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Title: The feasibility of biofeedback in difficult-to-wean mechanically ventilated patients: A pilot study

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Body: Background. The development of psychological trauma in mechanical ventilated patients is currently recognized, especially for those difficult-to-wean patients requiring prolonged mechanical ventilation (MV). Purpose. The main purpose of this pilot study was to develop a heart rate variability (HRV) biofeedback for difficult-to-wean MV patients and test its feasibility. Methods. This study was conducted in a medical center in Taiwan. Ten of difficult-to-wean MV patients were recruited for testing the feasibility of a 4-session RSA biofeedback within 2 days. Psychophysiological indices (fear, dyspnea, anxiety, RSBI, and HRV) will be measured before and after the biofeedback intervention. Results. The results of psychological measures (fear, dyspnea, and anxiety) were significantly different after the biofeedback training ($t = 5.97, 4.31$, and 6.95; $p < .01$), but RSBI or HRV was not ($p = .098, .18$). All subjects reported that this biofeedback help them to self-controlled their breathing again and decreased their fear, dyspnea, and state anxiety. However, 6 out of 10 subjects reported that they did feel anxious to gaze at the computer screen and match their breathing with the pacer at the first two sessions, and had a difficulty to match their breathing with HRV due to the big variation of HRV at 3rd and 4th sessions. According ly, the initial HRV biofeedback protocol was modified. Discussion. The preliminary results indicated that HRV biofeedback could effectively decreased psychological distress in difficult-to-wean MV subjects. HRV biofeedback is resulted by adding an introduction session and a self-directed match their breathing with HRV session from initial program.