First Do No Harm: Medication-Related Problems Among Patients With Cirrhosis

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Cirrhosis is a chronic condition with high morbidity and mortality. It is the fifth leading cause of adult deaths and ranks eighth in economic cost among the major illnesses.[1] Patients with decompensated cirrhosis are often prescribed multiple medications for their disease, often by different providers working in different health systems.[2] Studies have shown that patients with cirrhosis lack adequate knowledge about the information they need to manage their disease, including information regarding their medications, and that medication-related problems (MRPs) are associated with high rates of hospital readmissions.[3-5] In other disease states, integrative models of pharmacist education and medication management in outpatient practices have been shown to improve patient knowledge, adherence, and outcomes. Until now, no such intervention studies have been performed in patients with cirrhosis.[6]

Abbreviation: MRP, medication-related problem.

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ADDRESS CORRESPONDENCE AND REPRINT REQUESTS TO:

Lydia Aye, D.O.
Division of Gastroenterology and Transplantation Institute
Loma Linda University Health
25455 Barton Road #102B
Loma Linda, CA 92354
E-mail: llaye@llu.edu
Tel.: +1-909-558-2808

In this issue of *Hepatology Communications*, Hayward and colleagues[7] discuss the results of their randomized controlled trial of pharmacist-led, patient-oriented, medication education intervention and its association between MRPs and patient outcomes. They documented at least two or more MRPs for all patients, with a median of 6 MRPs per patient. Some patients had as many as 17, and more than half of patients had at least one "high-risk" MRP! Patients in the intervention arm had a significantly lower adjusted incidence rate of unplanned admissions compared to usual care patients. The number of high-risk MRPs was associated with higher mortality rates, and the intervention arm had a numerically lower mortality rate (14% versus 16.9%), although this was not statistically significant (possibly due to sample size).

The frequency of MRPs in this population is striking. Although the authors could not prove causality with this study design, clinical experience dictates that patients do occasionally suffer real harm from MRPs. This study not only calls attention to the problem but also suggests one possible solution, namely pharmacist involvement. There may be other solutions, such as better communication between practice sites through health information exchanges. If the frequency and potential harm of MRPs is replicated in other studies, this may represent a valuable addition to the growing list of quality measures for patients with cirrhosis as a surrogate outcome measure similar to hospital readmission.[8]

One limitation of this study is that patients were recruited from a single tertiary center. Data regarding medications prescribed and patients' outcomes were obtained through the medical records and data linkage provided by the Department of Health in Australia; this allowed the researchers to examine patient's health records at other health sites. Thus, the intervention may be difficult to reproduce in countries without adequate data linkage among sites. This would impact the ability for the pharmacist to counsel patients regarding their medications and to track MRPs. Such a limitation is nearly universal with interventional health care delivery studies because

care models are more difficult to replicate and scale than a pill.

Notwithstanding that limitation, the study by Hayward and colleagues clearly demonstrated that pharmacist involvement can decrease MRPs and possibly improve patient outcomes. It is likely that this benefit could be extended by also involving patients' caregivers in the pharmacist-led education and medication reconciliation, especially among those with more advanced liver disease and hepatic encephalopathy. Larger studies are needed to confirm this finding and reproduce it in other health care systems. Further studies may also tailor the intervention to the degree of risk for MRPs. Until then, we encourage readers to partner with local pharmacists on reducing MRPs among patients with cirrhosis.

Lydia Aye, D.O.
Michael Volk, M.D.
Division of Gastroenterology and Transplantation Institute
Loma Linda University Health
Loma Linda, CA

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