

Effect on the Treatment of the Abnormal Gait by the Sacral Occipital Technique and the Therapeutic Electrical Stimulation

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Abstract We have studied to find out the effect of the treatment of abnormal gait and to improve the evaluative indices of the gait by using the Sacral Occipital Technique (SOT) category II, III method and the Therapeutic Electrical Stimulation. In order to collect the clinic data to treat the cases with abnormal gait we have applied the SOT category II, III method and the evaluative indices of the gait such as width of the base, average length of a step and average number of a step. Also we have studied to find out the effect of the treatment of the abnormal gait by using SOT category II, III method and the therapeutic electrical stimulation. The SOT category II, III method improves the evaluative indices of the abnormal gait, especially antalgic gait positively. The overall effective rate of the SOT category II, III and the therapeutic electrical stimulation on the abnormal gait is about 92.5%.

Key words abnormal gait, antalgic gait, sacral occipital technique (SOT), therapeutic electrical stimulation, kinetic chain, biomechanical balance

Introduction

The great leader Comrade **Kim Jong Il** said as follows.

“The development of curative and preventive work and success in medical services depend largely on how advanced methods of diagnosis and treatment are adopted.”(“ON THE FURTHER IMPROVEMENT OF THE HEALTH SERVICE” P.12)

Recently many patients are suffering from pain of the kinetic chain such as the lumbar, shoulder girdle, knees, and the rest of the body, and especially prolonged antalgic gait can affect the serve normal movement.

For example, an ankle pain can lead to low-back one, and low-back pain can affect the serve normal gait [3, 6, 7, 10].

Category II condition can result from a postural problem and cause imbalances of muscles in foot, ankle, knee, hip as well as shoulder and neck, and so on. The category II condition is musculoskeletal imbalance affecting the entire body, not just the back. When the SI (sacral iliac) joint is unstable, the muscles above and below of the pelvis contract to compensate. Category III is a result of the body's failure to adapt to the category II, and category III is often associated with sciatic radiation down the posterior leg, antalgic, numbness, muscular weakness, severe pain and spasm. The asymmetrical tension on the lumbar muscle, shoulder girdle, knees, and the rest of the body causes abnormal gait [5, 7–10]. Therefore it is necessary for us to find out more effective

methods that can be applied to prevent and treat prolonged antalgic gait suffering from pain of the kinetic chain.

There are various conservative treatments such as pharmacotherapy heat and cold therapy, traction therapy, acupuncture, manipulation, electrical stimulation and so on for the treatment of the pain [1, 10].

At present Sacral Occipital Technique is well recognized as one kind of chiropractic technique not only adjusting imbalance of spinal nerve, muscle and bone but also reduction of the pain in kinetic chain, which contains the adjustment of pelvis by blocking [2, 4, 8].

We established antalgic gait due to pain of kinetic chain and have studied to find out the changes of the evaluative indices of the gait and the effect of the treatment of the abnormal gait by using (SOT) category II, III method and the Therapeutic Electrical Stimulation.

1. Research Object and Research Method

1.1. Research object

We have treated 70 patients suffering from the antalgic gait in the rehabilitation department, the Pyongyang Medical College Hospital of **Kim Il Sung** University, from March to November in 2013. Among the patients male and female were 41 cases (58.5%) and 29 cases (41.5%) respectively, and 40 to 60-year old cases were 61 cases (87.1%).

1.2. Research method

First, we have studied to find out the changes of the evaluative indices of the gait and the subjective symptoms. In order to collect the clinic data to treat the cases with abnormal gait we have applied the SOT category II, III method and the evaluative indices of the gait such as width of the base, average length of a step and average number of a step.

Also we have studied to find out the effect of the treatment of the abnormal gait by using SOT category II, III method and the therapeutic electrical stimulation.

For the study group, we have applied the SOT category II, III method the therapeutic electrical stimulation and have applied above methods simultaneously. The SOT category II, III method is in the manner described in “Sacral Occipital Technique Participant Guide” by SORSI [7].

Otherwise, for the control group we have applied therapeutic electrical stimulation.

1.3. Instruments

Block, digital therapy machine or other kinds of electrical stimulation devices are utilized. Treatment is applied once a day or other day and 1 course has over 7 days.

1.4. Indicators of observation

We have applied subjective symptoms such as low back pain, leg pain, and pain during walking and objective symptoms such as width of the base, average length of a step and average number of a step.

As instrument examinations we have applied EMG (velocity on conduction of peripheral nerve).

1.5. Criteria to treatment

Cured means subjective and objective symptoms have been disappeared and there are remarkable improvements in the instrument examination, effect means there remain pains in walking but no pains in the rest, while there are improvements in the instrument examination and no effect means there remain all symptoms and no improvements in the instrument examination.

2. Results and Discussion

2.1. Changes in the evaluative indices of the gait and the subjective symptoms by using the SOT category II, III method

2.1.1. Changes in the width of the base

Table 1. Changes in the width of the base(cm)

Group	Before treatment	After treatment		
		5d	10d	15d
Category II group($n=30$)	15.6 ± 0.3	13.1 ± 0.6	11.6 ± 1.0	$9.9^*\pm0.5$
Category III group($n=40$)	17.5 ± 0.6	15.9 ± 1.20	$15.0^*\pm1.32$	$13.9^{**}\pm0.2$

$n=70$, * $p<0.05$ (compare with before treatment), ** $p<0.05$ (compare with category III group)

Table 1 shows that the width of the base has been significantly improved in the category II group and category III group and category II group is better than category III group by $(9.9\pm0.5)\text{cm}$ and $(13.9\pm0.2)\text{cm}$ respectively ($p<0.05$).

2.1.2. Changes in the average length of a step

Table 2. Changes in the average length of a step(cm)

Group	Before treatment	After treatment		
		5d	10d	15d
Category II group($n=30$)	27.8 ± 1.3	29.9 ± 1.5	30.9 ± 1.9	$33.9^*\pm0.9$
Category III group($n=40$)	22.5 ± 0.8	23.4 ± 1.7	$25.9^*\pm1.5$	$26.9^{**}\pm1.2$

$n=70$, * $p<0.05$ (compare with before treatment), ** $p<0.05$ (compare with category III group)

As shown in table 2, the average length of a step in both group has been significantly improved after treatment compared with before one and category II group is better than category III group respectively ($p<0.05$).

2.1.3. Changes in the average number of a step

Table 3. Changes in the average number of a step(step)

Group	Before treatment	After treatment		
		5d	10d	15d
Category II group($n=30$)	70.8 ± 2.4	79.9 ± 3.5	87.9 ± 2.1	$112.9^*\pm0.9$
Category III group($n=40$)	62.5 ± 1.8	68.4 ± 1.7	$73.9^*\pm1.2$	$90.9^{**}\pm1.2$

* $n=70$, $p<0.05$ (compare with before treatment), ** $p<0.05$ (compare with category III group)

As shown in table 3, the average number of a step in both group has been significantly improved after treatment compared with before one and category II group is better than category III group respectively ($p<0.05$).

2.1.4. Changes in the subjective symptoms

Table 4. Changes in the subjective symptoms

Symptoms			Low back pain	Leg pain	Pain during walking
Category III group(n=40)	Before treatment		40	28	31
	After treatment	Cured	16	10	10
		Effect	15	14	15
		No effect	9	6	6
	Effective rate/%		77.5	78.6	80.6
Category II group(n=30)	Before treatment		28	24	26
	After treatment	Cured	20	14	10
		Effect	8	8	11
		No effect	2	2	6
	Effective rate/%		93.3	91.7	80.7

Comparing with category III group and category II group, table 4 shows that the effective rate in the study group category II group is better than category III group on the subjective symptoms such as low back pain, leg pain, and pain during walking after treatment than before (table 4).

2.2. The effect of the SOT category II, III and the therapeutic electrical stimulation on the abnormal gait

2.2.1. Changes of the subjective symptoms and the evaluative indices of the gait

Not only the subjective symptoms, especially pain, in the study group is better than the control group but also the evaluative indices of the gait such as width of the base, average length of a step and average number of a step are better than one.

2.2.2. Changes in velocity on conduction of the peripheral motor

Table 5. Changes in velocity on conduction of the peripheral motor(mV/s)

Group	Side of healthy	Side of illness	
		Before treatment	After treatment
Control group No.2 (n=20)	47.96 ±1.22	40.25±1.03	43.53*±0.96
Study group (n=20)	47.64 ± 1.26	41.01±0.68	46.57** ±1.01

* $p < 0.05$: (compare with before treatment), ** $p < 0.05$ (compare with control group)

As shown in table 5, the velocities on conduction of the peripheral motor in the study group have been more significantly improved after treatment compared with before one ($p < 0.05$).

2.2.3. General results

As shown in table 6, the overall effective rates in the control group and the study group are 73.3% and 92.5% respectively.

Table 6. General results

Group		Control group(n=30)	Study group(n=40)
Before treatment		30	40
After treatment	Cured	3	19
	Effect	19	18
	No effect	8	3
Effective rate/%		73.3	92.5

Conclusion

First, the SOT category II, III method improves the evaluative indices of the abnormal gait, especially antalgic gait positively.

Second, the abnormal gait (antalgic gait) is improved by using the SOT category II, III and the therapeutic electrical stimulation significantly, and the overall effective rate is 92.5%.

References

- [1] 원동진; 척추질환의 림상, 백과사전출판사, 259~290, 주체99(2010).
- [2] S. L. Oleski et al.; the Journal of Craniomandibular Practice, 20, 1, 34, 2002.
- [3] M. G. Rosen et al.; Today's Chiropractic, 32, 4, 22, 2003.
- [4] C. L. Blum et al.; Journal of Chiropractic Education, 20, 1, 51, 2006.
- [5] C. L. Blum; Journal of Chiropractic Education, 18, 1, 38, 2004.
- [6] R. Cooperstein et al.; Journal of the American Chiropractic Association, 41, 1, 44, 2004.
- [7] M. B. Dejarnette; Sacro Occipital Technic1984, Privately Published, NE, 103, 193, 233, 1984.
- [8] C. L. Blum et al.; Journal of Chiropractic Education, 19, 1, 45, 2005.
- [9] G. Knutson; Journal of the American Chiropractic Association 41, 8, 32, 2004.
- [10] R. Walter et al.; Physical Medicine & Rehabilitation, 55, 121, 1953, 2010.