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The impact of early tacrolimus exposure to long-term renal function and growth in pediatric liver transplant recipients

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Introduction: Life-long immunosuppression is required for liver transplant (LT) recipients to prevent graft rejection. This study aimed to analyze the effect of early calcineurin inhibitor exposure to the long-term outcomes of pediatric recipients.

Methods: This was a retrospective study from a university center. Pediatric patients (age <11 year-old at time of LT) and had regular follow-up, from 2001 to 2018 were included. All tacrolimus (TAC) trough level within the 1st year after LT were plotted against time and the area under curve was defined as total TAC exposure. Patients were divided into high and low TAC exposure according to the median TAC exposure.

Results: Eighty-five patients were included (high TAC n=42, low TAC n=43). (Figure 1a and 1b) The TAC exposure of the 2 groups became similar from 3rd to 5th year after LT. The eGFR at 5-, 10- and 15-year after LT were 107.6 vs. 116.0, 111.9 vs. 117.8 and 98.7 vs. 118.3 in the high and low TAC group respectively (Figure 2a) although there was no difference in serum creatinine level (Figure 2b). Long-term complication rates for ACR, OI and PTLD were similar in both groups (11.9% vs. 7.0% and 2.4% vs. 2.3% and 26.2% vs. 18.6%). Growth of LT recipients was comparable to the general population and there was no difference between the two groups for body weight, height and body mass index. (Figure 3) There was no difference in the incidence of other metabolic complications including hypertension, dyslipidemia and diabetes and the risk remains very low in the long run (0-2.4%).

Conclusion: Early TAC exposure is detrimental to the long-term renal function of pediatric recipients while the risk of ACR, opportunistic infection and graft survival were similar. TAC exposure should be reduced early after LT as long as graft function allows, in order to preserve long-term renal function.