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| **Supplementary table 1**. Summary of altered bile acid profile in MASLD and CKD patients and animal models |
| **Author** | **Groups** | **Sample** | **Diagnosis** | **Findings** |
| **MASLD** |
| Nimer, N., et al.27 (2021) | MASLD (n=102) vs. HC (n=50) | Serum | Liver biopsy | Increased DCA, TCA, GCDCA, TCDCA, GHCA, GDCA, TDCA, GUDCA, HDCA, 3-keto-DCA, Iso-DCADecreased 7-keto-DCA, LCA |
| Chen, F., et al.25 (2020) | MASLD (n=538) vs. HC (n=30) | Serum | Liver biopsy | Increased total BAs, PBAs, SBAs |
| Jiao, N., et al.5 (2018) | MASH (n=16) vs. HC (n=11) | Serum | Liver biopsy | Increased total BAs, SBAs, SBAs/PBAsIncreased CA, CDCA, DCA, UDCA |
| Puri, P., et al.21 (2018) | MASH (n=37) vs. MAFL (n=25) vs. HC (n=24) | Serum | Liver biopsy | Increased PBAs, con PBAs, con CA, con CDCA, con UDCA, Decreased total SBAs, total SBAs/PBAsIncreased GCA, TCA, GCDCA, TCDCA, DCA |
| Tan, X., et al.40 (2019) | MASLD (n=34) vs. HC (n=14) | Serum  | Liver biopsy | Increased TCA Decreased TCDCA, GLCA  |
| Lake, A., et al.39 (2013) | MASH (n=16) vs. HC (n=19) | Serum | Liver biopsy | Increased TCA, TDCA, GCDCA Decreased CA, GDCA. |
| Caussy, C., et al.26 (2019) | MASLD (n=20) vs. HC (n=136) | Serum | Liver biopsy | Increased con PBAsDecreased uncon BAs, PBAs and GHCA  |
| Sydor, S., et al.41 (2020) | HC (n=20) vs. MASH-non-HCC (n=34) vs. MASH-HCC (n=33) | Serum | Ultrasound or liver biopsy | Increased total BAs, con BAs, con PBAs Increased GCA, GCDCA, CDCA, TCA, TLCA, UDCA, TUDCA, GUDCA |
| Smirnova, E., et al.22 (2022) | MASH (n=34) vs. MAFL (n=23) vs. HC (n=18) | Fecal | Liver biopsy | Increased SBAs, 7,12-diketo-LCA, GDCA, LCA, TLCA |
| Mouzaki, M., et al.20 (2016) | MASH (n=15) vs. MAFL (n=12) vs. HC (n=25) | Fecal | Liver biopsy | Increased fecal BAs, PBAs/SBAs,Increased CA, CDCA |
| Li, C., et al.34 (2021) | MASH (n=8) vs. HC (n=8) | Fecal  | Fed with MCD diet | Increased PBAs, especially CDCA, CA, GCA, GHCA, and NorCADecreased SBAs, especially TDCA, THDCA, GHDCA, and TωMCA |
| He, B., et al.36 (2021) | MASH (n=6) vs. HC (n=6) | Serum | Liver biopsy | Increased TDCA, DCA, TCA, CADecreased SBAs, MCA, TUDCA |
| Li, H., et al.89 (2020) | MASH (n=8) vs. HC (n=8) | Colon | Liver biopsy | Increased GCA, TCA, TCDCA, CA, TβMCA, TαMCA, GDCADecreased βCDCA, LCA, iso-LCA, 12-keto-LCA |
| **CKD** |
| Jimenez, F., et al.15 (2002) | CRF (n=23) vs. HC (n=31) | Serum | abnormalities of kidney function > 3 months | Increased total BAs, DCA Decreased CA |
| Li, X., et al.32 (2022) | HC (n=10) vs. Hypertension (n=30) vs. Hypertensive nephropathy (n=11) | Serum | 30 ≤ eGFR ≤ 60 ml/min/1.73m2 OR ACR ≥ 30 mg/g | Increased TCADecreased CDCA |
| Wei, H., et al.38 (2021) | DM mice (n=12) vs. HC (n=10) | Serum | db/db mice  | Increased total BAs, TCA, TβMCA |
| Chu, L., et al.31 (2015) | CRF (n=61) vs. HC (n=34) | Serum | 15 ≤ eGFR ≤ 59 mL/min/1.73 m2 | Increased serum BAs Decreased 24h urinary BAs |
| Li, R., et al.33 (2019) | ESRD (n=77) vs. HC (n=30) | Serum | eGFR < 15 mL/min/1.73 m2 | Increased βMCA, GCDCA, TCDCA, TCA, GCA, TαMCA, THCA, TUDCADecreased CA, CDCA, DCA, HDCA, UDCA, α + ωMCA, γMCA 7-keto-LCA, 12-keto-LCA, 6,7-diketo-LCA  |
| Zhao, J., et al.37 (2019) | DN mice (n=7) vs. HC (n=7) | Fecal | Injected with STZ | Increased total BAs, CA/TCADeceased DCA/CA |

*Abbreviations:* MASLD, metabolic dysfunction-associated steatotic fatty liver disease; MASH, metabolic dysfunction-associated steatohepatitis; MAFL, metabolic dysfunction-associated fatty liver; HCC, hepatocellular carcinoma; ESRD, end stage renal disease; HC, healthy control; CRF, chronic renal failure; DN, diabetic nephropathy; DM, diabetes mellitus; MCD, methionine-choline deficiency; STZ, streptozocin; PBAs, primary bile acids; SBAs, secondary bile acids; con BAs, conjugated bile acids; uncon BAs, unconjugated BAs; CA, cholic acid; GCA, glycocholic acid; TCA, taurocholic acid; CDCA, chenodeoxycholic acid; GCDCA, glycochenodeoxycholic acid; TCDCA, taurochenodeoxycholic acid; GUDCA, glycoursodeoxycholic acid; TUDCA, tauroursodeoxycholic acid; DCA, deoxycholic acid; GDCA, glycodeoxycholic acid; TDCA, taurodeoxycholic acid; HDCA, hyodeoxycholic acid; THDCA, taurohyodeoxycholic acid; GHDCA, glycohyodeoxycholic acid; GHCA, hyocholic acid; TUCA, tauroursocholic acid; GLCA, glycolithocholic acid; TLCA, taurolithocholic acid; NorCA, nor-cholic acid; NorDCA, nor-deoxycholic acid; MCA, muricholic acid; TωMCA, tauro ω-muricholic acid; TβMCA, tauro β-muricholic acid; TαMCA, tauro α-muricholic acid;