

## THE ILIZAROW METHOD – COMPLIKATION, DIFFICULTIES AND PROBLEMS.

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Limb lengthening is a very attractive procedure in orthopedic surgery, but it is connected with a significant number of complications. Among the essential problems entailed in this process are spastic contractures, disturbances of the limb axis, limitations in the range of mobility in joints adjacent to the lengthened segment.

This article discusses the impact of certain factors on the psychological status of a patient treated by Ilizarov method.

## COMPARISON BETWEEN SUPERFICIAL SENSIBILITY IN A PARETIC UPPER LIMB AND A HEALTHY UPPER LIMB IN PEOPLE AFTER STROKE

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### Introduction

Symptomatology of cerebro-vascular diseases was already known in the antiquity. Nevertheless, their connection with structural changes in tissues and cerebral vessels was proved by a Swiss scientist J.J. Waper and Englishman T. Willis [3] in the second half of the 17<sup>th</sup> century.

Focal or global disorder of the function of brain that has vascular aetiology, occurs abruptly and persists for more than 24 hours has been named by the World Health Organisation as a stroke. The definition applies to:

- 1) acute ischaemia,
- 2) intracerebral haemorrhage,
- 3) subarachnoid haemorrhage.

Cerebrovascular diseases are one of the most frequent causes of death and invalidism. The death rate is rising in many countries. The factors increasing risk of occurrence of cerebrovascular diseases are: arterial hypertension, heart disease, diabetes, disorder of fat metabolism, increased haematocrit values, nicotinism, alcoholism [1].

Disorders of brain function can be divided into focal and global.

To focal disturbances of brain function, which involve disconnection of specific tracts and brain centres, belong:

- motor-coordination (paresis, dysphagia, paralysis of eyeballs, cerebellar symptoms, chorea, symptoms of Parkinson disease),
- information-perception (disturbances of vision, dysacusis, dysaesthesia, aphasia, agnosia, intellectual, disturbances of consciousness).

To global disturbances of brain function, which are characterised by switching of activating action of non-specific reticular system of the brain stem, belong the following disturbances:

- of consciousness
- regulation of myotonus (decerebrate rigidity, flaccidity),
- reflexes (pupillary reflexes, corneal reflexes, oculocephalic reflexes, deep reflexes),
- vegetative functions (pulse, arterial tension, respiration, temperature and other)

Global disturbances of brain function may accompany focal neurological deficiency [3].

Stroke disturbs the processes of receiving and processing all sensory stimulus. The most of being lost are tactile sense and information from proprioceptors. Nevertheless, there occurs dysopia, disturbance of taste, hearing and sense of smell. Loss or disturbance of asia affects sense of personal safety, hinders food intake and articulation [2].

### Aim of the study

The aim of the study was to assess and compare superficial sensibility of a paretic upper and a healthy upper limb in patients after stroke.

### Material and research method

The studies were conducted in a group of 25 people after stroke – 14 women and 11. The age range was 58-89. These were mostly right-handed people. They had stroke 1 to 8 years ago. Paretic upper limb and healthy upper limb were examined.

The characteristics of the people participating in the studies is presented in table 1.

Tab. 1.

The characteristics of the research group

Patients after stroke					
Number	sex	age	Date of falling ill	Dominant hand	Side of paresis
1	F	67	2000	Right	right
2	F	78	2001	Right	Right
3	F	80	1998	Right	Right
4	F	71	1994	Right	Left
5	F	78	2001	Right	Right
6	F	89	1997	Right	Right
7	F	82	1994	Right	Right
8	F	87	2001	Right	Left
9	F	58	2001	Right	Right
10	F	73	1999	Right	Right
11	F	71	1999	Right	Left
12	F	65	2001	Right	Left
13	F	59	2001	Right	Right
14	F	69	2001	Right	Without paresis
15	M	72	1996	Right	Right
16	M	70	2001	Right	Left
17	M	67	2001	Right	Right
18	M	70	1998	Left	Left
19	M	69	2001	Right	Left
20	M	65	2000	Right	Left
21	M	62	2001	Right	Right
22	M	67	2001	Right	Left
23	M	52	2001	Right	Left
24	M	62	2000	Right	Right
25	M	77	2002	Right	Left

The examinations carried out using aesthesiometer J.V.P. Domes (the name is derived from the first letters of the creators of the aesthesiometer). The instrument consists of eight plastic delicately rounded domes with 25 mm diameter and carved grooves of different width (0,35; 0,5; 1.00; 1,2; 1.5; 2.0 and 3,0 mm).

The domes are used to measure spatial sensibility on the skin surface of lips, tongue and fingers.

Each dome is attached to cylindrical hand, which makes it easy to use.

The procedure

The examined people sat in a comfortable position and the tested surfaces were within easy reach of the examiner. The examined people had covered eyes or closed their eyes so as not to see tested surface. Each of the examined people had minimum 10 trials. The examiners applied grooves of a dome vertically or horizontally on the pulp of index finger of paretic limb, making sure that the dome did not move along the surface of the tested finger. The task of the examined person was to determine positioning of the grooves (along, across). The patient's answer was noted after each trial and chosen results of the trial were noted. The minimum number of trials was 10.

Derived results were substituted in the following formula:

$$g_{75} = g_{low} + \frac{(0.75 - p_{low})}{(p_{high} - p_{low})} (g_{high} - g_{low})$$

Where:

$g$  – distance between grooves

$p$  – the number of correct answers by  $n$

$n$  – the number of trials

$high$  – refers to the domes with the smallest distances of grooves which the examined person recognised in more than 75 %.

$low$  – refers to the domes with the biggest width of grooves which the examined person recognised in less than 75 %.

Findings of the study

Table 2 shows mean results, processed using DIFF programme, for paretic upper limb and healthy upper limb in the group of women and in the group of men and the results of T-Student test.

Table 2.

### The results in the group of women and in the group of men

	women		men	
	Paretic upper limb	Healthy upper limb	Paretic upper limb	Healthy upper limb
Mean value	1.081	0.937	0.833	1.35
Difference	0.937		0.145	
T-Student	2.39		1.35	
p	0.0324		0.2075	

As the table shows, the results of T-Student test, which tests if there is difference in touch sensibility between paretic upper limb and healthy upper limb, shows statistically significant difference in the group of women –  $p < 0,0324$  between examined limbs, no statistically significant difference was found  $p < 0,2075$ .

Additionally, results in the group of women and men were compared and T-Student test did not reveal significant difference between the groups. The results are presented in the table 3. The researchers also studied how the examined feature behaves in the whole group. Comparison was made between paretic upper limb and healthy upper limb using T-Student test. No statistically significant difference was found. The results of the test are shown in table 4.

Table 3.

**The results of T-Student test between the group of women and men.**

Mean value	T-Student	p
women	1.305	2.2049
men	1.611	0.1356

Table 4.

**The results of T-Student test between healthy limb and paretic limb in the whole research group.**

	Mean value	T-Student	p
Paretic upper limb	0.9936	1.4161	0.0815
Healthy upper limb	0.8496	1.6772	0.1631

Derived results confirm well known fact that superficial dysaesthesia occurs in people after stroke. Therefore, it seems to be vital that all kinds of methods aimed at improving superficial sensibility, for instance various physical procedures and massage, should be included in the process of physiotherapeutic rehabilitation.

**Conclusions:**

1. Superficial sensibility measured and compared between healthy upper limb and paretic upper limb in people after stroke shows statistically significant difference in the group of women.
2. Superficial sensibility measured in the group of men does not reveal statistically significant difference.
3. Measurement of touch sensibility in healthy upper limb and paretic upper limb did not reveal statistically significant difference in the examined trait in the whole group.

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**CEREBRO-VASCULAR DISEASES ARE ONE OF THE MOST PREVALENT CAUSES OF DEATH AND INVALIDISM AND THERE ARE INCREASINGLY MORE DEATHS CAUSED BY THESE DISEASES.**

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The risk factors are: arterial hypertension, heart diseases, diabetes, disorder of fat metabolism, nicotinism, alcoholism. One of the numerous focal and global disorders of the function of brain is dysaesthesia. Stroke causes disruption to the processes of receiving and processing of all sensory stimulus. The most at risk of being lost is tactile sense and information from proprioceptors, but vision, hearing and sense of smell are also at risk. Loss or disorder of tactile sense affects sense of personal safety, hinders intake of food and articulation. The authors of the research paper studied differences in tactile sense in a paretic upper limb and a healthy upper limb in a group of women and a group of men after stroke. The research method consisted in measuring spatial touch sensibility on the pulps of fingers using aesthesiometer. The studies revealed statistically significant difference in superficial sensibility between healthy upper limb and paretic upper limb in the group of women. No statistically significant differences were found in other studied cases.

Key words: stroke, superficial dysaesthesia

## ФІЗИЧНА РЕАБІЛІТАЦІЯ ПРИ СКОЛІОТИЧНІЙ ХВОРОБІ

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Про сколіоз (сколіотичну хворобу) люди знають давно. У медицині існує таке визначення цієї патології: сколіоз – захворювання опорно-рухового апарату, що характеризується викривленням хребта у фронтальній площині з торсією хребців (скручуванням їхніх у процесі росту), що веде до порушень функції органів грудної клітини, а також до косметичних дефектів.

Сучасні знання про сколіоз дозволяють відрізнити сколіоз від порушення постави. Порушення постави у фронтальній площині є нестійким бічним відхиленням хребта і зникає в положенні хворого лежачи на спині чи животі. Клінічної і рентгенологічної торсії хребців при порушенні постави немає.

Сколіотична хвороба є однієї з найбільш складних і актуальних проблем сучасної ортопедії і педіатрії. Їй присвячено цілий ряд фундаментальних досліджень вітчизняних авторів [3,5,7]. Питання етіології, патогенезу, лікування і профілактики сколіозу знаходяться постійно в центрі уваги і піддаються всебічному обговоренню на різних симпозіумах, наукових сесіях і конференціях. Така пильна увага до сколіозу порозумівається тим, що при прогресуванні даного захворювання виникають порушення в найважливіших системах організму, що призводять до зменшення тривалості життя, порушення працездатності й інвалідності.

При сколіотичній хворобі порушується не тільки функція та структура опорно-рухової та нервової системи, а більшою мірою спостерігаються зрушення з боку серцево-судинної, дихальної та інших систем організму. Однак, ці порушення найчастіше ведуть до інвалідності, зниженої працездатності і зменшеній опірності хворих дітей до інфекцій і простудних факторів, причиною передчасних летальних випадків.

В останні роки досягнуто значних успіхів у вихованні правильної постави у дітей, розроблені різні методики формування і корекції порушень з використанням спеціальних коригуючих вправ, лікувального плавання, лікувального масажу і фізіотерапевтичних