Predicting Risk for Opioid-Induced Sedation and Respiratory Depression in Hospitalized Patients

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Background

Pain assessment and management is a fundamental part of nursing care. Opioids are one of the interventions utilized to manage pain within the hospital setting and have a known adverse effect called Opioid-Induced Sedation and Respiratory Depression (OSRD).

Identification of the problem: There is a lack of consensus regarding the risk factors that predict OSRD. Therefore, this study served as a first step in the creation of a risk screen tool for OSRD.

Purpose of the Study: The purpose of this quantitative study was to create a prediction model with the known risk factors, present on admission, for OSRD to determine how well they predict OSRD.

Methods

The combination of factors that most accurately predict the risk of OSRD in patients on admission to an acute care healthcare institution was determined through a retrospective case control analysis. Risk factors present on admission of a case group who had succumbed to OSRD after an opioid administration were compared to a control group who did not.

A binary logistic regression analysis determined how well age, body mass index, obstructive sleep apnea, pulmonary disease, respiratory disease, renal failure, and no opioid use (i.e., being opioid naïve) predicted OSRD.

Results

Group 1 (Case)

- 136 total surgical patient records from various procedure types, including cardiac catheter procedure, general surgical procedures, gynecological procedures, neurosurgical procedures, orthopedic procedures, urological procedures and vascular procedures.
- 64 medical patient records from a variety of admitting diagnoses categorized as cardiac or respiratory diagnosis, gastrointestinal diagnosis, infection diagnosis, neurological diagnosis, and oncological diagnosis.
- Female records (72%) over Male records (28%).

Group 2 (Control)

- The demographics for Group 2 were matched to the Group 1 sample; the sample was randomly extracted based on the first surgical or medical procedure and gender, male or female, that corresponded from the report provided by the information technology department.

Descriptive Results

Factor	Group 1 n	Group 2 n
Total n	100	100
Female Gender	72	72
Average Body Mass Index	28.3	28.9
Average Age	67.5	66
Obstructed Sleep Apnea	30	24
Pulmonary Disease	37	27
Cardiac Disease	84	71
Renal Failure	38	25
Diabetes Mellitus	45	38
Opioid Naïve	81	79

Results

The presence of pulmonary disease, renal disease, cardiac disease, diabetes, and being opioid naïve most accurately predicted OSRD in final model.

Overall model was statistically significant
X^2 (8) = 34.714, p = .000.

Factor analysis

Not Significant
BMI p = .899, *Exp (B)* = .997
Age p = .935, *Exp (B)* = 1.001
OSA p = .763, *Exp (B)* = 1.146

Not Significant with increased odds
Cardiac disease p = .207, *Exp (B)* =1.675
Diabetes p = .272, *Exp (B)* = 1.485
Opioid naïve p = .202, *Exp (B)* 1.653

Statistically Significant
Pulmonary disease p = .001, *Exp (B)* =3.706
Renal disease p = .004, *Exp (B)* = 3.084

Discussion & Conclusions

The advantage of only examining risk factors present on admission substantiates the purpose of this study and narrowed the focus from all the risk factors in the literature throughout the continuum of care. This allowed for a magnified view of factors to be screened on admission in a simplified tool.