BAROSTIM™ therapy in patients with heart failure with a reduced ejection fraction, impact in women

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OBJECTIVE

Evaluate if Baroreflex Activation Therapy (BAT) improves heart failure (HF) symptoms in women with heart failure with a reduced ejection fraction (HFrEF) on guideline-directed medical and device therapy (GDMT).

BACKGROUND

HFrEF affects over a million women in the United States and is associated with poor life expectancy, frequent HF hospitalizations, lower quality of life (QoL), and substantial limitation in exercise capacity. Women account for nearly half of all HF hospital admissions.

METHODS

A novel prospective controlled trial randomized subjects with an unmet clinical need to ongoing GDMT (Control) or ongoing GDMT plus BAT. Eligibility included HFrEF patients with:

- NYHA Functional Class III or II (with recent history of III)
- Left ventricular ejection fraction ≤ 35%
- Six-minute hall walk distance (6MHW) 150 – 400 m
- Elevated NT-proBNP or previous HF hospitalization
- Stable optimal medical therapy ≥ 4 weeks
- No indicatation for cardiac resynchronization therapy
- No restriction on AF, QRS width or concomitant devices

The six month effectiveness endpoints included changes in 6MHW, Minnesota Living with Heart Failure (MLWHF) QoL score, NT-proBNP and NYHA Class. The safety endpoint was device- or procedure-related major adverse neurological and cardiovascular events (MANCE) in the BAT arm only.

RESULTS

Of the 264 subjects randomized, 53 (20%) were women. As shown in Table 1, women had a worse (higher) QoL score ($p<0.01$) at baseline, higher NT-proBNP, and were less likely to have a history of AF and coronary artery disease than men. Medication and ICD usage was similar in women versus men. As shown in Table 2, BAT was safely delivered and provided significant improvement in 6MHW, MLWHF QoL, NT-proBNP levels and NYHA Class in both women and men with HFrEF.

Table 1: Demographics by Gender

Baseline Variable	Women (n=53)	Men (N=211)
Age (years)	61 ± 11	63 ± 11
Race: Caucasian	70%	74%
NYHA: Class III	91%	95%
MLWHF QOL Score*	62 ± 22	50 ± 24
6MHW Distance (m)	289 ± 75	309 ± 70
LVEF (%)	28 ± 5	27 ± 6
NT-pro BNP** (pg/mL)	797 [516, 967]	719 [473, 1058]
Atrial Fibrillation	32%	37%
Coronary Artery Disease	53%	68%
ACE-I/ARB/ARNI	83%	87%
Beta-Blocker	94%	95%
Diuretic	83%	87%
ICD	77%	79%

*p-value <0.01; **Median [IQR]

Table 2: Six Month Results by Gender

Endpoint	Women			Men		
	BAT (N=23)	Control (N=26)	Diff†	BAT (N=97)	Control (N=99)	Diff†
MANCE-free rate	96%			97%*		
6MHW (meters)	44 ± 45	-32 ± 118	81*	50 ± 71	-1.5 ± 78	55*
MLWHF QoL (points)	-34 ± 27	-9.0 ± 23	-23*	-18 ± 24	-5.5 ± 19	-12*
NT-proBNP (% Reduction)	-43% ± 0.3	7.4% ± 0.3	-48%*	-15% ± 0.4	2.3% ± 0.3	-17%
NYHA Class (% Improve)	70%	27%	43%*	64%	32%	32%*

*p-value <0.01; Note: No significant interaction p-values between women and men
†Data = all differences analyzed by ANCOVA adjusted for baseline values

CONCLUSION

BAT is safe and improves symptoms, exercise capacity and QoL in both GDMT treated women and men with NYHA Class II/III HFrEF.

Declaration of interest: This study was funded by CVRx. Lindenfeld is a consultant for Abbott, Astra-Zeneca, Boehringer-Ingelheim, CVRx, Edwards Lifesciences, Impulse Dynamics, Vwave and received grants from Astra-Zeneca, Sensible Medical, Volumetrix

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