

were not fully captured in the current database.

Although HHC services are usually utilized to improve outcomes in high-risk patient groups, similar findings have been reported following decompensated HF.<sup>5</sup> Patients discharged with HHC after hospitalization for decompensated HF were found to have increased 30-day all-cause readmission rates and 30-day mortality.<sup>6</sup> In another study, HF patients receiving any home health aide visit had a greater likelihood of readmission and shorter time until readmission than those who did not.<sup>8</sup> Similar to our findings of increased comorbidities and in-hospital events within the HHC group, patients who were discharged with HHC within the National Inpatient Sample were more likely to be of older age, female gender, have higher illness severity scores, and have HF.<sup>9</sup>

As such, understanding the predictors for a HHC referral following TMVR and identifying this high rehospitalization and mortality risk subgroup of TMVR patients will assist in decision-making for heart teams. Patients recommended HHC on discharge due to their underlying co-morbidities and in-hospital events may require a targeted approach with transition of care and additional resources to prevent rehospitalization beyond what traditional home care provides. For example, combining home health care services with early physician follow-up has been shown to potentially reduce HF readmissions compared with either intervention alone.<sup>10</sup>

This study is limited by the database used, which lacks information on risk scores, laboratory/imaging parameters, and mid/long term outcomes. Although we attempted to reduce the effect of baseline co-morbidities through propensity-matched scoring, it is likely that patients within the HHC group had worse overall health compared with their matched counterparts. This has been identified as a source of bias showing worse outcomes in a propensity-matched cohort after HHC discharge following decompensated HF.<sup>6</sup> Regarding the 30-day mortality outcomes, the NRD does not record patients who may have died within the emergency department or outside the hospital; however, it is anticipated that

an equal number of patients from both groups would fall into this category resulting in a neutral effect on the results. Finally, frailty is a common indication for HHC discharge and would result in poorer outcomes within that group but is not captured within the NRD. Our analysis indicated that weight loss was a significant predictor for HHC discharge, but it remains unclear how many frail patients within the HHC group exist and their respective outcomes.

Despite these limitations, our study encompasses a large nationwide sample of patients reflecting current practices and identifies a group of TMVR patients at higher risk of worse outcome. Additional studies are needed to further assess the impact of HHC utilization at discharge and to determine other targeted interventions that can be used to improve outcomes in these patients.

## Disclosures

The authors declare no conflict of interest.

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## The Added Benefit of the CHADS2 Score



We read with interest the original article “Baseline CHADS2 score and risk of cardiovascular events in the population without atrial fibrillation” by Chunpeng Ji et al.<sup>1</sup> The study concludes “The baseline CHADS2 score is an independent risk factor for cardiovascular events and all-cause death in the population without atrial fibrillation.” This is an excellent prospective Chinese long-term study with meticulous follow-up once every 2 years from 2006/2007 to December 2016 (Kailuan



cohort study). Though conventionally CHADS2 score in patients with atrial fibrillation (AF) estimates the risk of ischemic stroke and thromboembolic events, but it also estimates the risk of major bleedings.<sup>2</sup> More than a decade ago, when vitamin K antagonists were commonly used to minimize the risk of ischemic stroke and thromboembolic events; to estimate bleeding risk HAS-BLED risk score was shown to have better discriminatory power than CHADS2/CHA2DS2-VASc risk scores.<sup>3</sup> Now in the contemporary practice as dual anticoagulant agents, are commonly used in patients with AF; CHADS2 score is shown to be as good as other bleeding specific risk scores like HAS-BLED, ORBIT, ATRIA to predict the risk of major bleedings.<sup>4</sup>

The risk of major bleeding increases pari passu with an increasing CHADS2 score.<sup>2</sup> Whether the CHADS2 or CHA2DS2-VASc score calculates the risk of bleeding in patients without AF is an open question, in search of an answer.

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## Statin Prescription Rates in Children With Severe Dyslipidemia in the United States

Low density lipoprotein cholesterol (LDL-C) in children has been shown to predict development of atherosclerotic disease in adulthood.<sup>1</sup> Statins are primarily used for lowering LDL-C exerting its effect through inhibition of hydroxymethylglutaryl coenzyme A reductase.<sup>2</sup>

Along with lifestyle modification, statins have been recommended for prevention of atherosclerotic cardiovascular disease (ASCVD) in adults. In children, although its use in specific conditions like familial hypercholesterolemia has been warranted, long-term safety issues have been one of the concerns in using it as a pharmacological agent to prevent ASCVD for children with severe dyslipidemia. There have been various guidelines on use of statin in children, with the 2011 National Heart, Lung, Blood Institute (NHLBI) guidelines being the most widely used in practice.<sup>3</sup> Therefore, we sought to examine rates of statin prescription in children screened for dyslipidemia to identify treatment gaps in a real-world contemporary setting.

## Methods

For our analysis, we used a deidentified, cloud-based national clinical database named Explorys (IBM) that collects data from inpatient and outpatient encounters from more than 360 medical centers covering 26 healthcare networks across the United States. Use of the Explorys registry has been deemed exempt from institutional review board approval by Rainbow Babies and Children's Hospital. We included all patients between age 10 and 19 years who had both LDL-C and pharmacy records documented between 2011 and 2019. We identified patients with 1 or more statin indications and analyzed them according to groups which were stratified based on 2011 NHLBI guidelines<sup>3</sup>: patients with LDL-C of 190 mg/dl or greater, LDL-C  $\geq 160$  to 189 mg/dl with either 1 high risk factor or  $\geq 2$  medium risk factor, LDL-C  $\geq 130$  to 159 mg/dl with either  $\geq 2$  high risk factor or  $\geq 1$  high risk factor +  $\geq 2$  medium risk factor. Positive family history of early ASCVD could not be

ascertained. We described statin use as prescription of any statin at any dose during the study period. Logistic regression was performed using IBM SPSS Statistics, version 24 (IBM Inc.) with age, sex, race, and insurance status acting as covariates with statin prescription as dependent variable.

## Results

Of the 1,750,980 patients with a qualifying lipid analysis, 4,000 children were eligible for a statin prescription for severe dyslipidemia as per NHLBI guidelines. Among those who were eligible, 1,100 children (27.5%) had an LDL-C of 190 mg/dl or greater. Only 1 in 8 children (n=500, 12.5%) with severe dyslipidemia were noted to have been started on a statin. The statin prescription rate was higher for patients aged 15 to 19 years and among females (Figure 1). With more severe elevations in LDL-C levels (LDL-C >250 mg/dl), statin use almost doubled with 23.4% (110/470) of patients being prescribed a statin. Presence of comorbidity significantly increased the rate of prescription of a statin to 33.3% in diabetes, 30.8% in hypertension, and 20% in obesity. With combination of comorbidities, prescription rates were higher (Figure 2). Multi-variable logistic regression demonstrated that males (adjusted odds ratio [aOR] 0.45, confidence interval [CI] 0.33 to 0.63, p <0.001) and Caucasian race (aOR 0.53, CI 0.38 to 0.74, p <0.001) with dyslipidemia were less commonly associated with statin prescription and those with public insurance were 1.4 times more commonly associated with statin prescription than private insurance or self-pay (aOR 1.4, CI 1.01 to 1.91, p = 0.03).

## Discussion

We sought to assess statin prescription rates among children with severe dyslipidemia using a real world population-based database. Overall, we demonstrate that statin has been underutilized among children, even in those with high LDL levels and multiple co-morbidities that predispose to early ASCVD.

Our findings raise the concern about the hesitancy among pediatric providers to start statin among children with severe dyslipidemia who are at high