Reviewer’s report

Title: Type D personality is a predictor of prolonged acute brain dysfunction (delirium/coma) after cardiovascular surgery

Version: 2 Date: 15 Jan 2019

Reviewer: Johan Denollet

Reviewer's report:

Let me please make clear from the outset that I like this paper very much. The approach taken in this study is original, the study represents a considerable amount of a work, and most important, the findings reported in this paper are novel and immediately relevant for clinical research and practice. The paper is generally well written, and I very much liked reading the paper.

That said, I have a number of comments, and the paper needs some re-working. Therefore, I would like to urge the authors to take up the challenge to make these revisions, which, from my point of view, would further strengthen their paper.

Title.

I would like to suggest the authors to adapt a little bit as follows:

"Type D personality is a predictor of prolonged acute brain dysfunction (delirium/coma) after cardiovascular surgery."

It is more straightforward to refer directly to the main outcome under investigation, which is brain dysfunction. Reduced delirium/coma-free days is an operational definition of this outcome measure; therefore, I would place it between brackets after brain dysfunction.

Since the operational procedures in this study also include vascular surgery, it is better to refer to cardiovascular surgery (instead of cardiac surgery).

Dependent variable in analyses.

In the analyses, Tables and text, please use acute brain dysfunction as the dependent variable. Since the authors would like to investigate the association between Type D personality and brain dysfunction, it would seem more logical to me to use "Prolonged delirium/coma days" as a measure, and not the reverse, "Delirium/coma free days" (as now is the case). This would not change anything in terms of findings, but sure would make the interpretation of findings much more simple and straightforward.
For example, in Table 2 it is now reported that Type D personality is associated with an OR=0.3, meaning that Type D is associated with a 70% decreased odds of days without brain dysfunction. In other word, you need to read this as a decreased odds of an (desirable) event that is not occurring. If the authors would reverse the dependent variable from "delirium/coma free days" into "delirium/coma days", the OR and 95% CI of Type D personality will become greater than 1, indicating that Type D personality is associated with an increased odds of brain dysfunction as an undesirable event.

Sum score of negative affectivity and social inhibition is not valid.

The authors refer to Horwood and Anglim (2017, Ref #38) and Stevenson & Williams (2013, Ref #37) to indicate that they also used the sum of negative affectivity and social inhibition (NA+SA) as a continuous measure of Type D personality. As pointed out correctly by the authors, Horwood and Anglim (2017, Ref #38) did indeed use the sum of the negative affectivity and social inhibition subscales as a continuous measure of Type D personality, but they should not have done so. Negative affectivity and social inhibition refer to two different personality traits, and should not be added together as a total score. Therefore, the findings on the total Type D score reported in Table 3 are not valid, and Table 3 should be deleted in the manuscript. Moreover, Table 3 does not add anything above and beyond the findings reported in Table 2.

Hence, the sentence in the Results section on p.14 stating that: "Assuming type D personality is a continuous value, increasing total scores of Type D personality (Total score of NA + SI) were also associated with significantly decreased DCFDs (OR = 0.9, 95% CI = 0.9-0.9) (Table 3)" should also be deleted. However, the sub-analyses using the continuous scores of negative affectivity and social inhibition as separate, independent components of Type D personality are certainly meaningful, and may be included in the manuscript (instead of being reported in a Supplemental File, as now is the case).

Finally, please notice that Stevenson and Williams (2013, Ref #37) did not calculate the sum score of NA and SI but rather used the interaction term of NA and SI (NA X SI) as a continuous measure of Type D personality.

Use of the terms "Non-Type D patients" and "Non-Type D personality".

In the Type D dichotomy, a distinction is made between "Type D patients" (presence of Type D personality) and "non-Type D patients" (absence of Type D personality).

Please avoid using the term "normal patients" in comparisons with Type D patients (because this seems to imply that Type D patients are "abnormal") but rather use the term "non-Type D patients".
By analogy, the Type D literature refers to Type D personality and Non-Type D personality (as the authors also have correctly noted in Table 1).

Please notice that Type D is always written with a capital "T", also in the text.

Abstract.

In the abstract, "type D (distress)" should be changed to "Type D (distressed)" personality.

"A total of 142 patients … and the total prevalence of delirium was found to be 33%, of which 26% of the patients were Type D". I find this sentence a bit confusing; I suppose you want to indicate that 26% of all patients had a Type D personality, but now it looks as if 26% of the patients with delirium also had Type D.

I would also make clear in the Abstract that Type D personality remained associated with prolonged brain dysfunction, even after adjustment for depressive symptoms.

Figure 2.

I would like to suggest to change the title of figure 2 as follows:

"Distribution of normal, delirium, and coma days, stratified by Type D personality.

Please consider the upper panel (Total population) from this figure, because it distracts from the main findings of your study on personality differences.

Please use the labels "Non-Type D patients" and "Type D patients" (instead of "Normal patients" and "Type D personality patients").

Figure 3.

Label above the red arrow pointing to the left: please use "Prolonged brain dysfunction" as a label (and not "Prolong delirium/coma days"; in any case, prolong should be prolonged).

In Figure 3, please use the term "Non-Type D personality" (instead of "Not Type D personality).

It is not clear to me what the label "Depressive symptom" refers to in this figure. Is this the OR of brain dysfunction associated with depressive symptoms in the study? (because in that case, "Depressive symptoms" should be noted below Non-Type D personality, instead of "Total population")
Discussion.

I agree with the authors that inflammation and endothelial dysfunction is a potential biological pathway that may help to explain the link between Type D and acute brain dysfunction following surgery (p. 19). There is a recent publication that reports on a clear association of Type D personality with endothelial dysfunction - the authors may wish to refer to this publication (Denollet J, van Felius RA, Lodder P, et al., Predictive value of Type D personality for impaired endothelial function in patients with coronary artery disease. Int J Cardiol. 2018;259:205-210).

References.

Please double-check the accuracy of the references in the reference list.

For example, Ref. # 15 does not report the correct title of the article, does not include journal title, volume number or pages, and was not published in 1997. The correct title and reference is: "Usefulness of Type D personality in predicting five-year cardiac events above and beyond concurrent symptoms of stress in patients with coronary heart disease. Am J Cardiol. 2006; 97(7):970-973."

As another example, References #17, #33, #45, and #46 do not include Journal name, volume number or pages. Please correct, and make sure that all references are accurate.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

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Are the conclusions drawn adequately supported by the data shown?
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