Impact of Guideline-Directed Medical Therapies on Clinical and Economic Outcomes in Non-obstructive Hypertrophic Cardiomyopathy: Analysis of Data from a Multinational Cross-Sectional Survey

Paulos Gebrehiwet[1], James Jackson[2], Lucy Hargreaves[2], Sophie Barlow[2], Laura LeBrocq[2], Johan Brekke[3], Michael Butzner[3], Sanatan Shreay[3], Punag Divanji[3]

[1]Cytokinetics, Incorporated, Zug, Switzerland; [2]Adelphi Real World, Bollington, UK; [3]Cytokinetics, Incorporated, South San Francisco, CA, USA

BACKGROUND

- Non-obstructive hypertrophic cardiomyopathy (nHCM) affects approximately half of patients with hypertrophic cardiomyopathy (HCM).[1]
- There are no approved therapies for nHCM.[2-4] Due to lack of evidence in nHCM, current guideline-directed medical therapy (GDMT) draw on recommendations from obstructive HCM (oHCM) with focus on beta-blockers, calcium channel blockers, or disopyramide.[5,6]
- The impact of GDMT on clinical and economic outcomes in nHCM remains unclear.

PURPOSE

- Characterize and compare the clinical and economic outcomes of patients with nHCM currently receiving treatment following guideline recommendations (guideline-treated) vs those who did not (non–guideline-treated).

METHODS

Study Design

- Between July 2022 and October 2024, data were drawn from the Adelphi Real World HCM Disease Specific Programme™ (DSP™), a multinational, cross-sectional survey conducted in the United States and Europe (Italy, Spain).
- The DSP methodology details were previously described, validated, and demonstrated to be representative and consistent over time.[7-9]
- Briefly, cardiologists completed questionnaires on demographic and clinical characteristics, symptoms, and healthcare resource utilization (HCRU) for their patients with nHCM, and patients completed EQ-5D-5L and EQ-VAS questionnaires.

Statistical Analysis

- GDMT was defined as patients who received ≥1 of the following treatments: a non-vasodilating beta-blocker (metoprolol, bisoprolol, propranolol, atenolol, or nadolol), a non-dihydropyridine calcium channel blocker (verapamil or diltiazem), or disopyramide.
- Outcomes were compared between patients who received GDMT and those who did not using Mann-Whitney U tests for ordered categorical, Fisher's exact for nominal categorical, or t-tests for continuous outcomes (P<0.05 considered significant).

Outcomes

- Clinical outcomes, including symptoms and cardiovascular (CV) comorbidities, were collected.
- HCRU (ie, hospitalizations, emergency room [ER] visits, day visits, caregiver support) and quality of life (QoL) assessed by EQ-5D-5L and EQ-VAS were measured.
- Mean (SD) was reported for utilization and QoL (EQ-5D-5L; US value set); symptoms and comorbidities with prevalence >5% were summarized as percentages.

RESULTS

Patient Population

- Demographics and characteristics for all patients (N=723) and of the GDMT and No GDMT groups are shown in **Table 1**.
- Of 723 patients, mean age was 55.11 years and 61.41% were male.
- Overall, 78.42% of patients were in New York Heart Association functional class II.
- The mean time since diagnosis was 2.72 years.
- 70.40% received GDMT, for a mean duration of 1.93 years.

Table 1: Patient demographics and characteristics

	All patients with nHCM N=723	GDMT n=509	No GDMT n=214
Age, years	N=723	n=509	n=214
Mean (SD)	55.11 (14.92)	56.39 (14.03)	52.09 (16.48)
Time since first onset of symptoms, years	n=141	n=103	n=38
Mean (SD)	3.16 (3.63)	3.24 (3.68)	2.94 (3.54)
Time since HCM diagnosis, years	n=651	n=463	n=188
Mean (SD)	2.72 (3.92)	3.02 (4.08)	1.98 (3.39)
Total GDMT duration, years	n=413	n=413	n=0
Mean (SD)	1.93 (1.96)	1.93 (1.96)	NA
Biologic sex	n=723	n=509	n=214
Male	444 (61.41)	316 (62.08)	128 (59.81)
Female	279 (38.59)	193 (37.92)	86 (40.19)
Region	n=723	n=509	n=214
Italy	243 (33.61)	174 (34.18)	69 (32.24)
Spain	240 (33.20)	166 (32.61)	74 (34.58)
USA	240 (33.20)	169 (33.20)	71 (33.18)
Current NYHA classification	n=723	n=509	n=214
I	81 (11.20)	41 (8.06)	40 (18.69)
II	567 (78.42)	407 (79.96)	160 (74.77)
III	68 (9.41)	57 (11.20)	11 (5.14)
IV	7 (0.97)	4 (0.79)	3 (1.40)

All data are n (%) unless otherwise indicated.
GDMT, guideline-directed medical therapy; HCM, hypertrophic cardiomyopathy; NA, not available; nHCM, non-obstructive hypertrophic cardiomyopathy; NYHA, New York Heart Association.

Clinical Outcomes

- GDMT patients had a significantly higher rate of dyspnea on activity, fatigue/weakness, and chest pain on activity (P<0.05 for all) compared with No GDMT patients.
- CV comorbidities, including hypertension, atrial fibrillation/atrial flutter, and heart failure (P<0.05 for all), were also more prevalent in GDMT vs No GDMT patients (**Table 2**).

Economic Outcomes

- In the prior 12 months, a higher proportion of GDMT vs No GDMT patients experienced ≥1 HCRU event (36.22% vs 10.42%; P<0.05) (**Table 3**).
- HCRU was higher among GDMT patients, with more HCM-related ER visits and day visits (P<0.05 for both) (**Figure 1**).
- Furthermore, patients receiving GDMT demonstrated lower QoL scores on the EQ-5D-5L and EQ-VAS compared with those not receiving GDMT, but this was not statistically significant (P>0.05 for both) (**Figure 2**).

Table 2: Clinical outcomes (HCM symptoms and CV comorbidities)

	All patients with nHCM N=723	GDMT n=509	No GDMT n=214	*P* value
Proportion of patients currently experiencing 5 key symptoms[a]	n=707	n=505	n=202	
Currently experiencing symptoms	648 (91.65)	479 (94.85)	169 (83.66)	<0.0001
Not currently experiencing symptoms	59 (8.35)	26 (5.15)	33 (16.34)	
Current symptoms among patients with symptoms[b]	n=677	n=493	n=184	
Dyspnea when active	556 (82.13)	419 (84.99)	137 (74.46)	0.0022
Fatigue / weakness	216 (31.91)	175 (35.50)	41 (22.28)	0.0011
Palpitations	182 (26.88)	139 (28.19)	43 (23.37)	0.2423
Chest pain when active	117 (17.28)	98 (19.88)	19 (10.33)	0.0029
Dizziness	61 (9.01)	49 (9.94)	12 (6.52)	0.1783
Edema	57 (8.42)	49 (9.94)	8 (4.35)	0.0193
Dyspnea when at rest	55 (8.12)	42 (8.52)	13 (7.07)	0.6361
Total number of 5 key symptoms experienced[a]	n=707	n=505	n=202	
0 (no symptoms experienced)	59 (8.35)	26 (5.15)	33 (16.34)	<0.0001
1	316 (44.70)	207 (40.99)	109 (53.96)	
2	210 (29.70)	171 (33.86)	39 (19.31)	
3	93 (13.15)	74 (14.65)	19 (9.41)	
4	28 (3.96)	26 (5.15)	2 (0.99)	
5 (all symptoms experienced)	1 (0.14)	1 (0.20)	0 (0.00)	
CV comorbidities[b]	n=723	n=509	n=214	
Hypertension	198 (27.39)	156 (30.65)	42 (19.63)	0.0025
Atrial fibrillation / atrial flutter	142 (19.64)	118 (23.18)	24 (11.21)	0.0001
Heart failure	75 (10.37)	61 (11.28)	14 (6.54)	0.0320
Left atrial dilation	51 (7.05)	39 (7.66)	12 (5.61)	0.4262

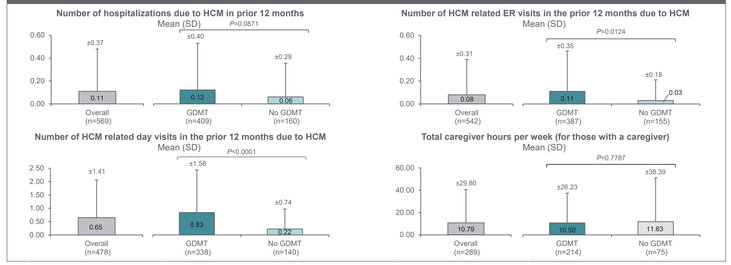
All data are n (%) unless otherwise indicated.
[a] 5 symptoms include dyspnea when active, fatigue/weakness, palpitations, chest pain when active, and dizziness.
[b] Reported for >5% of the population.
CV, cardiovascular; GDMT, guideline-directed medical therapy; HCM, hypertrophic cardiomyopathy; nHCM, non-obstructive hypertrophic cardiomyopathy; NYHA, New York Heart Association.

Table 3: Economic outcomes (HCRU and QoL)

	All patients with nHCM N=723	GDMT n=505	No GDMT n=214	*P* value
Number of HCM-related hospitalizations in the last 12 months	n=569	n=409	n=160	
Mean (SD)	0.11 (0.37)	0.12 (0.40)	0.06 (0.29)	0.0871
Number of HCM-related ER visits in the last 12 months	n=542	n=387	n=155	
Mean (SD)	0.08 (0.31)	0.11 (0.35)	0.03 (0.18)	0.0124
Number of HCM-related day visits in the last 12 months	n=478	n=338	n=140	
Mean (SD)	0.65 (1.41)	0.83 (1.58)	0.22 (0.74)	<0.0001
Total caregiver hours per week (for those with a caregiver)	n=289	n=214	n=75	
Mean (SD)	10.79 (29.80)	10.50 (26.23)	11.63 (38.39)	0.7787
HCRU in the last 12 months[a], n (%)	n=175	n=127	n=48	
HCRU use	51 (29.14)	46 (36.22)	5 (10.42)	0.0007
No HCRU use	124 (70.86)	81 (63.78)	43 (89.58)	
EQ-5D-5L[b] (US value set)	n=92	n=68	n=24	
Mean (SD)	0.87 (0.17)	0.87 (0.16)	0.90 (0.18)	0.4454
EQ-VAS[b]	n=90	n=67	n=23	
Mean (SD)	78.99 (14.02)	77.75 (12.63)	82.61 (17.27)	0.1523

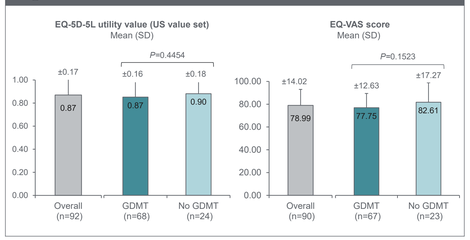
[a] HCRU in the last 12 months is defined as the proportion of patients who have/have not experienced any of the following HCRU events in the last 12 months: HCM-related hospitalizations, HCM-related ER visits, HCM-related day visits, and hours of care >0.
[b] *P* values should be interpreted with caution due to low sample sizes.
ER, emergency room; GDMT, guideline-directed medical therapy; HCM, hypertrophic cardiomyopathy; HCRU, healthcare resource utilization; nHCM, non-obstructive hypertrophic cardiomyopathy; QoL, quality of life; VAS, visual analog scale.

Figure 1: HCRU



HCRU in the last 12 months is defined as the proportion of patients who have/have not experienced any of the following HCRU events in the last 12 months: HCM-related hospitalizations, HCM-related ER visits, HCM-related day visits, and hours of care >0.
ER, emergency room; GDMT, guideline-directed medical therapy; HCM, hypertrophic cardiomyopathy; HCRU, healthcare resource utilization; nHCM, non-obstructive hypertrophic cardiomyopathy;

Figure 2: QoL



P-values should be interpreted with caution due to low sample sizes.
EQ-5D-5L, EuroQol 5-Dimension 5-Level; GDMT, guideline-directed medical therapy; QoL, quality of life; VAS, visual analog scale

Limitations

- Data from the survey were cross-sectional, with limited information about individual patient journeys or disease trajectory.
- Participation is affected by the willingness to complete the survey and may not reflect a random sample of cardiologists or patients with nHCM.
- The study results were not adjusted for patient characteristics, including age, disease duration, and disease severity.

CONCLUSIONS

- Two-thirds of patients with nHCM received GDMT. Despite the high proportion of patients with nHCM receiving GDMT, patients continued to experience substantial clinical and economic burden when compared with those not treated according to guideline recommendations.
- These findings highlight the urgent need for novel therapies that address the underlying disease mechanisms of nHCM to reduce symptoms and improve QoL.

References

1. Butzner M, et al. *JACC Adv* 2026;5(2):102552. 2. Masri A, et al. *Eur J Heart Fail* 2024;26(9):1993-8. 3. Masri A, et al. *J Card Fail* 2026;32(2):533-7. 4. Desai MY, et al. *N Engl J Med* 2025;393(10):961-72. 5. Ommen SR, et al. *J Am College Cardiol* 2024;83(23):2324-405. 6. Arbelo E, et al. *Eur Heart J* 2023;44(37):3503-626. 7. Anderson P, et al. *Curr Med Res Opin* 2008;24(11):3063-72. 8. Anderson P, et al. *Curr Med Res* 2023;39(12):1707-15. 9. Babineaux SM, et al. *BMJ Open* 2016;6(8):e010352.

Disclosures

PG, JB, MB, SS, PD: Employees of and hold stock in Cytokinetics, Incorporated;
JJ, LH, SB, LL: Employees of Adelphi Real World.

Acknowledgments

This study was funded by Cytokinetics, Incorporated. Editorial support for this presentation was provided by David Sunter, PhD, on behalf of Engage Scientific Solutions and was funded by Cytokinetics, Incorporated.

Cytokinetics®

Presented at the 2026 European Society of Cardiology (ESC) Heart Failure Congress | Barcelona, Spain | May 9–12, 2026