Prognosis of patients with pulmonary artery hypertension (PAH) has been progressing a great deal in recent years contributed by development of various kinds of pulmonary artery (PA) vasodilators, aggressive use of nonparenteral prostanoids, initial combination treatment and so on. According to an analysis on PAH patients in 8 representative Japanese centers, 3-year survival was 96% when the study subjects were confined to the treatment naïve ones. In order to fill the remaining patients unresponsive to the present renovated strategies, suppressing exercise according to the severity of pulmonary hypertension may be effective in addition to responding to the existing strategies more efficiently in the patients with good prognosis. Why I propose this measure is that exercise restriction is not well recognized not only in many physicians in charge of PAH patients but the patients themselves.

PAH occurs through thickening of the media and proliferation of the intima, or thick vascular wall in small PAs. Laplace’s law indicates that vessel wall has to hypertrophy when the intravascular pressure rises in order to minimize vessel wall stress, meaning more exercise increases pulmonary flow leading to increased PA pressure and resultant PA wall hypertrophy. And it has been reported that reduction in PA pressure will cause PA reverse remodeling, in other words thinning of thickened PA wall. Strong pulmonary vasodilators dilate pulmonary arteries resulting in relative PA wall thinning but are counteracted by above-mentioned exercise and exercise-induced PA wall thickening. Therefore, restricting exercise resists exercise-induced PA wall thickening and assists pulmonary vasodilators’ effect of PA wall thinning. Actually we have sometimes experienced that complete bed rest due to other comorbid conditions for a month or so did decrease mean PA pressure in PAH patients, say as high as 10 mmHg.

In my presentation I will talk on several patients whose hemodynamics were influenced by exercise and rest, how to control exercise intensity in PAH patients and how to utilize activity measurement to direct patients’ activity level.

Pulmonary hypertension (PH) is characterized by an increase in precapillary pulmonary vascular resistance with reduced cardiac output, which cause dyspnea on exertion and limited exercise capacity. Recent medical progress in the management of patients with pulmonary arterial hypertension (PAH) (e.g., specific vasoactive medical therapy) has shown to improve pulmonary hemodynamics and strengthen right ventricular function. Regarding exercise training for PH, although patients with PH had been conventionally recommended to avoid excessive physical activity that leads to distressing symptoms, evidence for a beneficial effect on pulmonary hemodynamics and functional capacity has been growing during the past decade. Accordingly, recent guidelines of PH recommend that exercise training programs should be implemented under supervision in centers experienced in PH patients and rehabilitation of compromised. However, the optimal method of pulmonary rehabilitation and the intensity and duration of the training remains unknown. Additionally, the characteristics of the supervision and the mechanisms for the improvement of symptoms and functional capacity are still unclear.

Here in this session, I’ll review these guidelines and randomized controlled trials demonstrating an improvement in exercise and functional capacity and in quality of life in patients with PH who took part in a training program as compared with an untrained control group. Additionally, the safety and careful patients selection in exercise training for PH will be discussed.