

1 INTRODUCTION

- Normative values and test–retest reliability for the nociceptive withdrawal reflex threshold (NWR-T) and the electrical pain threshold (EP-T) in pain-free subjects [1] and chronic pain patients [2] have recently been published, concluding that both measurements are reliable in experimental pain studies.
- However, it is necessary to investigate the reliability of the NWR-T and EP-T in clinical conditions, which often present significant differences compared to a research environment.
- A typical example would be the larger differences between patients and limited number of times that an assessment can be repeated for each outcome variable (given the time constrains commonly found in the clinic).

2 AIM

The aim of this study was to establish the reliability of the NWR-T and EP-T in a clinical environment

3 METHODS

- Two hundred and fifty eight patients with chronic pain (110 men and 148 women, mean age 51 years, range 16–88 years) participated in the study. They were consecutive patients derived from the Pain Clinic at Inselspital (Bern, Switzerland).
- In order to assess the NWR-T and EP-T, electrical stimulation was performed through surface electrodes placed caudal to the lateral malleolus, at the innervation area of the sural nerve, and the reflex response was assessed at the biceps femoris muscle.
- Subjects were thoroughly familiarized with the electrical stimulation prior to the assessment of the NWR-T and the EP-T.
- Both thresholds were assessed three consecutive times (with a 10-30 s interval between assessments), and median values were derived.
- Kruskal-Wallis One Way ANOVA (KW) was performed to compare the three assessments and the median for each variable.
- Coefficient of Variation (CV) and Coefficient of Repeatability (CR) were used to assess reliability.

4 METHODS (CONT.)

Experimental setup

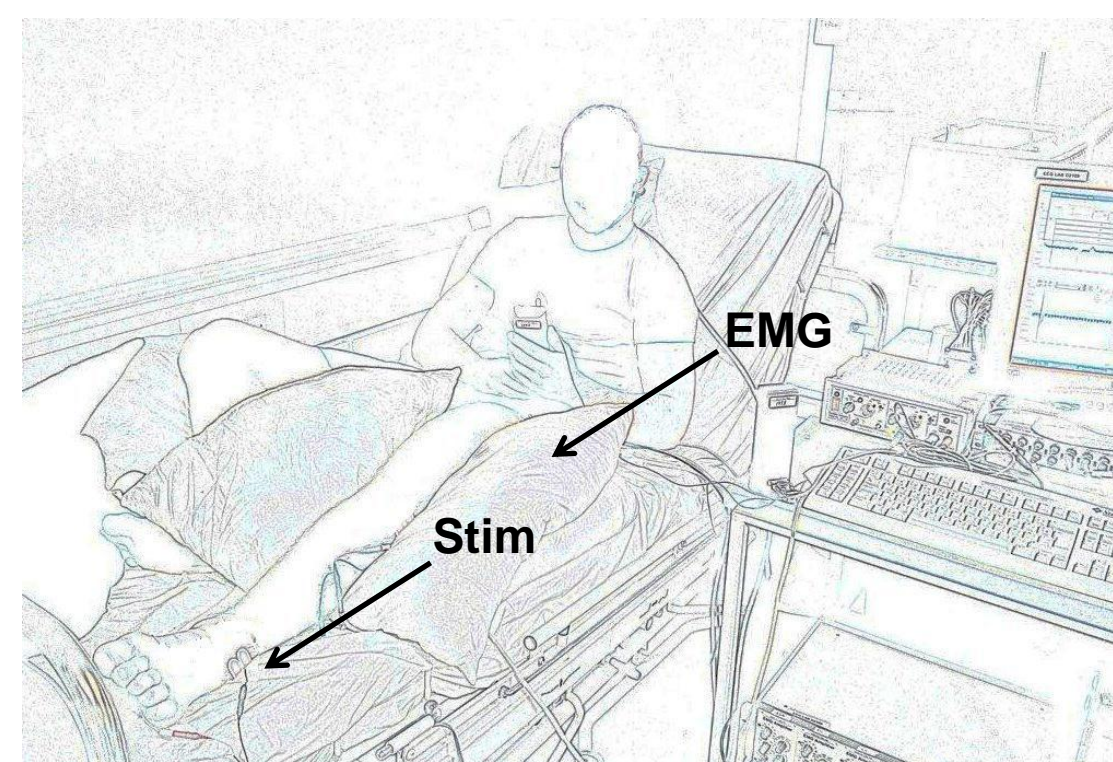


Figure 1. Electrical stimulation (Stim) was performed through surface electrodes at the innervation area of the sural nerve, end electromyographic (EMG) signals were recorded at the biceps femoris muscle.

5 RESULTS

NWR threshold

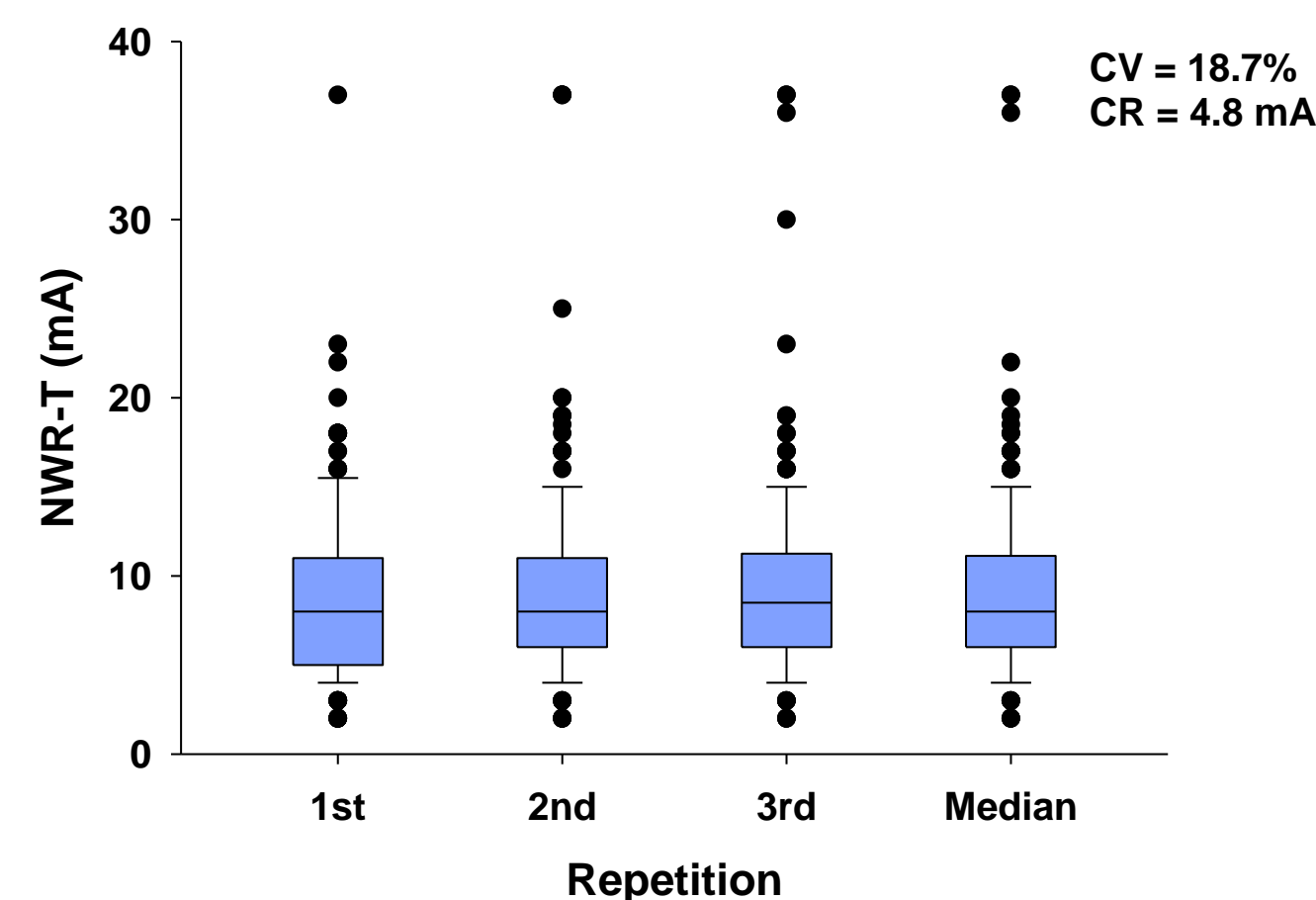


Figure 2. NWR-T after three consecutive assessments, along with median NWR-T. KW test revealed that there were no significant differences between the three assessments and the median for the NWR-T ($H = 0.96$, $df=3$, $p = 0.81$, $N=174$).

6 RESULTS (CONT.)

EP threshold

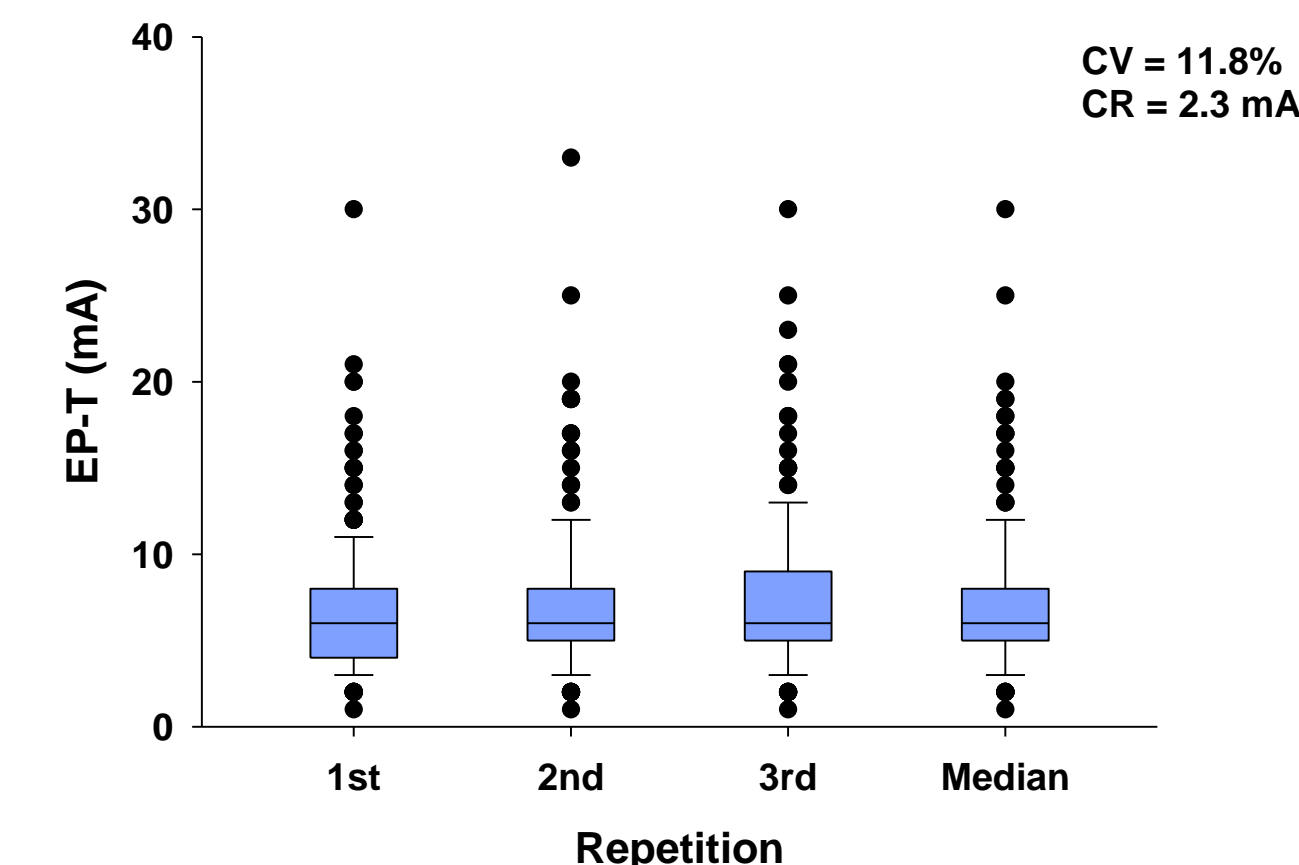


Figure 3. EP-T after three consecutive assessments, along with median EP-T. KW test revealed that there were no significant differences between the three assessments and the median for the EP-T ($H = 3.60$, $df = 3$, $p = 0.30$, $N=258$).

7 CONCLUSIONS

- The statistical analysis showed that it is not necessary to repeat the NWR-T and EP-T assessment three times, since there is no statistical difference among the three consecutive assessments, or between any of the assessments and the median.
- The reliability of the NWR-T and EP-T was lower compared to previous results on experimental conditions, probably due to larger variations in the chronic pain population or differences in the assessment methodology. However, their current reliability levels are still acceptable for clinical use.

REFERENCES

- [1] Micalos, PS, Drinkwater, EJ, Cannon, J, Arendt-Nielsen, L & Marino, FE 2009, 'Reliability of the nociceptive flexor reflex (R111) threshold and association with Pain threshold' European Journal of Applied Physiology, vol 105, nr. 1, s. 55-62.
- [2] Biurrun Manresa, J, Neziri, AY, Curatolo, M, Arendt-Nielsen, L & Andersen, OK 2011, 'Test–retest reliability of the nociceptive withdrawal reflex and electrical pain thresholds after single and repeated stimulation in patients with chronic low back pain' European Journal of Applied Physiology, vol 111, nr. 1, s. 83-92.