Emergency power supply for at-home artificial respiration units

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Abstract

The measures regarding the emergency power supply of 23 patients that received at-home artificial respiration management were implemented. An external battery which could provide power for 5-6 hours in all cases was set up. The patients who used an electric wheelchair were equipped with a battery for respirators, and this battery was improved to allow it to be used in emergency situations. For the patients who did not use an electric wheelchair, the introduction of the lithium battery respirator was pushed forward. Because these cannot support blackouts of 24 hours or more, further improvement is needed.

Introduction

A great many devices depend on a power supply in modern medical care including artificially correlative breathing deeply. Power outages in Japan have decreased greatly since the Heisei era began, and 0.14 times of number of blackouts is reported with 16 minutes in the year per one in 2007. However, the blackouts increased during typhoon 19 with 0.51 times, 169 minutes in 1991. Also, in 2004, 0.33 times of blackouts increased under the influence of a typhoon with 88 minutes. Blackouts are an urgent problem for at-home artificial respiration users, and measures to cope with them are necessary. Therefore, at the Tokushima National Hospital pediatrics department, measures were introduced to provide emergency power supplies for at-home artificial respiration patients.

Materials & Methods

At-home artificial respiration was performed at the Tokushima National Hospital pediatric department for the first time in 1996 [1,2]. Sixty-six home artificial respiration units had been introduced by March, 2011. Among the at-home artificial respiration cases, 23 patients (22 muscular dystrophy patients and one spinal muscular atrophy patient) who received management every month in March, 2011 were enrolled. As for the artificial respiration enforcement, in seven cases it was performed while sleeping, three cases were while sleeping and awake, and 13 cases were all day long. As for the respirators used, Vivo40 was 6 cases; LegendAir, 4 cases; LTV950-1150, 8 cases; Trilogy, 4 cases; Achieva plus, 1 case.

Results

We choose a storehouse type in the battery as a respiratory condition for at-home artificial respiration. Furthermore, one outside battery was prepared. Fourteen patients who were electric wheelchair users who were not a simple type among subjects. One the pitcher and the catcher skillful with breathing were added to an electric

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wheelchair in those cases, and it was set up. Remodeling was added so that conversion to emergency breathing was possible using the battery for powering the electric wheelchair. As a result, support with the emergency power supply was possible for 24 hours. Inverter skillful with artificial respiration using a cigar writer connection for privately-owned cars has become available. To date this inverter has been introduced in three cases.

Discussion

In a sudden blackout, the caregiver would be confused. Therefore the initial set up should be easily done. The battery should ideally be built-in on the respirators. The risk that the respirator would stop thereby decreases. First, an external battery was prepared. Furthermore, measures to enable the battery to be used to power the wheelchair were made. These the pitcher and the catcher can operate a respirator for 5-6 hours.
However, support only with a battery is difficult when a blackout is prolonged by a large-scale disaster. Therefore, there must be consideration of methods of recharging.
When there is the fuel for the car, an inverter which can be connected to the cigar lighter of a privately-owned car can be used.
A recharge of the battery for emergency can use this. Health insurance was indicated for at-home artificial respiration from 1990. However, emergency power supply is not considered institutionally. The support at the medical institution level is necessary to perform home mechanical ventilation more safely.

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