

## **APPLICATION OF DENS IN COMPLEX TREATING OF PATIENTS WITH OLD COMPLICATED VERTEBRAL COLUMN INJURIES**

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Complicated vertebral column injury constitutes 11 to 50 % of all vertebral column injuries. Within severe spinal injuries about 75-80% of patients go through acute stage and stay alive (Polishuk N.E, 1998; Fishenko V.Ya, 2004). Eventually spinal cord wound dystrophy develops and results in all vitals dysfunction (respiratory, musculoskeletal, vascular, excretory, immune system, alimentary canal – and it is the reason of the life period reduction (Fishenko V.Ya, 1996, Hvisuk N.I. 1996, Bersnev V.P. and co-authors, 1998, Ulrich U.V. and co-authors, 2002).

One of the highly complicated problems in present-day medicine – that owns powerful collection of medicines – is their adverse reactions and toxic effect. Therefore development of nondrug treatment means – free from these disadvantages – stays relevant. One of the most prospective methods for today is dynamic electroneurostimulation method (DENS). Use simplicity, non-invasiveness, and absence of toxicity and allergic effect allow using DENS for a long period of time and getting strong clinical effect.

At the restorative orthopedy and warning patients rehabilitation department in complex of restorative treatment methods apparatus DiaDENS-T was used for treatment 20 spinal patients with different injuries stages and levels. Comparative analysis in 20 patients treatment dynamic (control group), who didn't take DENS, was conducted simultaneously. Patients of 21 to 44 years old – that is young and middle-aged people (able-bodied citizens) – constituted the majority of main and control group. Among all the patients men-victim twice outnumbered women-victim. The patients were complaining of pain in spine, upper and/or lower extremities, muscular spasticity, sensitivity impairment, pelvic organs dysfunction, depending on spinal injury degree, were observed. Algic syndrome intensity rate was estimated by rather changed scale of F. Denis (1984). Spasticity degree was rated by modified spasticity Ashfort scale (by R.Bohannon, V.Smith, D. Wade. 1992).

Pelvic organs function was rated by 5 scores scale. (table 1).

Table 1  
Rating scale for pelvic organs dysfunction

<b>Scores</b>	<b>Compensation level</b>
5	Normal functioning
4	Optimal compensation

3	Satisfactory compensation
2	Minimal compensation
1	Unsatisfactory compensation

Spinal automatism was estimated by Mary-Fua defense reflex presence in scores (table 2).

Table 2  
Rating scale for defense reflex presence by Mary-Fua

Scores	Dysfunction degree
2	Lack of reflexes
1	Flexural answer
0	Cross reflex presence

The following standard treatment methods were used to treat spinal patients:

- Drug therapy (B group vitamins, vascular, nonsteroid preparations, chondroprotectors, biogenic stimulators, preparations for improvement of nerve conduction, muscle relaxants (mydocalm, syrdalud, baklofen).
- Physiotherapy (muscle electro stimulation, medicine electrophoresis, low-frequency magnetotherapy)
- Massage, exercise therapy

DENS by apparatus DiaDENS-T against standard treatment was used in 20 patients.

The electro stimulation was conducted in segmental spine zones, in zones of located painfulness, in acupuncture points (AP), in extremities points (according to the points of injured spine segments). 10, 20, 77, 140 Hz frequencies were used in labile, labile-stabile, and stabile mode. Labile impact method and its modification – labile-stabile variant that supposes impact time increase in painful zones, – were used as well as stable impact method consisting in impact on AT and/or in injured organ projection. Impact intensity was determined by subjective patient's sensations, sometimes it reached pain barrier. Points and zones electro stimulation duration was 1 to 10 minutes. Overall procedure duration was 20 to 40 minutes. The procedures were conducted every day, 1-2 times with interval of no less than 5 hours. The treatment course was 10 to 20 procedures.

Scores system proposed by B. Lassale, A. Deburge, M. Benoist (1985) in our modification was used for efficiency quantitative assessment. For that the following formula was used:

$(S_2 - S_1) / (S_m - S_1) * 100\%$ , where

$S_1$  is initial scores sum calculated before treatment;

$S_2$  is scores sum calculated after the treatment;

$S_m$  is maximal scores sum (always 34).

Spinal patients' treatment efficiency included rather changed scale of F. Denis in scores for pain syndrome, slightly modified ASHFORT scale, Mary-Fua's defense reflex and rating scale for pelvic organs dysfunction assessment in scores.

Clinical abnormalities were assessed in such a way:

- very good – when improved for more than 60%
- good – from 40 to 60%
- moderate – from 10 to 40%
- rest – less than 10%.

During general clinical results assessment after complex medical rehabilitation we got following results:

Table 3

Comparative assessment of treatment results in main and control group

Results	Main Group		Control Group	
	Number of patients	%	Number of patients	%
Very Good	2	10	-	-
Good	9	45	6	30
Moderate	9	45	14	70

## CONCLUSION

DENS use efficiency within medical rehabilitation complex in 20 patients with different spinal injuries' stages and degrees was shown. It is recommended to conduct DENS 1-2 times a day with interval of 5 hours and procedure duration of 10 to 40 minutes; treatment course will be 10 days. DENS application in spinal patients forces rehabilitation process. General well-being improvement is observed, pain syndrome on spine and extremities reduces, effective cortical control of motion activity and internal function appears, muscle spasticity reduces, pelvic organs function improves. Complex treatment

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we propose with DENS apparatuses use allowed significant refining of spinal patients rehabilitation results.