

Daytime resting periods in neurorehabilitation

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Subject of interest

Daytime Resting Periods (DRPs) are an integrated part of in-hospital rehabilitation of patients suffering severe acquired brain injury (sABI). DRPs are supposed to consolidate the patient's motor and cognitive learning processes and to counteract fatigue. These potential effects depend on the quality of rest achieved during DRPs.

Purpose of this study

Therefore, it is of interest to assess whether quality of rest is measurable in patients who cannot express themselves. To date, no clinically feasible systematic measure of quality of rest has been documented for use in patients with sABI and disorders of consciousness or communication impairments.

Methods

Study population

This is an interim analysis of an observational study currently including 21 patients. Patients were recruited from a subacute rehabilitation ward and screened for eligibility according to set criteria: 1st admission to the rehabilitation hospital, referred due to sABI, ≥18 years old, ≤ 7 on the Rancho Los Amigos Scale, closest relative noted in record, not terminal ill, no spinal lesions and absence of paroxysmal sympathetic hyperactivity.

Measures

Clinical assessment

Subjects were monitored for 20 days during DRPs. Via a custom-made staff-administered clinical assessment (CA) we assessed quality of rest (QoR) post DRP. The CA contained the categories "Very good", "Good", "Bad", "Very bad" and "Insufficient information to assess quality of DRP". Consensus workshops and instruction of staff were conducted in order to achieve agreement a consensus on how to evaluate QoR. For scientific purposes QoR was dichotomized to be either "Good" or "Bad".

Recording modalities and aggregated parameters

The mean heartrate relative to the resting heart rate (HR/RHR) during DRPs, was recorded with electrocardiography (Mindray TM-80 wireless telemetry) and calculated. The Motor Rest Ratio (MRR) defined as the proportion of motor-inactive minutes relative to the duration of the DRP, was calculated based accelerometer (Actigraph wGT3X-BT) recordings.



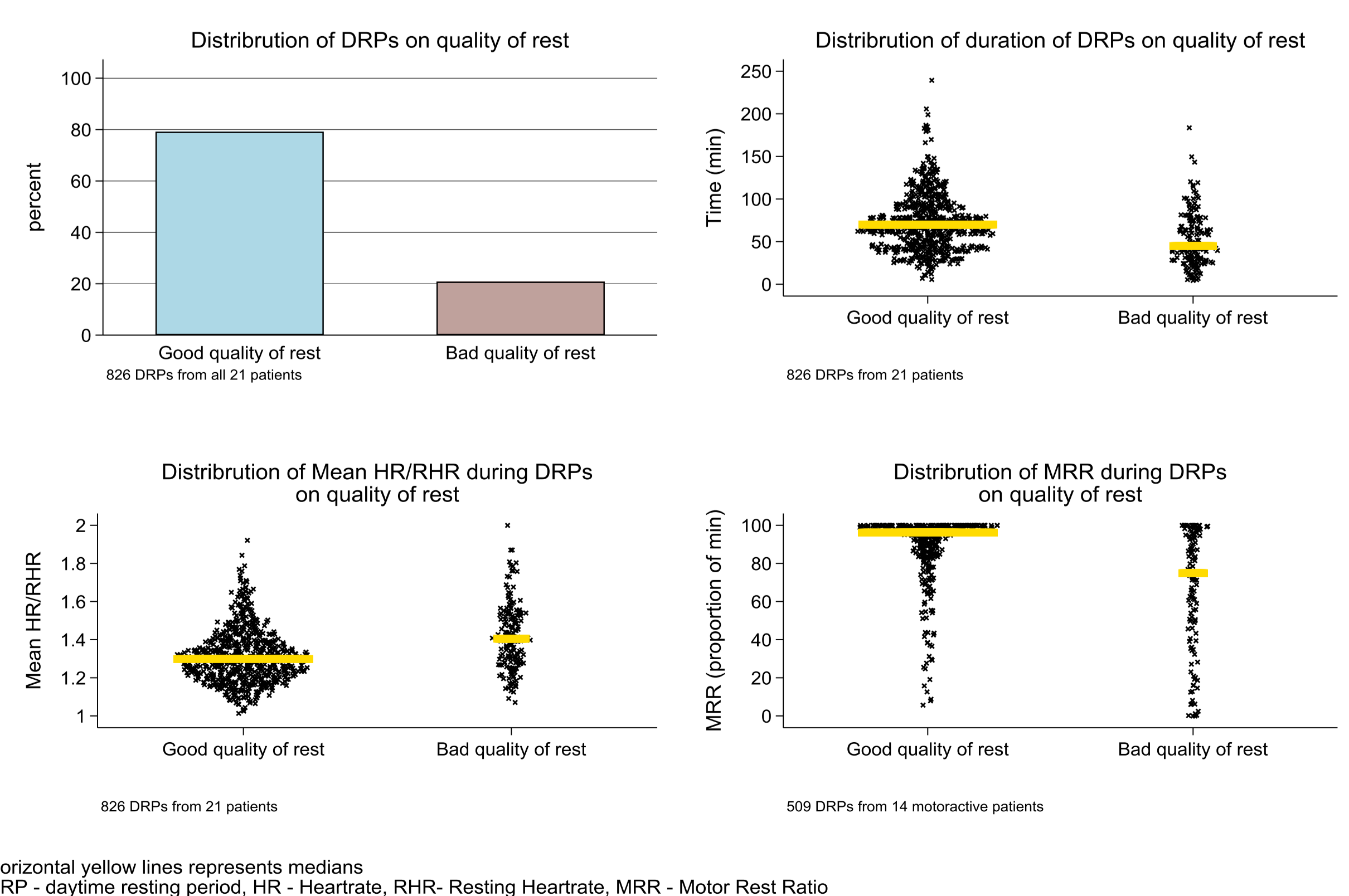
Table 1: Characteristics of patients included in the study

N		21
Gender	Female	7 (33%)
	Male	14 (67%)
Age(years) at inclusion, mean (SD) (n)		58 (14) (n=21)
Type of acquired brain injury	Stroke	18 (86%)
	Encephalopathy	1 (5%)
	Traumatic Brain Injury	2 (10%)
Days from injury to datarecording start, median (IQR) (n)		55 (48, 72) (n=21)
Days from admission to rehab to recording start, median (IQR) (n)		5 (4, 5) (n=21)
Most affected side	Left	9 (43%)
	Right	9 (43%)
	Equally affected	3 (14%)
BMI, mean (SD)		26.8 (5.0) (n=21)
RLAS Baseline, median (IQR)		4 (3, 6) (n=21)
EFA Baseline, median (IQR)		46 (40, 54) (n=21)
CRS-R Total Score, mean (SD)		18 (5) (n=19)

EFA – Early Functional Abilities, SD – BMI – Body Mass Index, CRS-R – Coma Recovery Scale Revised, RLAS – Rancho Los Amigos Scale, Standard Deviation, IQR – Inter Quartile Range.

Results & Conclusion

1103 Daytime resting periods were registered as initiated. In 150 cases QoR was missing or information was insufficient. In 53 cases no end time was reported. In 74 cases the mean HR or the MRR during DRP could not be calculated due to missing data. This left 826 DRPs with complete data. The median (IQR) count of DRPs per patient was 47 (27, 54), and the median(range) resting heart rate was 59 (44-83) Bpm. Patients were either deemed motor active (n=14, 509 DRPs) or motor in-active (n=7, 317 DRPs) as defined by diagnosis, consciousness levels and actograms from accelerometry. Motor in-active patients was excluded from MRR analysis. The high variation in HR/RHR and MRR within categories of QoR, indicates poor predictive power of physiological measurements on clinical assessment of QoR in this interim analysis.



Mindray TM-80 Telemetry unit
(Photo with permission from Mindray)



Actigraph wGT3X-BT
(Photo with permission from Actigraph)

