

Indicators of Adverse Events in the Intensive Care Unit A French Multicentric Study

A. TABAH, L.SOUFIR, M. GARROUSTE-ORGEAS, A. VESIN, B. SOUWEINE, E. AZOULAY, J. CARLET,
JF. TIMSIT

From the French Outcomerea Study Group <http://www.outcomerea.org>
alexis@tabah.com

BRIEF OUTLINE OF CONTEXT:

Selection by a panel of experts of the most representative adverse events (AE) in the intensive care unit (ICU) setting followed with a multicentre study to determine their incidence, impact on outcome and preventability.

BRIEF OUTLINE OF PROBLEM:

In ICUs, as the workload is higher, the risk for AE is thought to be important. The absence of knowledge on the incidence and consensus on which AE should be prevented makes it difficult to conduct homogeneous and comparable clinical trials or initiatives to improve safety in the ICU.

ASSESSMENT OF PROBLEM AND ANALYSIS OF ITS CAUSES:

A panel of 60 experts used a Delphi technique to select 14 AE with these characteristics: common, source of morbidity, reproducible and easy to collect.

STRATEGY FOR CHANGE:

One week multicentre cross-sectional study carried out in a sample of 75 ICUs in France. In each centre a senior physician was in charge of data collection and was provided with paper and electronic files, guidance, and a 24 hour helpdesk.

We collected the usual data to describe ICU patients and for each one of the 14 AE events was provided a list of possible clinical and therapeutic consequences. The reporting had to include the severity and preventability for each AE both reported using a 6 grades scale. The frequency of an event was defined by the ratio between the number of indicators collected for 1000 days of exposure (after stratification on the centre, the number of days spent in the week of study and exposure to the specific risk).

MEASUREMENT OF IMPROVEMENT:

We included 1369 patients (age:61.2 +/- 17.8; male sex: 65.5%; 71.2% medical admissions; SAPS II 45.4 +/- 19.8) totalising 9639 days of risk exposure. The characteristics for the reported AE are detailed in the table below.

	Frequency	Severity (%)	Preventability (%)
Insulin Delivery Error	188.5	6.7	77.3
Tracheal Cuff Overinflation	81.7	1.1	89
Half-Sitting position not respected with MV & EF	37.5	14.9	73.6
Vasopressor delivery Error	20.9	31	96.6
Error in prescribing Anticoagulant therapy	8.2	27.8	100
Self Extubation	6.5	71.4	85.7
Anticoagulant delivery error	5.3	26.1	95.7
Accidental extubation	4.3	57.1	85.7
Accidental Catheter removal	2.6	55.6	44.4
Drug delivery error	2.4	4.3	95.7
Iatrogenic Pneumothorax	2	71.4	14.3

After adjustment on severity and duration of exposure to the risk (logistic generalized model), the occurrence of more than 5 iatrogenic events significantly increased the risk of death (OR:3.28 [1.21 – 8.88] p=0.02).

EFFECTS OF CHANGES:

We were able to determine the incidence, severity and preventability for the most descriptive events of actual safety problems in French ICUs. This knowledge provides the basis to design quality improvement programs.

LESSONS LEARNT:

Adverse events are common in the ICU setting (cumulative incidence of 212 events for 1000 days of risk exposure) and source of morbidity and mortality. There are wide variations in the frequency, severity and preventability between the AE.

We selected the errors in insulin delivery, in anticoagulant prescription and delivery and accidental extubation or catheter removal as having the best combination of frequency, severity and preventability. The last phase of our study, performed in 2007 is designed as a multifaceted program to increase the safety in the ICU by reducing the incidence and morbidity related to these 5 AE.

MESSAGE FOR OTHERS:

The design of an action to enhance safety in the ICU needs to select AE with those characteristics: frequency doesn't need to be high but shouldn't be too rare, and most importantly reproducibility, severity and preventability need to be important.