

Patient Characteristic, Treatment Pattern and Healthcare Resource Utilisation of Obstructive Hypertrophic Cardiomyopathy (HCM) In China on A Cardiologist Survey

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INTRODUCTION

- Hypertrophic cardiomyopathy (HCM) is an often genetic disorder characterised by left ventricular hypertrophy (LVH) that cannot be explained by abnormal loading conditions [1,2]. HCM can be classified into two types: obstructive HCM and non-obstructive HCM. In terms of obstructive HCM, the wall between the two ventricular chambers of the heart thickens, and the chamber can become stiff. This may lead to blockages or reduced blood flow from the left ventricle to the aorta [3].
- According to the 2023 Guideline for Diagnosis and Treatment of Patients with Hypertrophic Cardiomyopathy [4], two categories of treatments are available for obstructive HCM: drug therapy and septal reduction therapy (SRT) in China. Mavacamten, a first-in-class, allosteric inhibitor of β -cardiac myosin, was recently approved in China, offering a new and promising option based on EXPLORE-CN [5], which demonstrated a favourable clinical profile.

OBJECTIVES

- This study aimed to investigate patient characteristics, treatment patterns, healthcare resource utilisation (HCRU) and indirect costs of obstructive HCM patients by New York Heart Association (NYHA) functional class in China. Additionally, prediction of patient management and patient behaviour with mavacamten were surveyed for economic analysis due to a lack of real-world clinical practice of mavacamten in China.

METHODS

- A survey was performed among a group of experienced cardiologists to extract summaries of information upon their diagnosed obstructive HCM cohort. The survey consisted of two sequential phases (Table 1).

Table 1. Procedure and features of the survey

Phase	Features
Phase 1: in-depth interview	<ul style="list-style-type: none">Semi-structured discussion guide
Phase 2: online questionnaire	<ul style="list-style-type: none">Self-reported structured e-questionnaire designed based on feedbacks from phase 1Consisting of multiple-choice or fill-in-the-blank questions

- The data collected in both phase 1 & 2 underwent independent validation by two researchers to ensure accuracy. Any corrected answers obtained from callbacks replaced original data. For categorical variables, counts and percentages of the total were presented. Continuous variables were described using mean values unless otherwise stated.

RESULTS

Cardiologist Profiles

- 5 cardiologists were interviewed in phase 1, and 30 cardiologists completed the online questionnaire in phase 2. In total, 35 associate chief or chief physicians from 29 tier 3 hospitals (highest level in China, typically large, comprehensive medical centers) were included in the survey, located in northern (11), southern (8), eastern (9) and western (7) China, respectively. All had experience in treating a minimum of 4 obstructive HCM patients monthly.

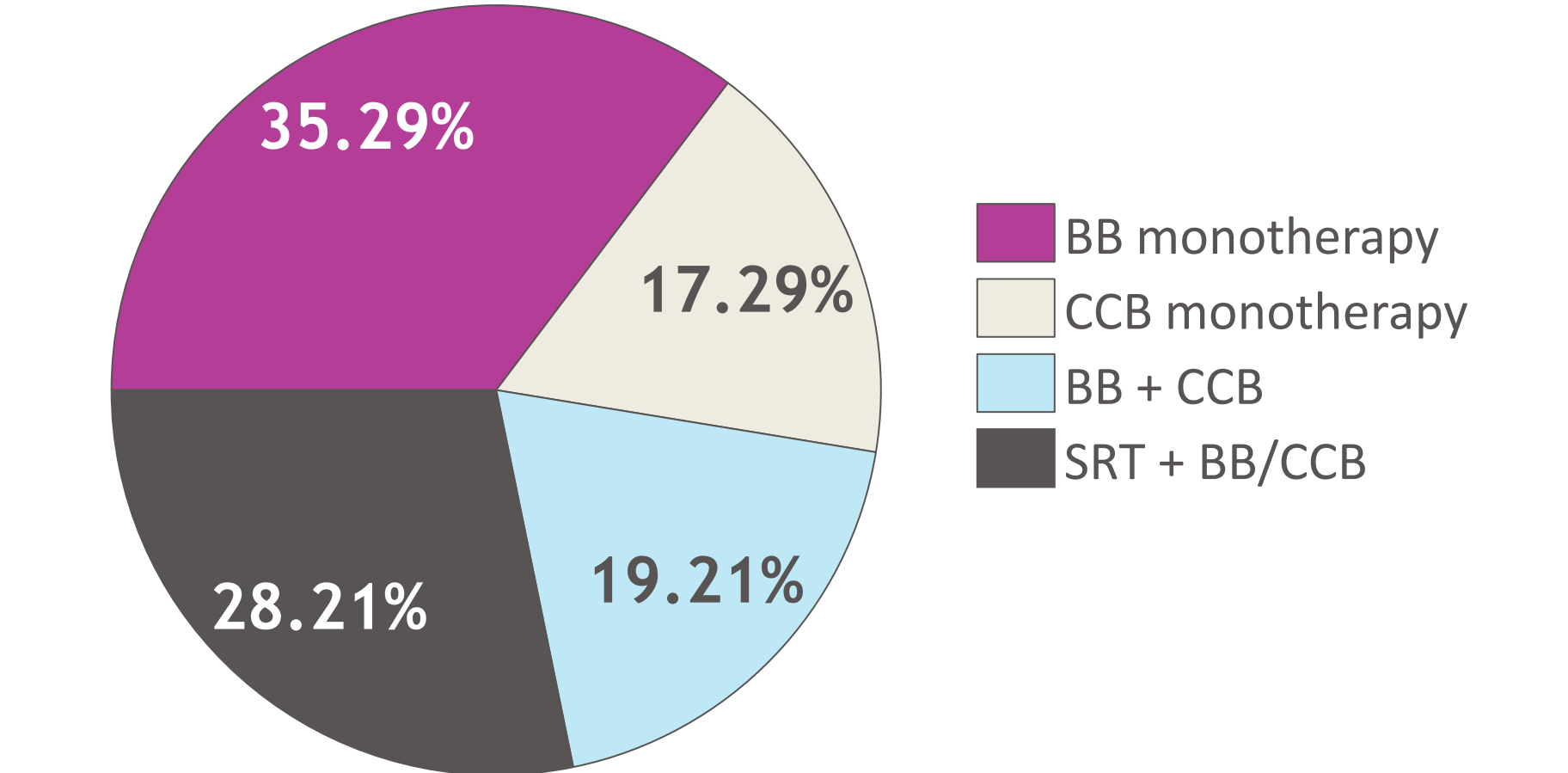
Characteristics of Obstructive HCM Patients in China

- The proportion of diagnosed obstructive HCM among HCM seen by physicians in China was estimated at about 17.61%, with prevalence increasing by 9.84% per annum.
- Within this population, 47.50% were classified as NYHA II-III and 60.41% of these NYHA II-III patients with left ventricular ejection fraction (LVEF) \geq 55%.

Current Treatment Landscape

- Among diagnosed symptomatic (NYHA II-III) obstructive sub-type cases, beta-blocker (BB) / calcium channel blocker (CCB) monotherapy (without prior SRT) was most prevalent (52.58%) followed by monotherapy with prior SRT (28.21%) and BB+CCB combination (19.21%) (Figure 1).
- Among obstructive HCM patients receiving SRT, the distribution of three SRT options was as follows: alcohol septal ablation was the most common (41.39%), followed by radiofrequency septal ablation (37.55%), and septal myectomy (21.06%).
- Patients on BB/CCB monotherapy often need SRT escalation due to insufficient response or disease progression, with the annual percentage of these obstructive HCM patients receiving SRT being 16.37% (NYHA I), 21.40% (NYHA II), 32.80% (NYHA III), and 39.26% (NYHA IV), respectively.

Figure 1. Proportions of therapies used in China



Abbreviation: BB, beta-blocker. CCB, calcium channel blocker. SRT, septal reduction therapy.

Healthcare Resource Utilisation Cost

- The frequencies of healthcare utilisation (including outpatient visits (OP), emergency room visits (ED), hospitalisations, cardiovascular-related intensive care units (ICUs), and tests) increased with the deteriorating NYHA condition (Table 2).
- Total direct medical costs for items in Table 2 for NYHA I - IV obstructive HCM patients were ¥14,123, ¥56,078, ¥112,505, and ¥180,722 per annum, respectively.
- In addition, the one-time terminal care cost for obstructive HCM was estimated to be ¥22,900.

Indirect Costs/ Productivity Loss

- 55% of obstructive HCM patients are of working age.
- The impact on productivity loss was probed by NYHA classifications, with 16% to 75% of productivity loss for NYHA I-IV, respectively.
- Regarding caregiver support, 0, 70, 157, 290 hours per month are required for caring for NYHA I-IV patients.

Predicted Patient Management and Patient Behaviour with Mavacamten + BB/CCB

- Cardiologists were surveyed about mavacamten, a newly approved cardiac myosin inhibitor in China, compared to BB/CCB on prediction of patient management and patient behaviour.

Table 2. Annual frequency of visit, hospitalisation, ICU and testing and relevant unit cost by NYHA functional class

Annual frequency	NYHA I	NYHA II	NYHA III	NYHA IV	Unit Costs (¥)
Cardiovascular-related outpatient visits	5.10	7.09	11.05	11.05	25
Emergency department visit	1.37	3.91	6.05	6.05	500
Hospitalisation (without ICU)	0.48	1.50	2.55	3.89	14,871
Cardiovascular-related ICU	0.00	0.63	1.53	2.90	35,249
Echocardiogram	2.57	3.71	6.23	6.23	276
Electrocardiogram	3.35	4.27	7.42	7.42	29
Cardiovascular magnetic resonance imaging	0.94	1.28	2.26	2.26	1,475
Computed Tomography	1.18	1.86	2.89	2.89	751
Cardiopulmonary Exercise Testing	1.25	1.96	5.00	5.00	608
BNP and NT-proBNP testing	2.35	3.89	7.81	7.81	210
Troponin T and I test	2.73	3.29	7.24	7.24	148
Holter	1.82	4.36	6.33	6.33	235
Stress test	1.13	1.66	3.00	3.00	895
Total cost per annum (¥)	14,123	56,078	112,505	180,722	

Abbreviation: ICU, intensive care unit. NYHA, New York Heart Association. BNP, B-type natriuretic peptide. NT-proBNP, N-terminal pro b-type natriuretic peptide.

- Cardiologists expected monitoring within the titration period to be higher for mavacamten compared to BB/CCB. With mavacamten + BB/CCB (vs. BB/CCB), patients were predicted to require 10.03 (vs. 9.37) and 7.67 (vs. 5.87) visits per annum for heart rate/blood pressure and ECHO monitoring respectively.
- Among obstructive HCM patients treated with mavacamten for 30 weeks, cardiologists projected that in real-world clinical practice, about a median value of 10.00% (interquartile range: 5.00%-20.00%) would discontinue mavacamten due to LVEF decline or serious adverse events.
- 61.76% of physicians surveyed would consider discontinuing mavacamten if patients' NYHA functional class worsened by one level during maintenance period.

Discussion

- Cardiologists considered discontinuation of mavacamten due to LEVF decline, which was more a preventative measure. Clinical studies indicated that only a few patients developed LVEF $<$ 50%, and it normalised after temporary interruption of therapy, and no serious heart failure occurred [3,5].
- New treatments that mitigate risk of deterioration in NYHA status have the potential to improve outcomes and reduce HCRU.

Conclusion

- Patients in China with obstructive HCM predominantly received drug therapies with limited second-line treatments available. As the NYHA status worsened, there was a notable increase in the economic burden.

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Disclosure

- ZT is a chief physician employed at Peking Union Medical College Hospital and was responsible for directing this study.
- YJ works at Bristol Myers Squibb.
- XM, HMC, JPW and JM are current employees of IQVIA, which received funding from Bristol Myers Squibb for this study.
- The authors declare no conflicts of interest related to this study.