Impact of Education by Liver Pharmacists on Medication Knowledge and Adherence in Patients with Liver Cirrhosis

Candra SR[1], Yee ML[1], Wong JJ[1], Lim JMJ[1], Fok JHC[1], Chooi MKC[1], Kwa XYJ[1], Tey XW[1], Tan JHF[1], Chang PEJ[2,3]
[1]Division of Pharmacy, Singapore General Hospital, Singapore
[2]Department of Gastroenterology and Hepatology, Singapore General Hospital, Singapore
[3]Duke-NUS Medical School, Singapore

Background

Liver cirrhosis is a major contributor to morbidity and mortality. Common complications such as variceal bleeding, ascites, and hepatic encephalopathy are typically managed with pharmacotherapy. However, several studies have reported suboptimal medication adherence among patients with liver cirrhosis.

This study aims to:

- ❑ Describe patients' knowledge and adherence to medications prescribed for complications of cirrhosis.
- ❑ Evaluate the effectiveness of education by liver pharmacists in improving medication adherence.

Methods

From January to December 2024, patients admitted to Singapore General Hospital (SGH) under the care of the liver team were screened. Patients with liver cirrhosis and were prescribed at least one of the following medications: non-selective beta-blockers (NSBB), diuretics, or lactulose.

Baseline survey
- ❑ Structured surveys were conducted by liver pharmacists to assess patients' knowledge of drug indication, knowledge of their dosing regimen, and adherence.
- ❑ The 3 questions were repeated for each class of medication: NSBB, diuretics, and lactulose.
- ❑ An overall composite score (range 0-100%) was calculated for each patient based on the number of correct response

Counsel-ling
- ❑ Counselling was done by trained liver pharmacists using a standardized coloured-image medication leaflet.
- ❑ Patient was empowered to adjust the dose of lactulose to maintain bowel output of 2-3 times per day.

Follow-Up survey
- ❑ The same structured survey was administered after counselling at least 2 weeks after discharge or during subsequent admission.
- ❑ The overall scores before and after counselling were compared.

Results

A total of 141 patients were surveyed and received counselling from liver pharmacists. Most patients have decompensated cirrhosis (Child-Pugh class B and C) and NSBB was the most commonly prescribed medication class.

		n = 141
Age		69.0 ± 9.3 years
Male		83 (58.9%)
Length of stay		9.4 ± 9.9 days
Child-Pugh class	A	20 (14.1%)
	B	97 (68.8%)
	C	24 (17.0%)
Medications	NSBB	113 (80.1%)
	Diuretics	89 (63.1%)
	Lactulose	57 (40.4%)
	Rifaximin	22 (15.6%)

Table 1: Baseline characteristics of the patients

Results

At baseline, patients demonstrated poor knowledge of medication indications, particularly for NSBB (19.5%) and lactulose (57.9%). Among all medications, lactulose had the lowest adherence rate.

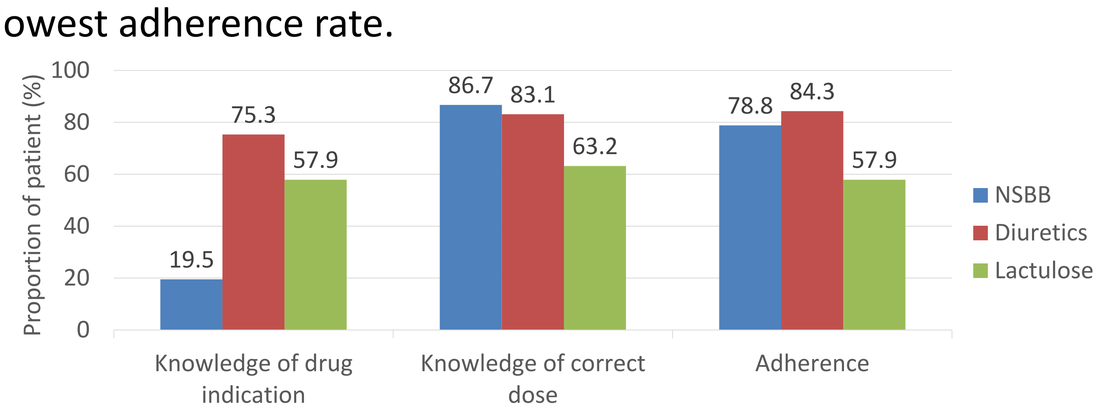

Figure 1: Baseline knowledge and adherence based on medications

Patients with compensated cirrhosis (Child-Pugh A) demonstrated the lowest knowledge of medication indications (10%) and adherence (50%) compared to those with decompensated cirrhosis (Child-Pugh B and C).

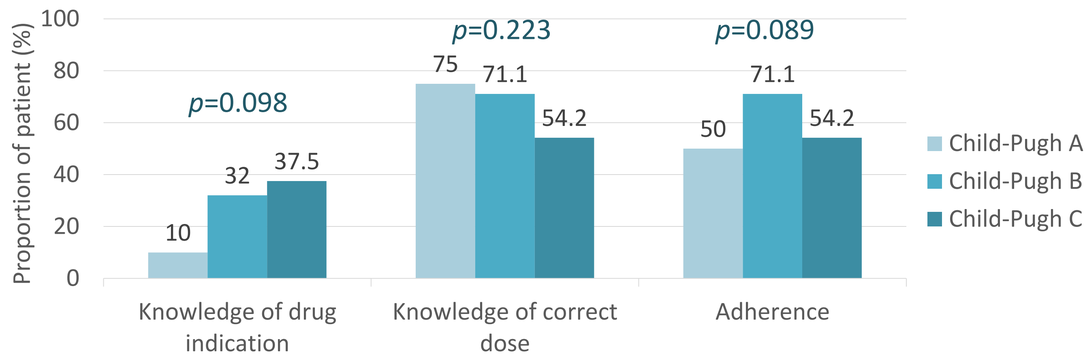

Figure 2: Baseline knowledge and adherence based on Child-Pugh class

Follow-up survey data were available for 58 (41%) patients. The median composite score (knowledge of drug indication, dosing and adherence) improved from 72.5% to 88.9% ($p<0.001$) after pharmacist counselling. Specific improvement was seen in knowledge of NSBB indication (15% to 41%, $p=0.004$) and adherence to lactulose (54% to 87%, $p=0.031$)

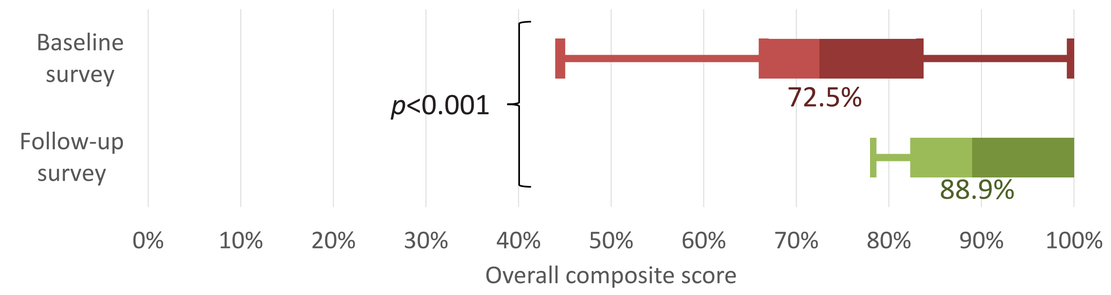

Figure 3: Improvement in overall composite score after counselling

Conclusion

- ❑ There is suboptimal patient knowledge and adherence to liver-related medications, particularly among patients with early-stage cirrhosis on non-selective beta blockers.
- ❑ Education and empowerment provided by liver pharmacists significantly improve medication knowledge and adherence.
- ❑ Targeted pharmacist-led education is recommended to improve medication knowledge and adherence. This may help reduce the risk of disease progression and hospitalization.