

Original Article

The effect of SSP therapy on elderly nursing home residents' chronic constipation

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Abstract. [Purpose] The aim of the present study is to examine the effects of silver spike point therapy on elderly persons' chronic constipation. [Subjects and Methods] The subjects of the present study were 30 elderly chronic-constipation sufferers who resided in a nursing home and had other physical conditions that necessitated wheelchair ambulation. There were three test groups in the present study: an silver spike point group, an acupuncture group, and a control group; 10 subjects were assigned to each group. The silver spike point group and the acupuncture group received their respective interventions, which were applied to both sides of the Tiansu for 20 minutes per day, five days per week, over a four week period. Weekly bowel movement frequency was recorded, and the Constipation Assessment Scale and Bowel Function Assessment Form were used as data-gathering instruments. [Results] Following treatment, the silver spike point and acupuncture groups showed significant improvement, based on the Constipation Assessment Scale and the Bowel Function Assessment Form, compared with the control group. [Conclusion] Based on the above results, silver spike point therapy can be administered to alleviate chronic constipation in elderly nursing home residents who cannot walk independently due to declining physical functions.

Key words: Constipation, Elder, Silver spike point therapy

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INTRODUCTION

Approximately 50% of elderly populations residing in nursing homes suffer from chronic constipation¹⁾. Constipation is when a person has fewer than three bowel movements per week^{1, 2)}. Although there are treatments for constipation, including drugs, biofeedback, and surgery^{1, 2)}, these often cause unwanted complications or are of limited effectiveness²⁾. Recent studies have indicated that electro-acupuncture and acupuncture therapies are effective treatments for chronic constipation²⁾. Both electro-acupuncture and acupuncture therapies entail inserting needles into the surface of the body to stimulate bodily functions.

Silver spike point (SSP) therapy is similar to acupuncture therapy and is commonly used in physical therapy settings. It is a noninvasive, needless treatment in which low frequency current stimulates the surfaces of acupuncture points. It can be used with patients who are hypersensitive to needles and is advantageous in that it is not known to cause any side-effects or complications³⁾. In previous studies⁴⁻⁶⁾, SSP therapy has

proved effective at treating joint and physiological dysfunctions and pain control, Koo⁷⁾ recently showed SSP therapy was more effective than the consumption of dietary fiber alone at alleviating constipation in patients in their 20s.

In this study, therefore, sought to expand upon these previous findings by administering SSP therapy as a treatment for the chronic constipation of elderly nursing home residents with conditions that necessitated wheelchair ambulation. The purpose of this study was to determine if SSP improved the conditions of these constipation patients in the hopes of helping to develop physical therapy intervention methods effective at alleviating constipation.

SUBJECTS AND METHODS

This study's sample consisted of 30 elderly chronic constipation sufferers who had scored at least 20 points on a Korean version of mini mental state exam (K-MMSE)⁸⁾ and were also suffering conditions that necessitated wheelchair ambulation. The subjects were 65 years of age or older and resided in an elder-care nursing home located in Yongin-Si, Gyeonggi-do. The study's protocol was approved by the local ethics committee at the Namseoul University of Cheonan. When the study subjects were selected, those experiencing digestive system lesions, skin disease, abdominal wounds, or paralysis due to a neurological disorder were excluded. The study was explained to each subject and subject's legal guardian, and only those who agreed to participate were

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Table 1. General characteristics of subjects

Variable	Silver spike pont goup	Acupunc-ture group	Control group
Age (yr)	83.9 ± 5.4	83.5 ± 7.7	85.0 ± 6.2
Gender	Male	2	2
	Female	8	8
K-MMSE (score)	22.4 ± 1.1	22.2 ± 1.0	21.6 ± 0.8
Weight (kg)	43.9 ± 3.5	40.8 ± 3.3	40.9 ± 3.9
Period of wheelchair (month)	25.6 ± 21.4	35.6 ± 30.9	29.9 ± 25.7
Active daily living (score)	11.3 ± 1.8	11.4 ± 2.1	10.8 ± 1.6
Frequency of meal (day)	3.0 ± 0.0	3.0 ± 0.0	3.0 ± 0.0
Meal type (frequency)	Rice	6	7
	Gruel	4	3
	Thin gruel	0	0
Bristol stool form scale (type)	Lumpy	5	4
	Normal	5	6
	Loose	0	0
Onset of constipation (yr)	3.9 ± 2.8	5.1 ± 3.4	3.1 ± 2.0

Values are shown as the mean±SD

K-MMSE: Korean Version of Mini Mental State Examination

selected. This study strictly abided by the ethical guidelines of the Helsinki Declaration. The general characteristics of the study's subjects are listed in Table 1.

The study's subjects were then randomly divided into three groups: an SSP group, an acupuncture group, and a control group. The SSP and acupuncture groups received their respective treatments on both sides of their Tiansu (ST25) while in the supine position, as this had previously proved effective when using the aforementioned treatments to alleviate constipation^{2, 9}. A Dynaroshiftor DS-3004 (Asahidenshi, Japan) was used to administer treatment to patients in the SSP group. As per Koo's study⁷, the device's stimulation intensity level was set to 1 Hz, its phase to 70 μ s, and its electrode's adsorptive power (vacuum) to 200 mmHg. SSP therapy was administered to each patient for 20 minutes per session, five times per week, over a four week period. As the Dynaroshiftor DS-3004's intensity had been adjusted to a range of 10–25 mA, stimulation intensity was such that no visible muscle contractions occurred. The acupuncture group received acupuncture treatments administered by licensed oriental-medicine doctors for 20 minutes per session, five times per week, over a four-week period, and the control group did not receive any form of treatment.

As for data collection, weekly bowel movement frequency, bowel movement form, degree of constipation, and bowel function were recorded for each study subject. Bowel movement form was classified according to the following types, based on the Bristol stool form scale: lumpy, normal, and loose¹⁰. Degree of constipation was determined using the Constipation Assessment Scale (CAS)¹¹ and bowel function was determined using the Bowel Function Assessment Form (BFAF)¹². These surveys were administered to the study's subjects in person by a nurse. The CAS consists of eight questions whose answers are measured on three

Table 2. Effects of constipation symptoms on each treatment methods

Variable	Group	Before	After
Bowel frequency of week (frequency)	Silver spike pont goup	1.7 ± 0.1	2.1 ± 0.1
	Acupuncture group	1.6 ± 0.1	2.0 ± 0.1 [†]
	Control group	1.7 ± 0.1	1.8 ± 0.1
Constipation assessment scale (score)	Silver spike pont goup	8.0 ± 0.6	5.6 ± 0.7 ^{†‡}
	Acupuncture group	7.9 ± 0.4	5.9 ± 0.6 ^{†‡}
	Control group	7.2 ± 0.5	7.2 ± 0.4
Bowel function assessment form (score)	Silver spike pont goup	25.1 ± 0.9	23.2 ± 0.4 ^{†‡}
	Acupuncture group	25.5 ± 0.8	24.0 ± 0.7 ^{†‡}
	Control group	23.9 ± 0.6	23.5 ± 0.6

Values are shown as the mean±SE, *p<0.05

[†]Significant difference between before and after the intervention within group (p<0.05).

[‡]Significant difference between the treatment groups and control group (p<0.05)

point scales, with higher scores equating to higher degrees of constipation. The BFAF consists of 12 questions whose answers are also measured on three point scales, with higher scores equating to poorer intestinal function.

All the collected data were coded and analyzed using the statistical analysis program SPSS WIN (ver. 21). The general characteristics of the study's subjects were analyzed using descriptive statistics, and their homogeneity was confirmed using an χ^2 -test. The results of these preliminary tests showed there was no significant difference between the groups. Data from the subject groups' pre and post treatment measurements were then compared using Wilcoxon signed-rank tests. Finally, Kruskal-Wallis H tests were used to analyze changes in pre and post treatment measurements within each individual group. The statistical significance level was set at $\alpha=0.05$.

RESULTS

Following their respective treatments, the SSP group experienced the most significant reduction of constipation symptoms, based on data from the CAS and BFAF questionnaires. The acupuncture group's symptoms were also significantly reduced, based on the BFW, CAS, and BFAF ($p < 0.05$), while members of the control group reported no change to their symptoms. With regards to the differences in treatment effects among the groups, compared with the control group the SSP and acupuncture groups exhibited significant constipation alleviation according to these patient's answers to the CAS and BFAF ($p < 0.05$) (Table 2).

DISCUSSION

In addition to simple inconvenience, constipation can result in pain and other serious problems, such as drug abuse¹³. In particular, immobility and no exercise significantly associated with constipation¹⁴. Because all the participants in this study were reliant on wheelchairs for basic mobility and had low ADL abilities, their other medical conditions were

thought to have adversely affected their chronic constipation. In this study, after respective treatments, the SSP group showed significant condition improvement in according to their CAS and BFAF and the acupuncture group showed significant improvement in all of BFW, CAS, and BFAF ($p < 0.05$). The SSP group and the acupuncture group showed significantly greater improvement in CAS and BFAF compared to the control group ($p < 0.05$), and there was no significant difference in the results between the SSP group and the acupuncture group.

ST25, which was used as an SSP point in the present study, is an acupuncture point^{2, 9)} that is connected to the brain's processing network and regularly figures into constipation and functional diarrhea treatments^{2, 9)}. As a result, stimulating this point with SSP, the present study's authors reasoned, would reduce chronic constipation in elderly persons living in wheelchairs. Moreover, a review of previous studies on using acupuncture therapy to treat constipation also indicated that stimulating ST25 with SSP would effectively reduce constipation^{2, 15)}.

For instance, Koo⁷⁾ reported that, after six weeks of receiving SSP to both sides of ST25, Gihaesu (BL24), Taejangsu (BL25), and Kwanwonsu (BL26), constipated patients in their 20s experienced decreases in their left and right, rectosigmoid colon, and total colon transit times, and their CAS responses evinced more significant improvement compared with the responses of those who only increased their dietary fiber intake. Similarly, another study also showed that CAS responses improved after patients' S2–S3 were stimulated with low – frequency current¹⁶⁾. Although many studies on the use of acupuncture in treating constipation exist, studies of SSP therapy are currently quite rare. Therefore, the results of the present study cannot be easily compared with those of others. That said, the present study's results do show that stimulating ST25 with SSP is an effective means of reducing constipation.

Furthermore, although the present study's subjects were treated in the supine position, one advantage of SSP therapy is it can be implemented simultaneously with exercise because the body can move freely during treatment³⁾. Immobile persons 2.5 times higher risks of constipation compared to mobile persons¹⁴⁾. Further research on SSP therapy should examine whether implementing this type of therapy concurrently with exercise¹⁷⁾ is effective at improving intestinal motility.

Our study has limitations as the colon transit time of bowel movements could not be measured to prevent physical side effects on elderly persons due to many times of radiography in a short time and drugs that were currently taken could not be controlled. However, this study is meaningful in that reductions in constipation symptoms were shown using reliable measurement methods. Moreover, these reductions were the result of SSP therapy, which proved excellent at

alleviating elderly persons' constipation.

Through this study, it could be seen that SSP therapy can be utilized as an intervention for improvement of constipation of elderly nursing home residents with declined physical functions and chronic constipation.

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