Effects of the functional magnetic stimulation on the urinal incontinence in persons with multiple sclerosis (MS): The introduction and the results.

Purpose

Functional magnetic stimulation (FMS) with a magnetic probe installed in the centre of a special chair is used for treating different types of incontinence. The used magnetic field reaches strengths up to 2 T. This field causes the muscles of the pelvic floor to contract. Each interval of contraction lasting 6 seconds is followed with 6 second interval of rest. The therapy lasts for 20 minutes. The appropriate program of stimulation is chosen from the device's programs based on the type of the incontinence (urgent, mixed or stressed) diagnosed by the doctor. Therapy is performed at most every second day. Important aspect of this kind of therapy is its non-invasiveness and the fact that the patient can stay dressed. The purpose of this study was to determine if the FMS therapy with 6 treatments in 14 days can significantly improve the incontinence problems in persons with multiple sclerosis (MS).

Sample

The sample included 58 persons with MS who visited natural spa Terme Topolscica (Topolscica, Slovenia) for a restorative rehabilitation, consented to treatment of miction problems with FMS and had no contraindications. We calculated statistics for 56 persons form the sample that had problems of urgent incontinence and patients with problems with urgent incontinence combined with the stress incontinence (mixed incontinence). The remaining 2 persons were excluded because their stress incontinence was not a consequence of MS. The study was started on 26.1.2015 and concluded on 18.4.2015

In the sample there were 43 females and 13 males (56 persons all together). The youngest person was 22 years old and the oldest 73 years old. The mean age was 52.89 years.

They were diagnosed with MS from 1 to 40 years before the start of the study. The mean time since the diagnosis to the beginning of the study was 13.88 years.

37 person had urgent incontinence and 19 persons had mixed incontinence.

Method

At the beginning of the restorative rehabilitation every person from the sample was thoroughly interviewed about their problems with urination. Based on the interview diagnosis was made. If there were no contraindications and the person agreed to the treatment with the FMS the most appropriate program was selected

At the beginning of the therapy every person was interviewed with a validated questionnaire for miction problems (IPSS – the international questionnaire about symptoms related to prostate problems). We choose this questionnaire despite it being made for detection of symptoms of prostate problems because it includes all the important questions for diagnosis of urination problems

Questions in the questionnaire regard problems with incomplete emptying of the bladder, frequency of urination, interruptions to urination, urgency of the urination, the strength of the flow, the

exertion needed to urinate, urination during the night and how urination affects the quality of the living. The participant is asked to rate the question with numbers from 0 to 5. The smaller the number the less severe the problem is judged to be. The quality of living is measured on the scale from 0 to 6, smaller number means better quality of living.

After 6 FMS therapies we repeated the interview with the IPSS and again after one month after the last FMS. The first two interviews were done in person and the last one over the phone.

All the data were entered in to the SPSS (program for statistics) and a simple t test was performed.

Results

1. Incomplete emptying of the bladder. How many times in the last month did you have a feeling of incomplete emptying of the bladder? The possible answers:
   0- never
   1- less than 1 time per 5 urinations
   2- with less than half of the urinations
   3- with half of the urinations
   4- with more than half of the urinations
   5- almost always

Before the therapy the average of result was 2.482, after conclusion of the therapy the average of result was 1.768, after one month after the therapy the average of results was 1.250. The improvement in the feeling of incomplete urination after one month was 1.232.

The difference was statistically significant with $p < 0.001$.

2. Frequency of urination. How many times in the last month did you had to urinate less than 2 hours after the last urination? The possible answers:

0- never
1- less than 1 time per 5 urinations
2- with less than half of the urinations
3- with half of the urinations
4- with more than half of the urinations
5- almost always

Before the therapy the average of result was 3.036, after conclusion of the therapy the average of result was 2.375, after one month after the therapy the average of results was 2.018. The improvement in the frequency of urination after one month was 1.018.

The difference was statistically significant with $p < 0.001$.

3. Interruptions to the urination. How many times in the last month did you experience interruption to the flow of the urine and had to start the urination several times? Possible answers:
   0- never
   1- less than 1 time per 5 urinations
   2- with less than half of the urinations
   3- with half of the urinations
   4- with more than half of the urinations
   5- almost always

Before the therapy the average of result was 2.143, after conclusion of the therapy the average of result was 1.625, after one month after the therapy the average of results was 1.411. The improvement in interruptions to the urination after one month was 0.732.

The difference was statistically significant with $p < 0.001$.

4. Urgency of urination: How often did you have problems delaying urination in the last month? The possible answers:
   0- never
   1- less than 1 time per 5 urinations
   2- with less than half of the urinations
   3- with half of the urinations
   4- with more than half of the urinations
   5- almost always

Before the therapy the average of result was 3.232, after conclusion of the therapy the average of result was 2.464, after one month after the therapy the average of results was 2.054. The improvement in the feeling of urgency of urination after one month was 1.178.

With $p < 0.01$.

5. Weak urine flow: How many time in the last month did you have a weak flow of urine? Possible answers:
   0- never
   1- less than 1 time per 5 urinations
   2- with less than half of the urinations
   3- with half of the urinations
   4- with more than half of the urinations
   5- almost always

Before the therapy the average of result was 1.929, after conclusion of the therapy the average of result was 1.214, after one month after the therapy the average of results was 1.000. The improvement in the weak urine flow after one month was 0.929.

The difference was statistically significant with $p < 0.001$.

6. Exertion needed to urinate: How many times in the last month did you have to exert yourself to achieve urination? Possible answers:
   0- never
   1- less than 1 time per 5 urinations
   2- with less than half of the urinations
   3- with half of the urinations
   4- with more than half of the urinations
   5- almost always

Before the therapy the average of result was 0.982, after conclusion of the therapy the average of result was 0.464, after one month after the therapy the average of results was 0.393. The improvement in the exertion needed to urinate after one month was 0.589.

The difference was statistically significant with $p < 0.001$.

7. Urination during the night: How many times per night do you on average have to get up to urinate? Possible answers:
   0- never
   1- 1x
   2- 2x
   3- 3x
   4- 4x
   5- 5x or more

Before the therapy the average of result was 2.196, after conclusion of the therapy the average of result was 1.518, after one month after the therapy the average of results was 1.036. The improvement in the urination during the night after one month was 1.160.

The difference was statistically significant with $p < 0.001$.

8. Quality of life: How would you feel if you had to live for the rest of your life with your current state of urination: Possible answers:
   0- happy
   1- content
   2- mildly content
   3- mixed feelings
   4- mostly discontent
   5- unhappy
   6- miserable

Before the therapy the average of result was 2.536, after conclusion of the therapy the average of result was 1.929, after one month after the therapy the average of results was 1.554. The improvement in the urination during the night after one month was 0.982.

The difference was statistically significant with $p < 0.001$.

Discussion

On the basis of this study we can conclude that the most common problems of persons with MS are the frequency of urination, feeling of incomplete emptying of the bladder, urgency of urination and urination during the night.

The FMS therapy showed to be most effective in treating the feeling of incomplete emptying go the bladder, urgency of urination, night urination and the frequency of urination. In all cases improvement was more than one point.

In addition the persons in the sample noticed improvements in bowel movement, lessening of lower back pains and hips. One of the males reported return of night erections. Several reported reduced need to go to the toilet during swimming sessions in thermal water. Women reported that they were noticeably more relaxed during strolls as they no longer had to plan for possible needs to go to the toilet. To evaluate these effects we would need to complete another study as they were not the object of this one.

At the conclusion here are some things people told to the nurse Mirijam after the conclusion of the interview:

During the sessions on the chair I learned how to do kegel exercises in the correct manner.

My bowel movements were improved after the chair sessions.

The chair rocks!

The chair is just the thing!

I am really happy because I no longer have so many problems with urination.

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