Effects of Domiciliary Nocturnal Ventilatory Support In Patients With Chronic Respiratory Failure

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Background: Domiciliary nocturnal ventilatory support (DNVS) is often used to treat patients with chronic respiratory failure, however, few randomized, controlled studies have investigated its efficacy.

Aims: The purpose of this study was to investigate the effects of a 6-month DNVS intervention on arterial blood gases, exercise capacity, and rate of hospital admissions of in patients with chronic respiratory failure.

Methods: Twenty-nine inpatients with chronic respiratory failure were randomly allocated to either the DNVS (n=13) or the control group (n=16). Among the patients in the DNVS group, 11 received ventilatory support from B bilevel positive airway pressure (BiPAP) (Respironics), and 2 received portable volume ventilatory support (PVL100) for 6 months. All patients were followed once a month for 6 months after discharge from the hospital. Arterial blood gases and exercise capacity were measured at discharge and 6 months after discharge. Exercise capacity was assessed by a standardized six-minute walking test (6MWT). The number of hospital admissions and length of stay for the 6-month period before enrollment and during the 6-month study period were determined from chart records.

Results: Subjects in the DNVS group showed significant reductions in PaCO₂, HCO₃⁻, and BE compared to the levels before intervention and also compared to the control group. The six-minute walking distance (6MWD) also increased significantly in the DNVS group, from 281.2 ± 104.6 m before intervention to 381.9 ± 87.4 m after intervention (p<0.001), and significant differences between the groups were found. Moreover, the DNVS group had significantly fewer admissions and days of stay in the hospital during the intervention period compared to before the 6-month intervention and to the control group.

Conclusions: Six-month DNVS intervention improved arterial blood gases, increased exercise capacity, and reduced the number of hospital admissions and length of stay in patients with chronic respiratory failure. Further studies to address the effects of DNVS on quality of life and health cost should be encouraged. (Thorac Med 2004; 19: 10-17)

Key words: chronic respiratory failure, domiciliary nocturnal ventilation support, 6-minute walking test, arterial blood gas