Healthcare Costs Associated with Liver Transplantation in Young Patients: A Population-Based Retrospective Cohort Study in Korea

Haeseon Lee[1,2], and Hae Sun Suh[1,2,3,*]

1 Department of Regulatory Science, Graduate School, Kyung Hee University, Seoul, Republic of Korea
2 Institute of Regulatory Innovation through Science (IRIS), Kyung Hee University, Seoul, Republic of Korea
3 College of Pharmacy, Kyung Hee University, Seoul, Republic of Korea

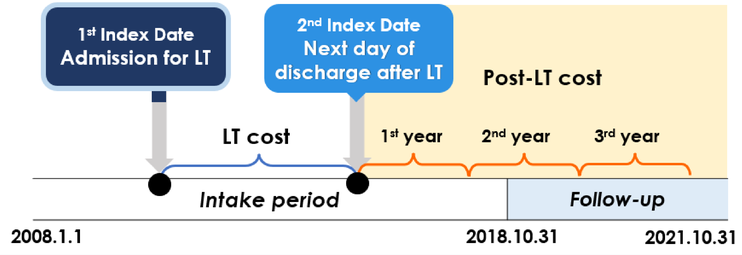
INTRODUCTION

- Liver transplantation (LT) is an effective treatment, but it is costly and requires lifelong management.
- Indications for liver transplantation are distinctly different between young patients and adults, with biliary atresia being the most common in Korea.
- This study aimed to examine the medical expenses for LT and following burden in young recipients in South Korea.

METHODS

- **Data source**
  - Health Insurance Review and Assessment Service (HIRA) claims database covering the entire population in South Korea from Jan 2008 to Oct 2021
- **Study population**
  - We included young patients less than 20 years of age who received LT (procedure code of Q80*) between Jan 2008 and Oct 2018.
  - To estimate post-LT costs, we only selected patients with at least three years of follow-up after discharge.
- **Outcomes**
  - LT cost was calculated as the medical expenses (including Inpatient, outpatient, and medicine costs) incurred from the time patients were hospitalized for surgery until discharge.
  - Post-LT cost was analyzed in the claims data with ICD-10 code Z94.4 (liver transplant status) and we estimated annual medical expenses incurred from the day after discharge to the following year (1st, 2nd, and 3rd year).
- **Statistical analysis**
  - Baseline patient characteristics and costs were summarized descriptively. We measured Mean, standard deviation, and interquartile range for continuous variables and summed counts and percentage for categorical variables.

STUDY DESIGN



RESULTS

Table 1. Baseline characteristics

	N	%
No of patients	649	100.0
Female	374	57.6
Age, years	5.2 ± 5.9 [a]	
1-4	414	63.8
5-9	80	12.3
10-14	70	10.8
15-19	85	13.1
Liver transplantation type [b]		
LDLT	411	63.3
CDLT	236	36.4

LDLT, living donor liver transplantation; CDLT, cadaveric donor liver transplantation
[a] The average age is expressed as mean ± standard deviation
[b] Two missing values were identified in the LT type.

Table 2. Healthcare cost for LT and post-LT for three years (USD)

	Mean (SD)	Median	Q1 - Q3
Liver transplantation			
Total cost	54,088 (36,148)	46,702	34,159 - 59,245
Post-liver transplantation			
First year cost	12,616 (18,070)	9,438	4,571 - 14,304
Second year cost	6,580 (13,717)	4,011	1,789 - 6,233
Third year cost	4,613 (8,882)	2,928	1,045 - 4,810

SD, Standard deviation; Q1, first quartile; Q3, third quartile.
Note: converted to current prices

DISCUSSION

- Liver transplantation was most frequent in children younger than 5 years of age among young recipients.
- The costs incurred in the first year are significant, including the liver transplant surgery itself.
- Post-LT costs were characterized by a wide range and a skew to the right. Understanding the factors that contribute to high expenses can help to develop strategies to reduce future healthcare costs.
- A limitation of this study was that post-LT costs may have been underestimated due to the possibility of claims missing Z94.4 coding even though they were liver transplant follow-ups.

CONCLUSION

- This study presents the post-LT costs that have not previously been reported in young patients.
- Even three years after transplantation, there were still high medical expenses.
- It is necessary to reduce follow-up healthcare costs by finding ways to maximize the benefits of liver transplantation.

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Author contact: universe91@khu.ac.kr