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Clinical Stabilization of a Patient with Amyotrophic Lateral Sclerosis Due to Comprehensive Management

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Abstract

Amyotrophic lateral sclerosis (ALS) is a progressive nervous system disease that affects nerve cells in the brain and spinal cord, resulting in paralysis, inevitably, death. We herein report a case of a 67-year-old woman diagnosed with Amyotrophic Lateral Sclerosis (ALS) for one year presented with type II respiratory failure who has been under comprehensive management and kept using Non-Invasive Ventilator (NIV) for more than four months in a stable condition. In this report, we try to discuss the multidisciplinary approach to optimize the functioning of the patients and to care the patients with ALS in order to improve their quality of life (QOL).

Keywords: Amyotrophic Lateral Sclerosis (ALS); Comprehensive Management; Type II respiratory failure; Non-Invasive Ventilator (NIV); Quality of life (QOL); Activities of Daily Living (ADL)

Introduction

Amyotrophic Lateral Sclerosis (ALS) is a progressive, ultimately fatal, neurodegenerative disease which affects both upper and lower motor neurons [1]. It can start with single limbs and eventually then spreads to other part of body, causing muscle weakness, atrophy and even paralysis [2]. Meanwhile, ALS can be accompanied with bulbar paralysis, bladder dysfunction, anxiety and depression [3]. Furthermore, when its progression comes to the later stage of the disease, paralysis of the respiratory muscles can lead to respiratory failure, which may be a lethal consequence for the patients [4]. Although ALS is relatively rare, the economic burden it brings to both society and individuals is enormous [5]. The progress of type II respiratory failure in these patients mostly occurs in the period of rapid eye movement (REM) sleep, the dyspnea often occurs at night in patients with ALS, which is more likely to carry a risk of death [6].

The patient in this report was given comprehensive treatment, the condition of the patient was stable and much better compared with her condition when admitted.

The study was approved by the local Institutional Review Board in West China Hospital of Sichuan University, Chengdu, China. Written informed consent was obtained from this patient according to the Declaration of Helsinki.

Case Report

A 67-year-old woman diagnosed with ALS for one year, who was also diagnosed with "Type II Respiratory Failure" "Osteoporosis" "Hypertension". The symptoms were mainly reflected in fine motor dysfunction, walking dysfunction, difficulty in standing without assistance and steady breathing.

A series of plans were developed for the patient that are listed as follows.

NIV

First of all, NIV is crucial to improve survival and QOL for the patient. Arterial blood gas of the patient had been monitored daily, and ventilator parameters were set according to parameters of blood gas and ECG monitoring.

Management of sputum

Firstly, sitting posture was a key focus in most time. Additionally, the patient was encouraged to stand with assistance when physical conditions permitted. Furthermore, regular sputum suction, aspiration under fiberoptic bronchoscopy when necessary, and expectoration with assistance (for instance, manipulation therapy on the back) were also conducted for the patient.

Physical therapy

The patient was assisted with moderate exercise for the maintenance of limb function. To improve her cardio-pulmonary function, the patient was instructed to do aerobic exercise and cough exercise.

Psychological management

Psychological education was arranged for the patient and relatives, and medical companions. On this basis, regular psychological assessment and communication were also an important part. What cannot be ignored is that, psychological counseling and anti-anxiety medication as an adjunctive therapy were taken.

On account of the characteristics of ALS, it is vital to prevent the complications, since it is life-threatening.

For the prevention of thrombosis, medical air mattress and intermittent pneumatic compression were chosen for the patient, low molecular weight heparin sodium injection was used as a therapy.

For urinary tract infection, the urinary catheter was replaced with a new one, and the bladder was flushed with physiological saline. Also, the patient was suggested to drink plenty of water to avoid urinary tract infection.

For osteoporosis

Alendronate sodium was used with vitamin D and calcium tablets as an essential anti-osteoporosis treatment.

After the comprehensive management detailed above, the household ventilator was encouraged to be used most of the time for the patient for adapting life back home, and intermittent training for ventilator weaning was designed to respond to the emergency moment in daily life. The patient was discharged in a stable condition after four months.

Discussion

Currently there is no cure for ALS. Averagely patients die within 3 to 5 years after diagnosis, most of whom passed away because of respiratory complications [7]. The main aims for patients with this disease are to minimize morbidity and to improve the QOL, which is a challenge, on account of the nonexistence of guidance, nor recommended therapy strategy. Therefore, comprehensive management is considered adequate in achieving the goal, of which respiratory function optimization is arguably the most important part. The purpose of respiratory function optimization that includes cardiopulmonary therapy and management of sputum is not to cure respiratory muscle failure, which is irreversible inpatient with ALS, but to maintain the current situation and reduce mortality. The respiratory function optimization is a comprehensive process, of which NIV is the most critical support, improving survival and quality of life [8]. Additionally, prevention and treatment of complications are essential to the patient. The Activities of Daily Living (ADL) of the patient is severely limited since their daily life highly depends on others [9], then support from family and companions is necessary to reduce anxiety of patients.

The management of ALS is best achieved by a multidisciplinary approach to care [10], while this neurodegenerative disease cannot be cured; thus support and multiple treatments, which includes prevention of complications, can be optimistically considered as the current suitable way to help those patients.

Conclusion

Treatments for ALS at present are limited, but stem-cell therapy and gene therapy are highly potential to release suffering [11]. With multiple treatments, we have firmly faith to better help patients with ASL.

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