Factors Relating Successful Ventilator Weaning in Cervical Spinal-Injured Patients

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Introduction

Respiratory complications are the catastrophic problem in Spinal Cord Injured (SCI) patients, leading to death. In cases of Cervical SCI, they usually end up with using the mechanical ventilator if the patients are not able to control their respiratory muscles. The weaning program should be performed as early as possible to prevent the difficulty for weaning-off.

Objectives

- Explore predicting factors that affect success in SCI ventilator weaning.
- Explore the outcome of weaning protocol

Materials & methods

- Retrospective study design by using hospital database from 2012-2015
- Demographic data
- 12 predicting factors:

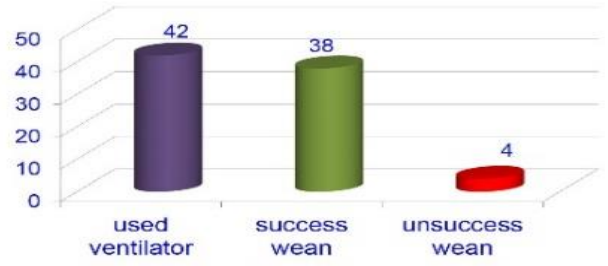
Factors	
Chest X-rays	Vital signs
Hemoglobin, Hematocrit	Electrolytes
Smoking	Lung infection
Level of consciousness	Nutritional status
Co-morbidities	Psychology
Abdominal problems	Chest trauma

- Spinal Cord-Injured patients with mechanical ventilator
- Admitted in Spinal Cord Injury Critical Care Unit from January 2012 to December 2015

Statistics

- Descriptive analysis was used to analyze the outcome of weaning protocol
- Univariate analysis was used to identify the factors related to weaning success
- Multivariate analysis was used to investigate the independent factors providing significant association with successful weaning

Results: 1



Results: 2

Variable	Success	Failure
Gender		
Male	35	4
Female	2	1
Age		
< 60 years	28	4
> 60 years	9	1

Results: 3

Level of injury		
C1	2	0
C2	2	2
C3	5	0
C4	19	1
C5	4	1
C6	3	1
C7	2	0

Results: 4

Variable	Success	Failure
ASIA Score		
A	15	4
B	8	0
C	5	0
D	9	1

Results: 5

Variable	Success	Failure
Comorbidity	17	3
Lung diseases	13	2
Chest trauma	4	0

Results: 6

- Mean of weaning time = 15.31 days (range : 3 -52 days)
- 12 cases (38.10%) weaning time less than 10 days
- 26 cases (61.90%) weaning time more than 10 days
- 22 cases (52.38%) must have respiratory muscle exercise (VMT) before starting the weaning program
- C 5 + ASIA score group A, B, C used a time to wean 10 days up
- Early weaning can decrease weaning time

Results: 7

Factors that that affect success in SCI ventilator weaning.

Factors	OR	95% CI
Normal level of consciousness	11.1	3.4 - 59.55
Normal chest-film	5.8	1.2 – 59.4
Normal vital sign	25.5	1.42 – 137.5
Normal hemoglobin/hematocrit	19.8	1.17 – 106.8

Discussion & Conclusion

- Successful rate for weaning = 90.47% (38/42 patients)
- Chest film was one of the factors that health care providers must pay attention to in SCI patients. Good chest film can found in SCI patients who have continuous physical therapy.
- Four predicting factors are the keys of readiness for weaning that health care providers must concern before starting the ventilator weaning.