



Factors Related to Health Outcome of Unplanned Extubation in a Nationwide Incident Reporting System

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Objectives:

To examine the risk factors of poor health outcome after unplanned extubation (UE) in a nationwide incident reporting system.

Methods:

An incident reporting system on unplanned extubation was established in Taiwan by the Taiwan Joint Commission on Hospital Accreditation (TJCHA) in 2005 as part of its goal to establish and create a patient safety environment in all health care setting in Taiwan. This anonymous voluntary reporting system encouraged all health care personals to report all incidence of UE in their work setting. Data was collected from January 2005 to December 2009. Outcome was defined by the Severity Assessment Code (SAC). Multivariate logistic regression model was used to predict the health outcome of the incidents using SAS 9.2.

Results:

There were 3,645 incident reports of UE collected in the system. As shown in Tab. 1, factors related to poor health outcome are a caretaker present at the time of incident (OR: 1.57), accidental extubation (OR: 1.68), subsequent reintubation (OR: 3.61), and consciousness impairment (OR: 1.43). If the incident happened in the surgical subunits (OR: 0.39) or in special care units (OR: 0.46) the outcome are more favourable. Using variables selected from univariate analysis and removing variable reintubation, multivariable analysis results were shown in Tab. 2. Presence of a caregiver and poor consciousness level showed statistical significance (p=0.02, p=0.04 respectively). ICU patients and surgical patients have better outcome (p=0.01, p=0.01). It is important to note that incidents received subsequent reintubation had twice as higher risk to have a poor health outcome compared to those who were not reintubated (OR: 3.24).

Conclusions:

UE is considered as an adverse event in patient care and is a direct reflection of patient safety in a health care setting. Many of these incidences increase patients' mortality and morbidity thus resulting in increasing cost in patient care.

1. Subsequent reintubation is an important risk factor in the determination of outcome in UE and doubles the risk of poor outcome.
2. A caretaker present during the incident increased a 43% chance of poor outcome.
3. Incidents that happened in the surgical subunits had a 54% lesser chance of poorer health outcome.

Table 1. Factors related to poor health outcome after unplanned extubation

Variable	Estimate	OR	95%CI
Age (>19 years old)	0.37	1.45	0.59 ~ 3.59
Sex (Male)	-0.26	0.81	0.60 ~ 1.08
Sedation Used	0.18	1.20	0.83 ~ 1.73
Physical Restraint Used	0.21	1.23	0.91 ~ 1.66
Caregiver Present*	0.45	1.57	1.17 ~ 2.1
Accidental Extubation*	0.52	1.68	1.21 ~ 2.34
Reintubation*	1.28	3.61	2.55 ~ 5.11
Physical Activity	0.1	1.1	0.79 ~ 1.54
Consciousness clear*			
Anxious/Agitated	0.36	1.43	1.05 ~ 1.95
Lethargic/Comatose	0.52	1.69	1.04 ~ 2.73
Department Medical*			
Surgical	-0.95	0.39	0.24 ~ 0.63
Others	-0.74	0.93	0.59 ~ 1.46
Setting Emergency Department*			
ICU	-0.77	0.46	0.28~ 0.77
Others	-0.25	0.78	0.45 ~ 1.37

* Statistical significance p<=0.05

Table 2. Multivariable analysis: determinants associated with poor outcome of UE

Variable	Estimate	OR	95%CI
Caregiver Present*	0.40	1.49	1.07 ~ 2.09
Anxious/Agitated*	0.36	1.43	1.02 ~ 2.02
Department Surgical*	-0.70	0.5	0.30~0.81
Setting ICU*	-0.76	0.47	0.28~ 0.86

*Stastical significance p<=0.05

