

# Clinical Report (2nd)

## Analysis of Questionnaire after the Application of The Air Inflated Lumber Corset (Disk Dr.)

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### Introduction

Lumbago (low back pain) is the condition of disease that is experienced at least once in life by 80% of the adult population, regardless of age, sex and occupation. Many of low back pain symptoms develop into chronic lumbago.

Treatment of lumbago usually begins with rest, anti-inflammatory, muscle relaxing medication, a spinal brace or physical therapy. Some patients, if serious, have a surgery. Diseases, including herniated disc, spondylolisthesis, tuberculosis of spine, ankylosing spondylitis, etc. In most diseases, according to research results, use of the corset was effective in decreasing pain by 30~80%. However, the air inflated lumber corset (Disk Dr.), which has been developed recently, was found excellent or good in pain relief in 18 cases out of 22 clinical experiments. The purpose of this paper was to discover the efficacy of the air inflated lumber corset (Disk Dr.) on pain relief. To do this, a questionnaire survey was conducted with patients who had used the air inflated lumber corset to appear their back pain.

### Subjects and Methodology

#### 1. Subjects

When air inflated lumber corset, brand name Disk Dr.® manufactured by Changeui Medical Co., Ltd., patients were asked to answer for the questions of the enclosed questionnaire on their own after using the air inflated lumber corset and to return the self-reported questionnaire to the researcher. Of the returned questionnaires, 328 who had answered to questions faithfully were used for this study.

#### 2. Methodology

##### Questionnaire

The questionnaire was composed of five sections: general information about subjects; the type and duration of low back pain; the name of diagnosed disease & previous case history; the pain decreasing effect of the air inflated lumbar corset, etc. The section of general information about subjects included questions about age, sex, height, weight, etc.

The section of the type and duration of low back pain included questions about when low back pain started, how long it persisted and how characteristics of it was. To judge characteristics of low back pain, subjects were asked to make marks by pain type (e.g., sharp pain, numbness, abnormal sensitivity) on the part they felt pain over the picture of a human body.

Questions about the name of diagnosed disease and previous case history were whether subjects received a special test or medical examination in the past, whether they had a physical therapy or took medication, how effects of therapy were, or whether they were asked to have a surgery.

Questions regarding the pain decreasing effect of the air inflated lumbar corset were about the motivation of using the air inflated lumbar corset of Changeui Medical(the Disk Dr.®maker), the degree of pain relief, and whether subjects would recommend the corset to others,, etc.

### ▪ Statistical Analysis

SPSSWIN program was used for analyzing data.General information about the subjects was first grasped. Then, the frequency and percentage of pain duration, characteristics of low back pain, the name of diagnosed disease, the motivation of usage of corset, the wearing time of corset and the duration of the pain decreasing effect after wearing corset were presented

The \*test was conducted for general information about the subjects, characteristics of low back pain and the pain decreasing effect of the corset by diagnosed disease.

Both the \*trend test and linear association were performed for age to see correlation between age and the pain decreasing effect. The pain decreasing effect

between previous physical therapy & medication and wearing the air injected lumbar corset was compared in graphs.

### ▣ Conclusion

General information about the subjects, e.g., sex and age, is provided in Table 1.Of 328 subjects who marked their sex and age, men were 191(58.2%)and woman 137(41.8%).In the range of age, men in their 30s were 61 (31.9%), the largest number and men in their 40s 52 (27.2%) & men in their 50s 28 (14.7%). Men from their 30s to 50s were all 141(73.8%). Woman in their 40s were 46 (33.6%), the largest percentage, women in their 50s 33 (24.1%) and women in their 30s and 60s were 22(16.1%),equally. On the whole, the number of subjects in their 40s was the highest with 98 (29.9%),followed by those in their 30s with 83 (25.3%) and in their 50s with 61 (18.6%). As a whole, the average height and the average weight were 166.3 \* 5.74\*and 63.8\*6.94\*.By sex, the average height was 171.12 \* 5.64\*for men and 159.84\*4.37\*for woman .While, the average weight was 68.32 \*7.44\* for men and 57.45\* 6.53\* for women (Table1).

⊕ **Table 1 .Number of subjects by age and sex**

Age	Male	Female	Total
~ 29	17 (9.4)	10 (7.2)	27 (8.6)
30 ~ 39	61 (32.5)	22 (16.6)	83 (25.4)
40 ~ 49	52 (27.2)	46 (34.5)	98 (32.9)
50 ~ 59	28 (15.4)	33 (24.6)	61 (19.5)
60 ~ 69	25 (13.8)	22 (16.3)	47 (14.9)
70 ~	8 (4.2)	4 (3.3)	12 (3.8)
<b>Total</b>	<b>191 (100)</b>	<b>137 (100)</b>	<b>328 (100)</b>

For the question about the type, duration and the starting time of low back pain,171(52.2%) answered they had suffered from chronic pain for over 3 years . 69 subjects (21.0%) had suffered for 1 year –3 years,42 (12.8%) for less than 0.5 year and 41 (12.5%)for 0.5 yrs –1 year .For the question about the frequency and duration of pain ,99 (30.2%) answered they had always suffered from pain ,79(24.1%) sometimes and 55(16.8%) only at moving times . 82 subjects (24.9%) said that pain subsided when they lay down.

For characteristics of pain , 146(44.5%) had back pain with radiating pain to buttocks and thighs , 65 (19.8%) back pain with extended pain to legs and heels ,58 (17.7%) only back pain and 28(8.5%) only leg pain .The largest number complained of radiating pain (Table2).

With regard to the name of diagnosed disease and case history ,287 out of the total 328 subjects,87.5% ,have their back pain examined in hospital . Of them ,250 (76.2%) had close examination , including computed tomography (C.T).

Of the total subjects, 264(80.5%) knew about the definite name of their diagnosed diseases , while 64 (19.5%) were receiving treatment without knowing about their disease. This finding requests doctors that they should provide more explanation on disease to patients. Herniated disc was mentioned by 190 subjects S.D : Standard deviation (72.0%) as the name of diagnosed disease , forming the highest percentage. Spondylolisthesis was mentioned by 19(7.2%), spinal stenosis by 18(6.8%) and back sprain and sciatica by 5 (1.9%), equally.

⊕ **Table 2.Duration, frequency and characteristics of the back pain.**

Duration		Frequency		Characteristics	
Less than 0.5yr	42(12.8)	Sometimes	79(24.1)	Only back pain	58(17.7)
0.5yr-1yr	41(12.5)	Always	99(30.2)	Back pain with radiating pain to buttock and	146(44.5)
1yr-3yrs	69(21.0)	Pain at moving times	55(16.8)	Back pain with total legs	65(19.8)
3yrs and over	171(52.5)	subside when lie down	82(24.9)	Only leg pain	28(8.5)
No response	5(1.5)	No response	13(4.0)	No response	31(9.5)
<b>Total</b>	<b>328(100)</b>	<b>Total</b>	<b>328(100)</b>	<b>Total</b>	<b>328(100)</b>

Of the total subjects, 302 (92.1%) received physical therapy or medication in the past,108 (35.8%) only in hospital of 302 ,60 (19.9%) in hospital and oriental hospital and 42 (13.9%) only in oriental hospital. A few subjects received treatment from chiropractors, massagers , etc.

For motivation of usage of the air inflated lumbar corset , most subjects received information about the product from newspapers. 168 (51.2%) wore the corset for 12 hours a day, 55 (16.8%) for 6 hours and 53 (16.2%)for over 18 hours. The number of subjects wearing the corset for over 20 hours a day was 245, 74.7%. As to complaints about the corset , the particulars , which had been pointed out , were the thickness of the corset was put on ,discomfort by contact of the air injection hole with skin , stiffness by the tight corset (Table 3), etc.

As to the effect of previous treatment and medication on pain relief , 208(63.4%) answered they had at least a little effect of physical therapy or medication .190 (57.9%) said they had a little effect , while 18 (5.5%)had a good effect . The number of subjects who had a little effect from past treatment took 91.3% (190/208),However ,297 or 903.5% of the total subjects who used the air inflated lumbar corset answered they found effect in decreasing low back pain .Of the total subjects ,96(29.3%) had a little effect from wearing the corset in pain relief. This figure forms 32.3%(96/297) out of the total subjects who experienced effect in pain reduction . The number of subjects who had good and excellent pain decreasing effect and even cured the pain by wearing the air inflated lumbar corset was 201(61.3%) , forming 67.7% (201/297)

of the total subjects who experienced effect in pain relief. This shows that wearing the air inflated lumbar corset was far more effective qualitatively and quantitatively in decreasing pain than physical therapy or medication (Figures 1 and 2).

⊕ **Table 3. Wearing time and motivation of usage of the air inflated lumbar corset(Disk Dr.)**

Wearing time		Motivation	
About 3 hours	18(5.5)	Announcement of newspapers	206(62.8)
About 6 hours	55(16.8)	Inducement by acquaintance	84(25.6)
About 12 hours	168(51.2)	Announcement of televisions	4(1.2)
About 18 hours	53(16.2)	Inducement by doctors	3(0.9)
All day long	24(7.3)	Others	8(2.4)
No response	10(3.0)	No response	23(7.1)
<b>Total</b>	<b>328(100)</b>		<b>328(100)</b>

The efficacy of the air inflated lumbar corset on pain reduction differed according to the age group. That is, the higher age group showed the higher pain decreasing effect. This was statistically significant (\*trend = 5.08 p=0.025). By the pain type, subjects who found efficacy of the air inflated lumbar corset on abating radiating pain formed 93.7%, subjects who somatic pain 94.1%, while subjects who had efficacy on decreasing psychosomatic pain formed just 68.6%. Though the pain decreasing effect differed among pain types, their difference was not significant statistically. Difference in the pain decreasing effect of wearing the air inflated lumbar corset by sex, obesity and the name of diagnosed disease was not significant statistically, either. For the question of recommending the air inflated lumbar corset to others, 289 (88.1%) said 'yes', which was a very high percentage.

## Discussion

Lumbago is one of the most common disease in the industrialized society. It is also a serious socioeconomic problem because it produces medical expense and the labor loss from absence or leave of lumbago sufferers. Unfortunately, it is hard to find out its causes because it is attributed to too many factors, such as mechanical, visceral and psychogenic factors, and it is usually caused by complex factors. In association with occupation, it is mostly caused when lifting heavy things. It is also caused by repetition of minor symptoms, driving for over 4 hours a day, incorrect working posture and vibration of the total body. Its prognosis has not yet been discovered clearly, either. Once lumbago gets into chronic pain, it becomes a disease by itself. Patients describe their pain very subjectively, so lumbago diagnosed by a thorough examination, including the starting time and frequency, occupation-related things, previous case history, pain spot & characteristics, existence of radiating pain, etc. Chronic lumbago can be hardly cured by one remedy. It is treated by complex treatment means, including a rest, medication physical therapy, a brace, psychological therapy, etc. Above all, wearing the air inflated lumbar corset was found very effective in restricting excessive physical movements and reducing the overload to the lumbar vertebrae or muscle around the lumbar vertebrae.

Of the subjects who participated in this study, 90.5% answered that they experienced pain reduction by wearing the air inflated lumbar corset. This figure is very high compared with Ahlgren's report, in which 30~80% of corset wearers experienced the pain decreasing effect. It is of course very hard to compare

and analyze the degree of lumbago accurately because lumbago is described by purely subjective symptoms and thus there is no way to objectize the degree of lumbago. Nonetheless, the efficacy of the air inflated lumbar corset can be acknowledged in that the percentage of subjects who found the pain decreasing effect of the air inflated lumbar corset was far higher than the percentage (63.4%), of those who had pain reduction from previous medication or physical therapy. The fact that about 75% of the subjects wore the air inflated lumbar corset for over 12 hours implies the excellent efficacy of the corset. A previous study reported that wearing the air inflated lumbar corset contributed to muscular strength of the extensor at the lumbar vertebrae. This report proves that the air inflated lumbar corset boosts muscular strength, contrary to the fact that general spinal braces could weaken muscular strength around the waist. However, this finding needs to be confirmed by following studies in the future.

The pain decreasing effect of the air inflated lumbar corset was more effective with older patients. This is deemed to be related to the report<sup>3</sup>) about the increased forward flexion (bending forward) at the lumbar vertebrae by wearing the air inflated lumbar corset. That is, this finding is in accord with McKenzie's report<sup>4</sup>), asserting that the symptom of kyphosis rises at older ages, thus older people complain of lumbago, the correction of this symptom helps decrease low back pain and exercises boosting muscle strength & extension help reduce radiating pain.

In most pain clinics in Korea, more than half of patients suffer from low back pain. Most of them are old patients suffering from degenerative disease, such as degenerative arthritis or spondylopathy, herniated disc, etc. From the finding of this study about the higher pain decreasing effect of the air inflated lumbar corset among older people, the corset is assumed to carry out the auxiliary role in abating chronic low back pain effectively.

## Conclusion

This study was conducted with 328 subjects who answered faithfully for questions of the self-reported questionnaire distributed to patients when they bought the air inflated lumbar corsets.

Of these 328 subjects with the application of the air inflated lumbar corset, 171 (52.2%) suffered from low back pain for over 3 years, and 211 (64.3%) had low back pain and radiating pain (sharp pain or numbness) on the legs. Of the total subjects, 264 (80.5%) knew the exact name of their diseases, and herniated disc was the largest with 190 (72.0%) among the diagnosed disease.

208 (63.4%) of the total subjects answered that past physical therapy and medication were effective in abating pain, while 297 (90.5%) said that the air inflated lumbar corset was helpful in pain relief. Of the total subjects, 201 (61.3%) said that the pain decreasing effect of the air inflated lumbar corset was more than good, and 13 (4.0%) answered that their pain was almost cured.

The average corset wearing time of 74.7% of the total subjects was over 12 hours, which proved that wearing the air injected lumbar corset did not bother daily life and was helpful in reducing pain. 88.1% of the total subjects answered that they would recommend the air inflated lumbar corset to others, which shows their satisfaction with the corset in pain relief. It was also found that the pain decreasing effect of wearing the air injected lumbar corset was higher as the subjects were older.

## References

- Yeong -Tae Kim. The significance of lumbar muscle extension of herniated disc. Red - hot medical Science. 1990;33(8):35-50.
- A Ueyoshi and Y Shima. Studies on spinal braces with special reference to the effects of increased abdominal pressure. International Orthopedics. 1985;9:255-8.

- Byung–Jick Kim M.D.and Sin–Woo Park M.D. The efficacy of air corset (Disk Dr.)to lumbago patients. Inje medical journal .1996;17(2):199–203.
- Geon–Yeong Lee and Seung –Han Lee. The factor type of Lumbago of the Korean peasantry. A Collection Of Leared Papers of Catholic College of Medicine .1990;43(1):55–62.
- Walsh K. , Varnes N. , Osmand C. ,Styles R. and Coggon D .Occupational causes of low back pain . Scand .J. Work. Environ .Health . 1989;15:54–9.
- Biering –Sorensen F .A prospective study of low back pain .Scand . J. Rehab .Med.1983;15:81–96 .
- Hun Choi . Lumbago and the treatment of lumbago. An Article Of Korea Pain Society. 1990;3 (1):4–10.
- Lantz SA and Schultz AB .Lumbar spine orthosis wearing I , II spine II .1986:834–842.
- Ahlgren SA , Hansen T. The use of lumbosacral corsets prescribed for low back pain .Prosthet Orthot Int .1978;2:101–4.
- McKenzie , R .Treat your own back.4th Ed. spinal publications Ltd . Waikanae , New Zealand. 1985.

#### Abstract

## Analysis of Questionnaire after the application of The Air Inflated Lumbar Corset (Disk Dr.)

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Analysis of the returned Questionnaire after application of the air inflated lumbar corset (Disk Dr.) was out in 328 patients .Of the 328 patients , 171 patients (52.2%) suffered from low back pain for more than 3 years and 211 patients (64.3%) suffered from radiating pain with low back pain . After the application of the brace,297 patients (90.5%) reported more than some relief of low back .

The mean duration of application was more than 12 hours in a day in 74.7% of the patients. This means that Disk Dr .is comfortable on application relatively and the pain relief is promising .

There were some tendency that the pain relief was higher with the increae of the age of the patients .

Of the 328 patients ,88.1% of the patients reported that they would recommand the Disk Dr. to other person.