

Can the Patient State Index (PSI) Be Used a Measure of Sedation on the Intensive Care Unit (ICU)? Schneider G., Heglmeier S., Schneider J., Kochs, E. *Anesthesiology* 2002; 96: A298

Introduction

The patient state index (PSI, Physiometrix Inc.) is an EEG-derived parameter correlating with the state of consciousness during anesthesia [1, 2]. In addition to intraoperative monitoring, it might be useful to monitor the effect of sedation on the intensive care unit (ICU). So far, it has not been tested whether there is a correlation between PSI and the level of sedation in ICU-patients.

Methods

The present evaluation examines PSI and Ramsay score as a clinical measure of sedation in 30 patients on the ICU. Patients were intubated and sedated with continuous sufentanil and propofol infusion. With PSI-recording, patients were maintained without stimuli for at least 5 min. Following, the degree of sedation was evaluated using the Ramsay-score. The last PSI value before evaluation of Ramsay score was used for statistical analysis. One-way ANOVA was used to compare PSI-values at different score values. Prediction probability [3] for PSI was calculated with respect to Ramsay score.

Results

Ramsay scores of 2, 3, 5 and 6 were present. Figure 1 shows individual PSI values of different patients. The table shows mean PSI values and standard deviations at each of the sedation levels. Individual PSI values are shown in the figure 1.

The only significant difference was found between patients with Ramsay score 2 and 6 ($p < 0.05$). Prediction probability was 0.73 ± 0.08 .

Discussion

The present study in sedated and intubated ICU-patients found significant differences in PSI only between patients with Ramsay score 2 (cooperative, oriented, tranquil) and Ramsay score 6 (no response). Despite of significant differences between these levels, there was a wide overlap of PSI values between groups. Thus, PSI may not give a clear information about the present sedation status of an individual patient. One possible limitation is the small number of patients in the present study. A further limitation is the fact that not all possible levels of Ramsay-scores were met in our patients. However, even with this small number of patients and scoring levels, there is already an overlap of PSI-values between different levels of the Ramsay-score, reflecting a large inter-individual variability.

References: [1] Br J Anaesth 87: 421-8, 2001 [2] Conscious Cogn 10, 165-83, 2001 [3] Anesthesiology 84, 38-51, 1996.

Ramsay Score and PSI (mean ± SD)

Ramsay Score	1	2	3	4	5	6
PSI	n/a	80.4 ± 27.1*	57.0 ± 20.1	n/a	58.6 ± 16.1	45.1 ± 17.0

* significant difference to Ramsay 6, p<0.05

Figure 1

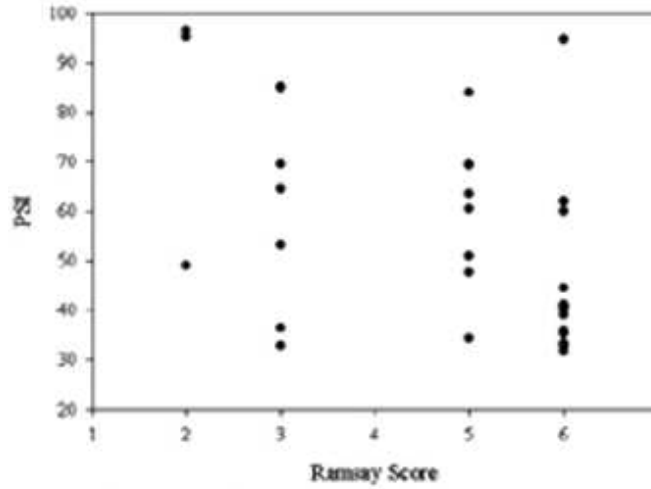


Figure 1: Ramsay Score and According Values of the Patient State Index (PSI)