Response by Fujisawa et al to Letter Regarding Article, "Pulmonary Artery Denervation by Determining Targeted Ablation Sites for Treatment of Pulmonary Arterial Hypertension"

In Response:

We appreciate the interest and comments from Drs Kuebler and Friedberg on our article.[1] They pointed out that a reduction in heart rate improved right ventricular failure in an experimental model of pulmonary arterial (PA) hypertension. In addition, they suggested that tachycardia would worsen the ventricular diastolic failure and that the negative chronotropic interventions may be beneficial for ventricular function and vascular remodeling. In our patient,[1] there was no reduction in heart rate (100–105 bpm) shortly after the PA denervation procedure. Heart rate decreased to 90 bpm at 1 and 4 months after the procedure, whereas mean PA pressure decreased from 65 to 56 mm Hg. Daily average heart rate was not evaluated, but the patient did not receive drugs with negative chronotropic effects, such as β-blockers or calcium channel blockers. In the study by Zhou et al,[2] heart rate did not decrease after PA denervation in an animal model. In addition, in a case report from Zhang et al,[3] there was no change in heart rate after PA denervation in a patient with pulmonary hypertension secondary to left heart disease, whereas hemodynamics improved. Conversely, in a phase II study,[4] patients without PA hypertension-related events at the 1-year follow-up after PA denervation had a slower resting heart rate. Thus, changes in heart rate after PA denervation seem to be inconsistent. Future studies on a large number of cases are needed to elucidate heart rate changes after PA denervation. The slower heart rate could be brought about by an autonomic effect of sympathetic nerve denervation or by an improvement in right-sided heart failure. The causality between decreased heart rate and PA denervation remains to be clarified.

Disclosures

None.

Taishi Fujisawa, MD
Masaharu Kataoka, MD
Takashi Kawakami, MD
Sarasa Isobe, MD
Kazuaki Nakajima, MD
Akira Kunitomi, MD
Shin Kashimura, MD
Yoshinori Katsumata, MD
Takahiko Nishiyama, MD
Takehiro Kimura, MD
Nobuhiro Nishiyama, MD
Yoshiyasu Aizawa, MD
Mitsushige Murata, MD
Keiichi Fukuda, MD
Seiji Takatsuki, MD
Department of Cardiology
Keio University School of Medicine
Tokyo, Japan

References

1. Fujisawa T, Kataoka M, Kawakami T, Isobe S, Nakajima K, Kunitomi A, Kashimura S, Katsumata Y, Nishiyama T, Kimura T, Nishiyama N, Aizawa Y, Murata M, Fukuda K, Takatsuki S. Pulmonary artery denervation by determining targeted ablation sites for treatment of pulmonary arterial hypertension. *Circ Cardiovasc Interv*. 2017;10:e005812. doi: 10.1161/CIRCINTERVENTIONS.117.005812.
2. Zhou L, Zhang J, Jiang XM, Xie DJ, Wang JS, Li L, Li B, Wang ZM, Rothman AMK, Lawrie A, Chen SL. Pulmonary artery denervation attenuates pulmonary arterial remodeling in dogs with pulmonary arterial remodeling in dogs with pulmonary arterial hypertension induced by dehydrogenized monocrotaline. *JACC Cardiovasc Interv*. 2015;8:2013–2023. doi: 10.1016/j.jcin.2015.09.015.
3. Zhang H, Zhang J, Xie DJ, Jiang X, Zhang FF, Chen SL. Pulmonary artery denervation for treatment of a patient with pulmonary hypertension secondary to left heart disease. *Pulm Circ*. 2016;6:240–243. doi: 10.1086/685550.
4. Chen SL, Zhang H, Xie DJ, Zhang J, Zhou L, Rothman AM, Stone GW. Hemodynamic, functional, and clinical responses to pulmonary artery denervation in patients with pulmonary arterial hypertension of different causes: phase II results from the Pulmonary Artery Denervation-1 study. *Circ Cardiovasc Interv*. 2015;8:e002837. doi: 10.1161/CIRCINTERVENTIONS.115.002837.

(*Circ Cardiovasc Interv*. 2018;11:e006244. DOI: 10.1161/CIRCINTERVENTIONS.117.006244.)

Response by Fujisawa et al to Letter Regarding Article, "Pulmonary Artery Denervation by Determining Targeted Ablation Sites for Treatment of Pulmonary Arterial Hypertension"

Taishi Fujisawa, Masaharu Kataoka, Takashi Kawakami, Sarasa Isobe, Kazuaki Nakajima, Akira Kunitomi, Shin Kashimura, Yoshinori Katsumata, Takahiko Nishiyama, Takehiro Kimura, Nobuhiro Nishiyama, Yoshiyasu Aizawa, Mitsushige Murata, Keiichi Fukuda and Seiji Takatsuki

Circ Cardiovasc Interv. 2018;11:
doi: 10.1161/CIRCINTERVENTIONS.117.006244
Circulation: Cardiovascular Interventions is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231

Print ISSN: 1941-7640. Online ISSN: 1941-7632