Saudi J Kidney Dis Transpl 2014;25(6):1290-1292

Saudi Journal of Kidney Diseases and Transplantation

Letter to the Editor

Burkitt's Lymphoma Developing Post Liver Transplantation: Posttransplant Lymphoproliferative Disorders International Survey

To the Editor,

Posttransplant lymphoproliferative disorders (PTLD) in liver transplant recipients are reportedly about one to two.[1] Burkitt's lymphoma in non-transplant patients has been reportedly associated with a poor prognosis, and its diagnosis usually necessitates chemotherapy of increasing intensity according to the disease stage. The typical presentation involves rapidly growing and multifocal extra-nodal masses throughout the body.[2-4] We gathered data of all individual cases of Burkitt's lymphoma reported by the published series in English literature, in order to standardize the data and find associations of Burkitt's lymphoma developing in liver transplant patients.

The study population consisted of 125 liver allograft recipients, who had developed PTLD in their post transplantation period. Histopathological evaluation confirmed PTLD of Burkitt's lymphoma type in 32 (25.6%) of the study participants, and the remaining 93 (74. 4%) had other types of PTLD. The data were gathered from 18 studies [5-11] and references 11, 16, 20, 25, 28, 45, 46, 50 from[12] and 43, 50, 51 from [13] have been included into a database and analyzed.

There were 50 (55.6%) males and 40 (44.4%) female patients (35 unreported). The mean age at diagnosis of PTLD was 21.9 ± 21.9 years (no unreported data; 125 cases). The mean interval between transplantation and the diagnosis of PTLD was 46.7 ± 51.5 months (for 89 patients), whereas, the follow-up time after diagnosis of PTLD was 42.8 ± 46.8 months (for 101 patients). The characteristics of the patients regarding their malignancy sites are summarized in Table 1. Burkitt's lymphoma was equally prevalent among males and females ($P = 0.82$) and different age groups ($P = 0.68$). The Epstein–Barr virus (EBV) infection rates were also comparable between the two groups ($P = 0.252$). Burkitt's lymphoma lesions were significantly more likely to manifest in the bone marrow (nine (33%) vs. seven (9%); $P = 0.006$); a weak predominated rate of CNS involvement was also seen, although the significance level was not achieved (three (11%) vs. two (2%); $P = 0.09$). Even as all lesions from Burkitt's PTLD were positive for BCL-6, this rate was 50% among the controls ($P = 0.033$).

At the last follow-up, 58 (49.2%) patients were dead (seven were with unreported data). The survival analysis showed no significant difference in the outcome of PTLD liver recipients with and without Burkitt's disease ($P = 0.341$; Figure 1). Changing the outcome parameter to "death due to PTLD" did not change the result.

In this study, we found that Burkitt's lymphoma developing in liver transplant recipients is more likely to present as late onset PTLD, with a higher rate of disseminated disease as well as a monomorphic histopathology.[13] Nevertheless; we have not found a survival disparity between Burkitt's lymphoma and other PTLD types. However, post liver transplantation Burkitt's lymphoma significantly developed bone

Table 1. Characteristics of liver graft recipients based on their PTLD pathology.

Variables	Burkitt's PTLD	Control patients	Sig.	Available data
Age (years)	23.1 ± 19.8	21.5 ± 22.6	0.712	125
Pediatric (%)	17 (53.1)	55 (59.1)	0.769	125
Gender male (%)	16 (59.3)	34 (54)	0.817	90
Time to PTLD development (month)	58.2 ± 44.3	42.5 ± 53.6	0.205	89
Early onset (%)	4 (16.7)	26 (40)	0.046	89
Multiorgan involvement (%)*	12 (54.5)	35 (51.5)	0.499	90
Disseminated PTLD (%) *	7 (33.3)	16(26.7)	0.582	81
Remission episode (%)	23 (92%)	64 (83.1)	0.348	102
CD10 positive lesions (%)	6 (100)	1 (33)	0.083	9
CD20 positive lesions (%)	11 (84.6)	16 (80)	0.556	33
EBER positive lesions (%)	12 (60)	30 (71.4)	0.396	62
Bcl-6 positive lesions (%)	9 (100)	5 (50)	0.033	19
LMP-1 positive lesions (%)	1 (25)	7 (77.8)	0.07	13

marrow metastases more frequently.[14]

Our study was associated with some limitations. First, the study subjects were gathered from different reports that might have had different approaches. On the other hand, our study represented the largest ever investigated population of Burkitt's lymphoma in liver graft recipients; it also found novel and helpful findings for the physicians to evaluate their patients for early diagnosis of metastasis, and treatment.

In conclusion, this study showed that the liver allograft recipients developing Burkitt's lymphoma after transplantation are at a higher risk of bone marrow complication; thus we recommend that all newly diagnosed patients go for proper evaluations. Future prospective studies are required to confirm our findings.

Acknowledgment

This study was supported by a grant from the Baqiyatallah University of Medical Sciences. No duplicated paper from data of this study has

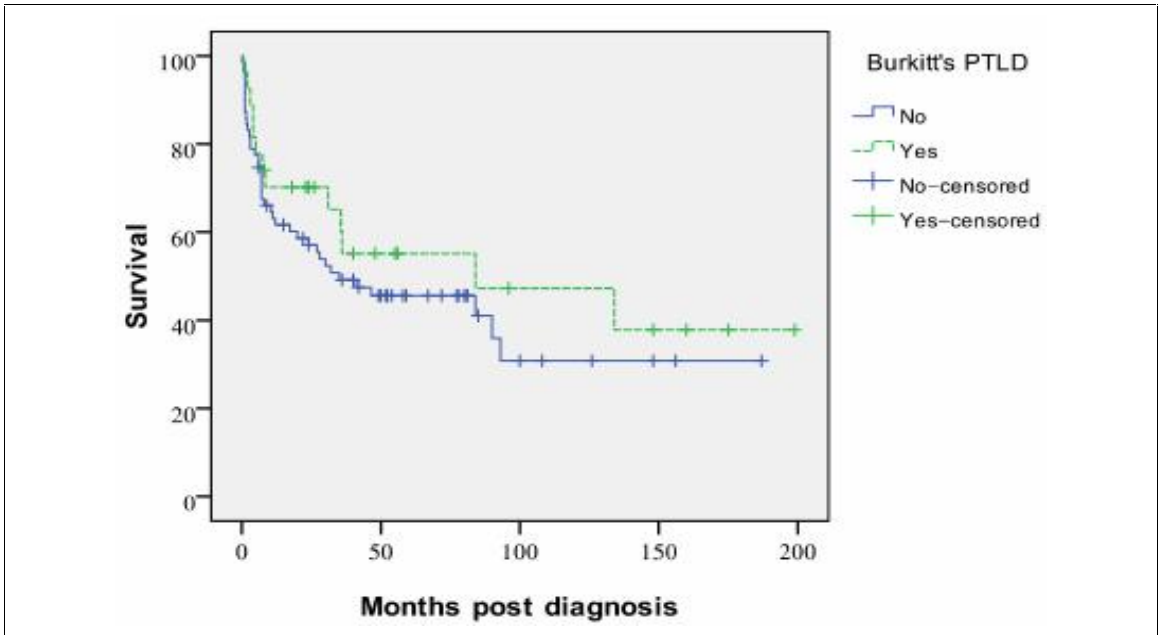

Figure 1. Survival curves of liver graft recipients developing PTLD with regard to their histological features

been published before, or is under consideration anywhere. No conflict of interest exists in this study.

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