallis test, as appropriate. ALP, alkaline phosphatase; ALT, alanine aminotransferase; AST, aspartate aminotransferase; BCAA, branched-chain amino acids; BMD, bone mineral density; BMI, body mass index; GGT, gamma-glutamyltransferase; IGF-1, insulin-like growth factor 1; M2BPGi, Mac-2 binding protein glycosylation isomer; P1NP, procollagen type I N-terminal propeptide; SMI, skeletal muscle mass index; TRACP-5b, tartrate-resistant acid phosphatase 5b.