Impact of psychosocial factors on medication level variability index and outcomes in pediatric liver transplant recipients

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BACKGROUND

Caregivers are largely responsible for activities essential to maintaining a functioning graft such as administration of immunosuppressive medications and adherence to medical regimens after pediatric liver transplantation. Therefore, the psychosocial factors of both patients and caregivers have a critical role in transplant outcomes. Appropriate assessment and recognition of these psychosocial determinants pre-transplantation may allow transplant teams to better define the needs of organ recipients and develop specific countermeasures, which may then contribute towards improving the short and long-term outcomes related to transplant.

PURPOSE

Identification of psychosocial factors that impact adherence and short term outcomes after transplantation.

METHODS

- Retrospective analysis of medical records of all children (less than 18 years old) who underwent primary LT at our center between January 1, 2012 and December 31, 2015
- Comprehensive psychosocial assessment was conducted as part of the pre-LT evaluation by a licensed social worker
- Social workers gathered information from the family using an objective questionnaire that is uniformly utilized across all solid organ transplant programs at our institution
- MLVI calculated as standard deviation of quarterly outpatient tacrolimus trough level measurements. It was analyzed separately for each post-transplant year, up to a maximum of four years.
- Episodes of ACR in year 1 post-transplantation were documented in pathology reports in the patient's electronic medical record. ACR was defined as mild, moderate, or severe based on liver biopsies that were obtained at the discretion of the primary hepatologist.

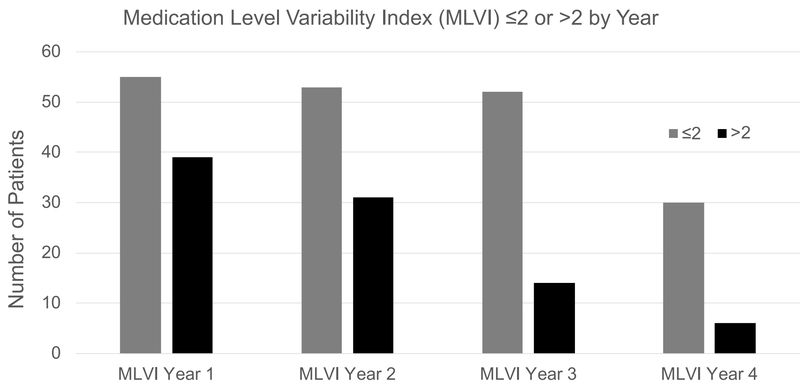

Fig 1: Medication Level Variability Index (MLVI) for all patients by year

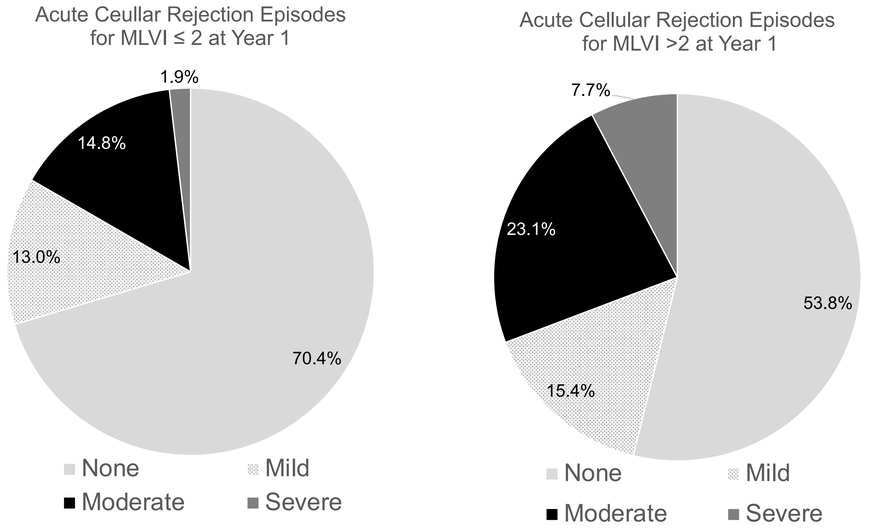

Fig 2: Acute cellular rejection (ACR) episodes for MLVI >2 and MLVI ≤2 at Year 1

RESULTS

- A total of 136 patients were evaluated
- MLVI was greater than 2 in 39 (41.5%) patients. The mean (SD) MLVI for all patients was 2.2 (1.7) in post-transplant year 1 and it declined modestly in each successive year, reaching 1.5 (1.5) in year 4
- Parental characteristics associated with MLVI >2 included lower maternal and paternal age at transplant (p=0.048 and 0.015 respectively), as well as lower educational level (p=0.016 and 0.047 respectively). Financial characteristics associated with MLVI >2 included lower household income (p=0.001) and public (ie. Medicaid) insurance (p=0.007).
- 13 patients (23.6%) with MLVI ≤2 had 16 episodes of ACR, and 10 patients (25.6%) with MLVI >2 had 18 episodes of ACR
- Number of acute cellular rejection episodes trended higher in nonadherent patients (p=0.053), and these patients had a higher number of moderate to severe rejection episodes

CONCLUSIONS

We observed several patient and parent related psychosocial factors that can contribute towards suboptimal adherence to medications and poor clinical outcomes after transplantation. Our data on ACR episodes in relation to MLVI at year 1 post-transplantation demonstrated a higher number of patients with MLVI >2 who had moderate to severe rejection, as compared to patients with MLVI ≤2 where mild to moderate rejection was predominant. Therefore in order to minimize disparities and optimize equitable outcomes we will likely need to allocate additional resources for imparting knowledge to the caregiver upfront, and also anticipate financial resources that might alleviate the LT related financial burden on the caregivers. Assessment of these psychosocial factors in a standardized manner is essential to the success of our pediatric liver transplant recipients.

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