DIAGNOSTIC VALUE OF BLINK REFLEX LATIENCIES FOR PATIENTS WITH IDIOPATHIC TRIGEMINAL NEURALGIA

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Objectives: Trigeminal neuralgia (TN) is considered to be one of the most painful conditions. The aim of this research was to determine the differences in blink reflex latencies as a diagnotic tool for unilaterally idiopathic TN compared with pain-free health volunteers.

Methods. A prospective cohort study was conducted over 2 years. The final subgroup TN-Subgroup) included 15 patients (mean age / SD 62.3±10,7 years; 10 (66,7%) female). Blink-eliciting stimuli were performed by surface electrodes to stimulate the supraorbital nerve at the foreheaed. On the basis of their medical history and a clinical examination, patients with a history of stroke, cranial nerve lesions, polyneuropathy, drug-induced neuropathy, multiple sclerosis, epilepsy, intracranial neoplasam or intracranaial infection were initialy excluded. Pain-free and healthy volunteers as a HV-Subgroup (mean age / SD: 30,8±8.1 years; 12 (75%) female) were recruited from asymptomatic students of dental medicine.

Diagnostic parameters were determined by measuring latency (in ms) to the onset of the reflex comoponents from electric stimulation. The shortest latency values obtained were taken into account. They were composed of homolateral early response R1 and bilateral late response R2 (homolateral response), and R2c (contrallaterly expresed response), the occurance of ipsilateral/contralateral R3/R3c component, and side-to-side difference for R1, R2 and R2c latencies (Figure 1). The level of anxiety was evaluated by Spielberger's psychological measuring instrument State-Trait Anxiety Inventory (STAI 1 - concerning anxiety as subjective state, feeling during a period of one week, including the day of examination, and STAI 2 - concerning anxiety as a relatively stable individual characteristic in general throughout life). STAI was compared between NT and HV subgroups. At the request of the Ethics Committee, School of Dental Medicine, University of Zagreb, all subjects signed an Informed Consent confirming their voluntary participation in this research.

Results: An unilateral TN was diagnosed on the right side in 53% pacijenata (Figure 2). There was no difference in sex distribution between NT and HV subgroups (Fischer's exact test p = 0.4815). The following anxiety scores with statistically significance were found comparing TN-subgroup / HV subgroup – STAI 1: 45.06 ± 8.90 /31.94 ± 10.25 and STAI 2: 43.12 ± 9.30 /35.00 ± 10.11 respectively (p=0.0001 / p=0.009). Blink reflex latencies of stimulation values left and right side together between subgroups were significantly higher for latencies values R1, R2, R2c at TN-subgroup ($p < 0.05$) (Table 1). The blink reflex result of equal latencies for the patient group (TN) only according the unilaterally affected side with trigeminal neuralgia was without a statistically significant difference ($p > 0.05$) (Table 2). Other blink reflex parameters were analyzed, such as the absence of R1 latency, and the presence of R1c, R3, and R3c latencies. Although all these variables were abnormal findings of the blink reflex, no statistically significant difference was found between the examined subgroups ($p > 0.05$) (Table 3).

Conclusion. Nociceptive blink reflex is a non-invasive and painless method with the purpose of objectifying neuropathic pain in different groups of patients. Recognizing conditions such as TN is important for managing non-dental orofacial pain. Blink-reflex parameters (R1, R2 and R2c) were significantly abnormal not only upon comparing TN-patients with healthy volunteers, but also upon comparing the patient's healthy side with his/her unilateral side affected with TN. The R3 component of the reflex was related to noxious stimuli, likewise by innocuous stimuli.

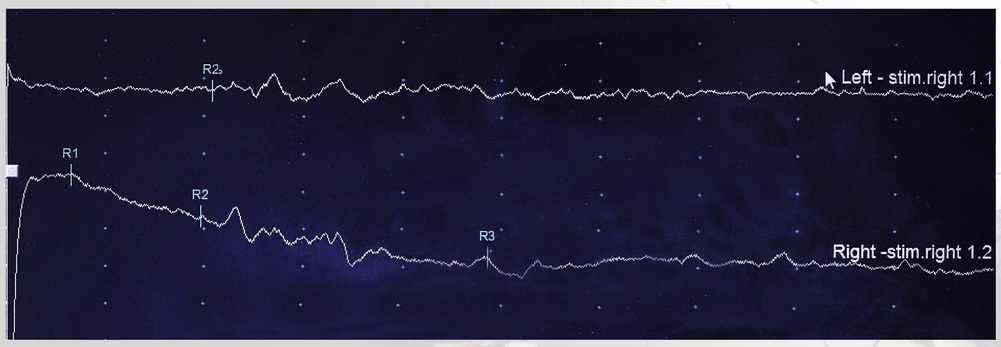

Figure 1. Blink reflex-related waves of the right side of stimulation composed of a homolateral: early response R, late response R2 (homolateral response), and occurrence of ipsilateral R3 component. R2c is a contralaterally expressed response.

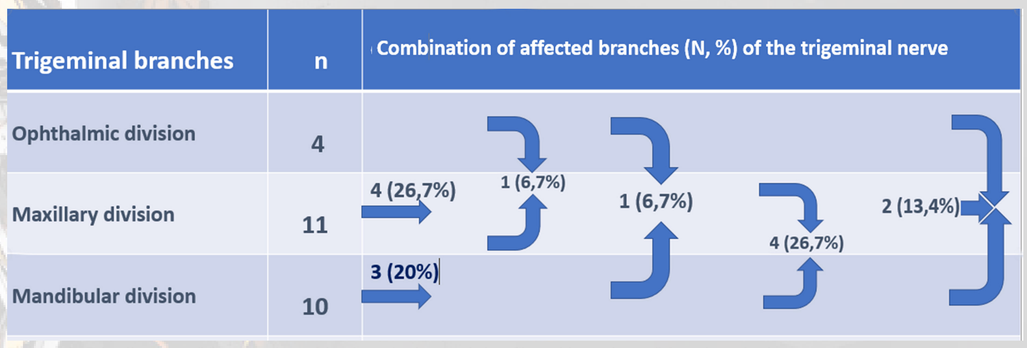

Figure 2. Distribution of frequencies with trigeminal neuralgia affected branches of the trigeminal nerve.

Variable, stimulation (ms)	TN-subgroup (mean ±SD)	HV-subgroup (mean ±SD)	t-test	p
R1 right +left side	15.13±3.86	13.57±1.43	2.13	0.019*
R2 right +left side	42.99±10.88	37.28±5.27	2.66	0.005*
R2c right +left side	44.42±12.49	37.05±5.76	3.01	0.002*

Table 1. Blink reflex latencies of stimulation values left and right side together between subgroups (TN -subgroup of trigeminal neuralgia; HV -subgroup of health volunteers; SD -standard deviation; * -with statistical significance).

Variable, side of stimulation (ms)	TN-subgroup (mean±SD)	Paired t-test	p
R1 right	15.65 ± 5.19	-0,74	0.472
R1 left	14.74 ± 2.33		
R2 right	42.80±11.88	-0.56	0.582
R2 left	41.17±9.40		
R2c right	41.68±12.02	-0.29	0.772
R2c left	40.81±11.16		

Table 2. Comparison of latency values between right and left sides for TN patients (TN -subgroup of trigeminal neuralgia; SD -standard deviation)

Variables	TN-subgroup (n)	HV-subgroup (n)	Fischer's exact test
Presence of R1c	3	1	p=0.333
Presence of R3	7	2	p=0.054
Presence of R3c	2	2	p=1.000

Table 3. Comparison of other parameters describing the consideration of the blink reflex abnormality (TN -subgroup of trigeminal neuralgia; HV -subgroup of health volunteers; n -number of subjects).