富士山頂の健常登山者にみられる 肺高血圧と低酸素血症の関係

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Remarkable incidence of Pulmonary Hypertension Relating to Hypoxemia in Healthy Mountaineers at the Top of Mt. Fuji

[Background] High altitude pulmonary edema is an important disorder causing possible fatality in mountain climbers occurring above 2300m altitude, however its pathophysiological detail has not been investigated well so far.

[Method] A prospective observational study was undertaken to evaluate cardiopulmonary performance in healthy mountaineers in hypobaric hypoxic environment at 3776m altitude. Echocardiography(Echo) was performed using GE Vivid-I at comfortable circumstance using Mt. Fuji weather station, and echo specialist undertook the whole recording. Hypoxemia w! as assessed with pulseoximeter in room air after 20 minutes rest. Clinical details were obtained by personal interview.

[Result] Out of interviewed 80 mountaineers Echo evaluation was undertaken in 28 volunteer subjects, of which results were compared with clinical variables. Subjects consisted of 18 male/ 10 female, aged 45+/-3 year, and their SpO2 level and PR were 80.5+/-4.5% and 97+/-14bpm respectively. Although LV systolic function was normal (EF67.9+/-6.8%) with some decrease of e-prime (9.7+/-2.4cm/s), pressure gradient across tricuspid valve and estimated systolic pulmonary arterial pressure(PAP) were elevated to 33.9+/-8.9mmHg and 43.9+/-8.9mmHg respectively, and 64% showed systolic PAP>40mmHg. Low SpO2 ≦ 80% (n=13) showed significantly higher systolic PAP than high SpO2>81% (n=15) (47.3+/-8.9mmHg vs 40.6+/-7.9mmHg; p=0.047), and increased incidence of systolic PAP>40mmHg(75% vs 47%; p=0.054).

[Conclusion] High altitude itself can cause pulmonary hypertension in relation to hypoxemia in healthy subjects, and further analysis of normobaric repeat echo study is awaited.