

LETTER

How natural light affects critically ill patients with subarachnoid hemorrhage

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Wunsch and colleagues analyzed the effect of window rooms on critically ill patients admitted to the ICU with subarachnoid hemorrhage, and concluded that the presence of a window in an ICU room did not improve their outcomes [1]. We commend the attempt to associate natural light with improved outcomes for hospitalized patients, but we have some concern as regards the data analysis and interpretation.

The Hunt–Hess grade has been well accepted to correlate with subarachnoid hemorrhage mortality [2,3]. Although the authors performed subgroup analysis in patients with a Hunt–Hess score of I to III during the ICU stay, further stratified analyses according to the Hunt–Hess score still are needed. This analysis may exclude disease severity as a confounding factor, especially when natural light does not affect the outcomes of critically ill patients as markedly as does disease severity. We would therefore like to ask whether there is a difference regarding disease outcomes in subgroups of

patients with different Hunt–Hess scores. We have noted that patients with both aneurysmal and spontaneous nonaneurysmal subarachnoid hemorrhage were included. Since the Hunt–Hess score was initially designed for cerebral aneurysms [4], we are also interested to know whether the authors performed subgroup analyses based on aneurysmal and nonaneurysmal etiologies.

The potential importance of natural light for quality care of critically ill patients should be emphasized, especially in terms of minimizing circadian rhythm disruptions [5]. Moreover, as recommended by the Society of Critical Care Medicine, light in the ICU should be designed to be adjustable [5]. This factor seems to be crucial for studies aiming to explore the role of natural light in improving the outcomes of critically ill patients. Otherwise the actual effects of natural light might be significantly weakened by the 24-hour glaring artificial light in an ICU.

Authors' response

Hannah Wunsch, Hayley Gershengorn, Stephan A Mayer and Jan Claassen

We appreciate the thoughtful comments and queries of Zhang and Wu. We agree that there are many potential analyses that might result in identification of benefit (or harm) in specific subgroups of patients. However, we limited our analyses to the subgroups we had chosen *a priori* due to the size of the cohort [1]. In particular, we chose not to stratify patients into smaller subgroups, such as individual Hunt–Hess scores, because the resulting groups would then be inadequately powered to identify reasonable differences in outcomes. We appreciate the suggestion regarding stratification by

aneurysmal and nonaneurysmal etiology, and in *post hoc* analyses we did not find any difference in our primary outcomes of the modified Rankin Scale at hospital discharge, at 3 months and at 1 year.

The question of the effect of light on critically ill patients is complex. We are clearly only at the beginning of exploratory analyses both to identify appropriate patient groups for study and to understand the mechanisms of action of light in the human body during critical illness. Current analyses are limited by available data and we hope that future studies may allow for prospective design, including randomized trials, to examine this important issue.

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Abbreviations

ICU, intensive care unit.

Competing interests

The authors declare that they have no competing interests.

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