

# The Effect of Exercise on Endothelin-1 Level in Patients With Pulmonary Hypertension

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## Background

- Endothelin-1 (ET-1), a potent vasoconstrictor, is elevated in heart failure as well as in pulmonary arterial hypertension (PAH).
- Exercise induced pulmonary arterial hypertension (Exercise PAH) is defined when mPA is increases > 30 mmHg and PW < 20 mmHg with exercise, whereas exercise induced pulmonary hypertension with heart failure (Exercise D-PH) is defined when mPA increases > 30 mmHg and PW > 20 mmHg with exercise.
- To our knowledge, there is no known level of ET-1 in exercise conditions.

## Aim

To assess effect of exercise on ET-1 levels in different types of pulmonary hypertension.

## Methods

- A prospective study measuring ET-1 level in patient with PAH, heart failure induced pulmonary hypertension (D-PH), Exercise PAH, Exercise-DPH and normal control both at rest and at peak exercise.
- Demographics and echo data were collected.
- Right heart catheterization was done to confirm diagnosis and type of pulmonary hypertension, which was followed by arm lifting exercise for 3 minutes (30 watts or 40 kgm/min) and decrease of MV02 by > 10% using different weights.
- Blood samples were collected to measure ET-1 level using ET-1 ELISA.

## Disclosure

Arif Albulushi: no disclosure  
Kajari Dhar: no disclosure  
Douglas Stoller: no disclosure  
Marshall Hyden: no disclosure  
Adam Burdorf: no disclosure  
Brian Lowes: no disclosure  
Ronald Zolty: no disclosure

## Results

- A total of 77 patients were included in this study. 10 control, 18 patients with D-PH, 22 patients with PAH, 15 patients with Exercise D-PH and 12 patients with Exercise PAH.
- At rest, ET-1 level was higher in Exercise PAH compared to other groups, 3.6 +/- 2 with p value of 0.04.
- At peak exercise, ET-1 level was higher in PAH compared to other groups, 2.91 +/- 1.8 with p value of 0.05 (figure 1).
- Patients with D-PH had more evidence of diabetes mellitus, obesity, right ventricle failure, dilated right atrium and were more elderly male.

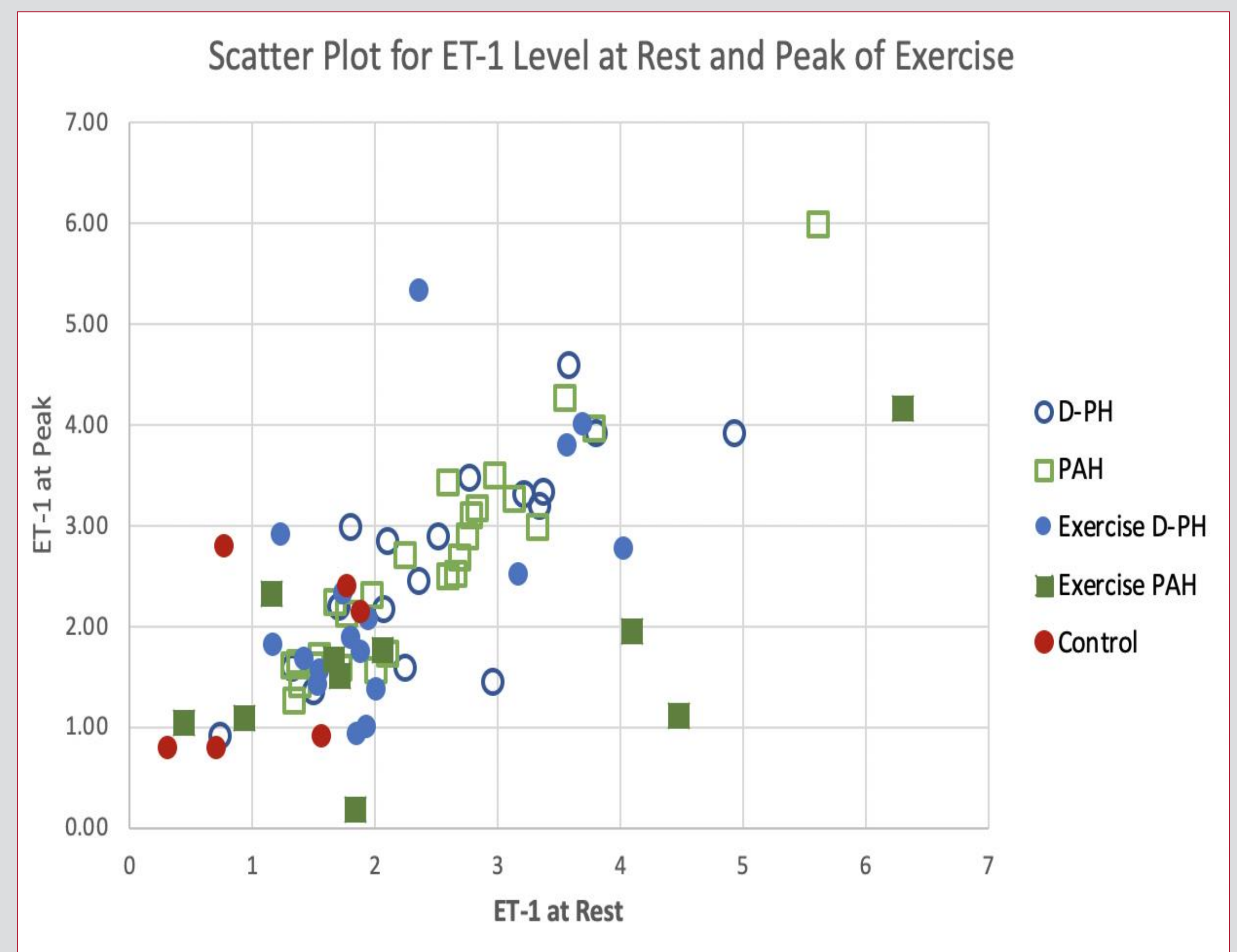


Figure 1: ET-1 level both at rest and peak exercise at different pulmonary hypertension groups.

## Conclusion

- At rest, ET-1 level is higher in patients with Exercise PAH, whereas at peak exercise, is higher in patients with PAH.
- Patients with D-PH have more cardiac risk factors with evidence of right sided failure.