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THE ADAPTATION TO HIGH ALTITUDE AND THE PREVENTION OF HIGH ALTITUDE DISEASES IN ANTARCTICA: COMPARISION OF AIRPLANE APPROACH AND SNOW TRACTOR APPROACH

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Introduction: Dome F base of Japanese Antarctic Research Expedition (JARE) is at S77, E39, 3810m a.s.l.. The snow tractor trip approach from Syowa station (S69, E39, 29m a.s.l.) has been used. Though many medical indicators showed definitive changes with the altitude, severe high altitude diseases (HADs) have never occurred. From this experience we thought that this long tern approach might contribute to train the high altitude adaptation and to prevent from HADs. Since 2004, JARE adopted aircraft approach to Dome F airplane spot (3000m a.s.l.) and we were anxious about HADs. This study is undertaken to examine if the difference of approach influence on the morbidity of HADs.

Methods: We compare between the airplane team (APt) of 7 males in 2005 and the snow tractor teams (STt) of 7 males in 2000, 11 in 2002 and 8 in 2004. We estimate the high altitude impact with the morbidity, the mountain sickness score, Sat O2, blood pressure and heart rate.

Results: STt spent two or three weeks from sea level to Dome F and APt reached in one day. On the arrival at Dome F, Sat O2 of APt decreased to early 80th percentage with momentarily showing fewer than 80%. The level of STt retained in late 80th at the Dome F and never showed such a low level through the journey. The difference between two teams, though, disappeared within one or two weeks.No cases but one needed intensive care nor took symptoms disturbing working. One personnel of APt showed AV block with 3.5 seconds' arrest. He had no finding in the screening and there had been no symptom at the mountain training before departure. Though he had no symptoms and was able to work, we decided to take him back to Japan immediately. Then the close examination on heart function was performed to reveal the extinction of arrhythmia with no other particular dysfunctions.

Discussion: APt members win good adaptation to Antarctic high altitude station within one or two weeks. The three weeks' trip with tractors might be not necessary for adaptation. The careful observation is recommended at the initial stage of APt. The examinations and the mountain training can not completely exclude high altitude problems.