Is the Nociception Coma Scale-Revised a useful clinical tool for managing pain in patients with disorders of consciousness?

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Objectives. The Nociception Coma Scale-Revised (NCS-R) has recently been developed and validated for assessing nociception in patients with disorders of consciousness (DOC). However, this scale was validated using noxious experimental stimuli and has not yet been tested in a clinical setting. In this study, our objective was to assess the clinical interest of the NCS-R in the pain management of patients with DOC.

Methods. Thirty four patients with documented painful areas (e.g., due to fractures, decubitus ulcers or spasticity) were assessed during nursing cares before and after the administration of an analgesic treatment of the best analgesic treatment according to each patient’s clinical status. In addition to the NCS-R, the Glasgow Coma Scale (GCS) was used before and during treatment in order to observe fluctuations in consciousness. Eleven patients were in a vegetative state or unresponsive wakefulness syndrome (VS/UWS; 7 males; median age: 63y; range: 22-90y; 0 to 108 days post-injury (median: 11 days); 8 non traumatic) and 23 were in a minimally conscious state (MCS; 16 males; median age: 61y, range: 21-93y; 0 to 34 days post-injury (median: 12 days), 14 non traumatic). Eighteen of them had no analgesic treatment prior to the assessment whereas the analgesic treatment has been revised in the other 15 patients.

Results: We performed an ANOVA with repeated measures on the treatment (before vs. during) and on the scales (NCS-R vs. GCS) and with the level of consciousness (VS/UWS vs. MCS) and the etiology (traumatic vs. non-traumatic) as covariates. A main effect of the treatment (F=16.7; p<.0001) as well as an interaction between the treatment and the scales (F=21.7; p<0.0001) have been found. We found no significant difference according to the level of consciousness or the etiology. Post-hoc analyses using Wilcoxon signed-rank tests revealed that NCS-R total scores were statistically lower during treatment when compared to the scores obtained before treatment (p<.0001). On the contrary, we found no difference between the GCS total scores obtained before vs. during treatment. Using Wilcoxon signed-rank tests, we found that the motor subscores (p corr =.006) and the facial expression subscores (p corr <.001) were lower during treatment than before treatment. Verbal subscores did not differ significantly before vs. during treatment (p corr = .08).

Conclusion: According to our results, the NCS-R total scores but not the GCS total scores decreased during analgesic treatment in severely brain-injured patients with documented painful areas. Our results suggest that the NCS-R is an interesting clinical tool in pain management when a balance is needed between reduced nociception/pain and preserved level of consciousness in patients with DOC.
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INTRODUCTION

OBJECTIVES: Assessing pain perception in patients with disorders of consciousness (DOC) is a real challenge for clinicians as, by definition, this population cannot express their own feelings. The Nociception Coma Scale-Revised (NCS-R2,3, see Table) has recently been developed and validated for assessing nociception in those patients. However, this scale was validated using noxious experimental stimuli and has not yet been tested in a clinical setting. In this study, our objective was to assess the clinical interest of the NCS-R for the pain management in patients with DOC.

METHODS

PATIENTS: 36 patients with documented painful areas (e.g., due to fractures, decubitus ulcers or spasticity) were included in the study. Eleven patients were in a vegetative state or unresponsive wakefulness syndrome (VS/UWS; 7 males; age range: 22-90y; 0 to 108 days post-injury); 8 non-traumatic and 25 were in a minimally conscious state (MCS; 18 males; age range: 21-93y; 0 to 34 days post-injury, 15 non-traumatic). Nineteen of them had no analgesic treatment prior to the assessment whereas the analgesic treatment has been revised in the other 17 patients.

DATA ACQUISITION: Within 24 hours, patients were assessed during nursing care, before and after the administration of an analgesic treatment tailored to each patient. We administered the NCS-R but also the Glasgow Coma Scale (GCS)9 in order to observe fluctuations in the level of consciousness.

STATISTICAL ANALYSIS: We performed an ANOVA with the treatment (before vs. during) and the scales (NCS-R vs. GCS total scores and subscores) as repeated measures, and the level of consciousness (VS/UWS vs. MCS) and the etiology (traumatic vs. non-traumatic) as independent variables. Planned comparisons were used as post analyses. Results were thresholded for significance at p < 0.05.

RESULTS

A main effect of the treatment (F=16.87; p<0.001) as well as an interaction between the treatment and the scales (F=20.28; p<0.0001) and subscales (F=8.72; p<0.0001) have been found. We did not find an effect of the level of consciousness or the etiology. Post-hoc analyses revealed that NCS-R total scores were statistically lower during treatment when compared to the scores obtained before treatment (F=28.66; p<0.0001; see Figure). On the contrary, we found no difference between the GCS total scores obtained before vs. during treatment (see Figure). We also found that the motor subscores (F= 28.66; p<0.00001), the verbal subscores (F= 5.97; p<0.01), and the facial expression subscores (F=25.71; p<0.0001), were lower during treatment than before treatment.

CONCLUSIONS

According to our results, the NCS-R total scores but not the GCS total scores decreased substantially during analgesic treatment in severely brain-injured patients with documented painful areas. Our results suggest that the NCS-R is an interesting clinical tool in the management of pain of non-communicative patients with DOC.

REFERENCES
3. Chatelle et al. (2014) Neurorehabil Neural Repair, 28(2) 149-52

Poster number:0472