Author’s response to reviews

Title: Postoperative delirium assessed by post anesthesia care unit staff utilizing the Nursing Delirium Screening Scale: a prospective observational study of 1000 patients in a single Swiss institution

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Version: 1 Date: 28 Nov 2015

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BANE-D-15-00015

The incidence of postoperative delirium in the recovery room: a prospective observational study of 1000 patients in a single Swiss institution assessed by recovery room staff utilizing the Nursing Delirium Scale Andreas Winter; Marc P Steurer; Alexander Dullenkopf BMC Anesthesiology

A) Comments to Reviewer 3

The title of this article suggests this is a report of incidence of delirium in a PACU, however the conclusion and methodology do not explain the findings in a logical way, and there are many missing details. Addressing the article from start to finish, here are the questions and concerns supporting my recommendation:

According to the suggestion of the reviewer, title and subtitle of the manuscript were rephrased. Please note that also the term Nursing Delirium Screening Scale is now used instead of Nursing Delirium Scale throughout the manuscript.

Background: The writing is vague and reported facts are not well supported. Rather than cover this section with older references from smaller journals, there are a few notable comprehensive journal articles on delirium you may consult for specific information:


These articles give specific tests and measures to describe the long term functional decline, the independent association of mortality, the cognitive and psychological sequelae resulting from delirium. These are missing from the current draft of this submission.

Information from the recommended articles regarding specific tests, risk factors, and delirium affecting longer-term outcome is now included in the Background as well as in the Discussion section of our manuscript and the mentioned articles are therefore added to the reference list. A few of the criticized references were removed instead (former references 2, 4, 5, 9, 10, 12, 15, 16, 19, 21). These articles are all mainly dealing with delirium (and its sequelae) in intensive care patients. This field is much better covered than delirium in the anesthesia recovery room, as is stated in our manuscript and was one of the objectives for performing this study.

Regarding the choice of delirium detection tool, the rationale appears to be that it is a simple to utilize tool. However there is no mention of the development of this tool for use in the PACU, or how it compared to the CAM as cited in the reference, nothing about how valid or reliable it is or the level of specificity and sensitivity compared to other measurement tools or as a function of the RN training provided for use in the submission. Of note, a recent study assessing delirium prevalence in a PACU setting chose the CAM rather than the NU-DESC:


The rationale for choosing the NU-DESC is important to state also in light of a previous journal article comparing several delirium screening tools in ICU populations:


The mentioned articles are used in the revised manuscript to further characterize the NU-DESC test and to explain our rationale for using this test in our study.

Please note, that the article by Card et al. was only published in BJA in September 2015. It resulted in a similar rate of patients in delirium at the time point of discharge from the PACU, but was performed much more under study conditions than our everyday attempt.
Methods:

The timing of the delirium screening is vague and random - when the patients were ready for transfer out... a time interval from admission to the PACU in minutes would be more objective and reproducible. A description of enrollment procedures, consenting, and exclusion criteria would be helpful to understanding the findings. How many RNs were trained to perform the NU-DESC and how did you establish their proficiency? Rather than describing the demographics of the hospital and the PACU, it would be more informative to know more about the sedating agents, pain medications, and some measure of comorbidity or illness severity.

The timing (and the fact of the single assessment time point) is now included in the Discussion in a limitations paragraph. Enrollment, consenting, and exclusion criteria are described in more detail in the Methods section, as is information about the RNs.

There is now also a paragraph about our standard anesthetic (fasting, premedication, induction, maintenance, pain medication) to be found. Unfortunately we are not able to provide more detailed information about comorbidity or illness severity in addition to the reported low ASA classifications of our patients and the fact that there were no cardiac surgery patients and no patients admitted to an ICU.

Discussion:

The statement in line 190: generally it has been shown that nurses collecting data in the course of routine care have significant problems using even validated screening tools such as the CAM-ICU is not well supported by the given reference. Was the intention to say the CAM-ICU itself is challenging or just adding any additional screening tool to an RN day and achieving adoption is difficult?

The mentioned statement is deleted in the revised manuscript.

It appears the objective of the paragraph in lines 187 through 202 is to support the choice of delirium assessment tool - the NU-DESC over the CAM-ICU. However the logic of this is not clear and the rationale for which tool was chosen for the study is appropriate for the Background or methods section.

In fact, the objective of the paragraph mentioned is to discuss the possibility that RNs might classify less patients as showing signs of psychomotor retardation than e.g. psychiatrists might do, because RNs are more used to patients being sleepy after anesthetics. This could contribute to a lower incidence of delirium when assessed by RNs. We feel this is supported by the findings of Haenggi et al, highlighting the importance of taking into account the sedation level of patients. The paragraph is rephrased to make this point more clear.

It is difficult to determine what the objective of this prospective observational study was - to assess the reliability of the NU-DESC or to understand something about the incidence of delirium.
In fact, the objective was to find out, if NU-DESC testing would be feasible in our setting and simply to get an idea for how many patients in our PACU delirium might be a topic to follow-up. We believe this is reported more comprehensible now in the limitation paragraph in the Discussion section.
The aims of the study are now also stated explicitly at the end of the Background section.

Conclusions:

The 4% rate of PACU delirium found in this study at the time of patient discharge from the PACU is declared low, yet is within keeping with the findings of a PACU delirium survey utilizing the CAM ICU conducted by Card et al. entitled Emergence from General Anesthesia and Evolution of Delirium Signs in the Post-Anesthesia Care Unit, The Card study has the additional feature of a multivariable logistic regression assessing for potential risk factors for PACU delirium. Making PACU delirium screening relevant to clinicians in the future will involve examining if PACU delirium has an actual association with adverse outcomes, the question is, does PACU delirium represent a predictive indicator of the patients ability to recover fully? Without addressing this concept in the study design or in a thorough literature review, the paper lacks a valuable take away for the clinician and it only represents a feasibility study of RN capability to perform the NU-DESC.

The agreement of the incidence found in our study with that of the Card study is mentioned in the revised manuscript, as is the reviewer’s excellent statement about the relevance of delirium monitoring.
We are also confident to have improved our addressing the relevant literature considerably.

B) Comments to Reviewer 4

The question posed by the authors is not well defined. It appears (last paragraph of the background) that the the aim of the study is to evaluate the feasibility of comprehensive testing for delirium in post operative care unit (PACU), using NU-DESC by PACU staff, before implementation as a first step in a patient care improvement strategy. Such a question seems interesting, since few studies have addressed this question in a setting such as the one described in this study (non tertiary hospital, non cardiac surgery). It would have been interesting to have some insight in the acceptance of the testing, by the PACU staff, or the additional workload induced by the testing.

Information regarding this topic is now included in the Discussion section.

The results are well presented and show a low number of patients tested positive for delirium, as compared to other published data. This result is well discussed.
However, the speculation on the potential role of some drug used in the perioperative (line 218-232) seems inappropriate: there is no reporting of the other drugs used in these patients, which
are known to play a role in pharmacologically induced delirium (ketamin ? antiemetic treatment ? corticoïds ....).

This highly speculative paragraph is rephrased.

The negative results regarding the comparison between the patients with delirium and the patients without delirium is not discussed, and should be (small numbers).

These results are now shortly discussed in the Discussion section (paragraph about limitations).

In addition, for a better understanding, some writing improvement would be welcome:
« Formal presence of delirium » is defined only at line 102 (A total of ≥ 2 points indicated the formal presence of a delirium), in the methods section, although used before (line 76, 90 ...). However, the term delirium is also used, to refer to patients in whom « formal presence of delirium » had been detected. It would be more adequate to refer to « delirium » in all cases.

The term “delirium” is now used in all cases instead of “formal presence of delirium”.

The « post anesthesia care unit » (PACU) is also referred to as « post operative recovery room ». It would be better to choose between one of the two expressionS, and keep always the same for the whole paper.

According to the suggestion of the Reviewer we chose post anesthesia care unit, mainly for better accordance to the abbreviation PACU.

The first sentence of the abstract is quite complicated (« has become a better studied, but only partially understood yet still significantly underestimated problem »), and is found strictly identical as the first sentence of the background section (line 55-56).

Indeed, complicated – but rephrased now.

Regarding the references:
Some references have been inadequately quoted:

Line 66 the reference quoted does not demonstrate the sentence Line 70 reference 15 refers to a review article from more than 20 years ago : it is inadequate to quote such a paper to argue that « very little is known about » …

We agree and did a major revision of the references.

Line 72 reference 18, 320 and 21 describe strategies to early recognise a state of confusion, but do not indicate that such strategies lead to better treatment options All the references DO exist, but some of them have been wrongly quoted (not validated in the reference checking).

The misleading statement about former reference 18 is corrected and the former reference 21 deleted. All references have been checked for submission of the revised manuscript.