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Bone metabolism dynamics in the early post-transplant period following kidney and liver transplantation

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Bone disease contributes to relevant morbidity after solid organ transplantation. Vitamin D has a crucial role for bone metabolism. Activation of vitamin D depends on the endocrine function of both, liver and kidney. Our study assessed key markers of bone metabolism at time of transplantation and 6 months after transplantation among 70 kidney and 70 liver recipients. In 70 kidney recipients 25-OH vitamin D levels did not differ significantly between peri-transplant (median 32.5nmol/l) and 6 months post-transplant (median 41.9nmol/l; P = 0.272). Six months post-transplant median 1, 25-(OH)2 vitamin D levels increased by >300% (from 9.1 to 36.5ng/l; P<0.001) and median intact parathyroid hormone levels decreased by 68.4% (from 208.7 to 66.0 ng/l; P<0.001). Median β-Crosslaps (CTx) and total procollagen type 1 amino-terminal propeptide (P1NP) decreased by 65.1% (from 1.32 to 0.46ng/ml; P<0.001) and 60.6% (from 158.2 to 62.3ng/ml; P<0.001), respectively. Kidney recipients with incident fractures had significantly lower levels of 1, 25-(OH)2 vitamin D at time of transplantation and of intact parathyroid hormone 6 months post-transplant. Among 70 liver recipients, 25-OH vitamin D, 1, 25-(OH)2 vitamin D and intact parathyroid hormone levels were not significantly altered between peri-transplant and 6 months post-transplant. Contrary to kidney recipients, median CTx increased by 60.0% (from 0.45 to 0.72 ng/ml; P = 0.002) and P1NP by 49.3% (from 84.0 to 125.4ng/ml; P = 0.001) in the longitudinal course. Assessed biomarkers didn't differ between liver recipients with and without fractures. To conclude, the assessed panel of biomarkers proved highly dynamic after liver as well as kidney transplantation in the early post-transplant period. After kidney transplantation a significant gain in 1, 25-(OH)2 vitamin D combined with a decline in iPTH, CTx and P1NP, whereas after liver transplantation an increase in CTx and P1NP were characteristic.

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