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Inversion Therapy & Zero Gravity Concept: For All Back Pain Problems

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ABSTRACT: *From the moment we are born, and throughout our lifetime, we fight a constant battle against a downward compressive force of nature the force known as gravity. Some negative effects of gravity effects on spine due to compression which causes back pain and many other problems related to spine such as Herniation of disc, Sciatica, Scoliosis etc. to overcome these, Inversion therapy and Zero gravity position concept can be used. Inversion therapy performs gravity traction on spine to shoot back pain likewise Zero gravity position neutralize gravity pressure on spine it gives many health benefits.*

Keywords: *Back pain, Compression, Gravity, Inversion, Spine.*

I. INTRODUCTION

Backache and sciatica due to protuberant disc disease is a major cause of lost working days and health expenditure. Surgery is a well-established option in the management flowchart. There is no strong evidence proving that surgery for sciatica is effective [1]. Degenerative lumbar disease is a major cause of disability and health expenditure, especially in the industrialized world [2] [3]. Compression on Nerve root causes mostly Back pain and other complicated spine diseases like Herniation Disc, Scoliosis, Sciatica, Spinal stenosis etc. Nowadays on these problems two types of treatments existing, 1. Surgical Treatment and 2.Non-Surgical treatment .Most of the time surgical treatments often fails to eliminate complications, [4] even after treatment problems like herniation disc arises after some period although it is costly treatment. Some non-surgical treatments reduce pain but not disabilities. [5] That's why there is need of alternative remedies to cure these spine problems. Inversion and Zero gravity concept can give all remedial benefits of spine and other Health benefits in single set up. Inversion therapy is good alternative for spine related disease it is proved by some medical studies. Inversion therapy can accomplish by Inversion table, The inversion condition cause gravitational pressure to be placed on the nerve roots, resulting in shooting pains in the back, buttocks, legs and feet. During inversion therapy, you turn your body upside down to increase the space and reduce pressure between the vertebrae and nerve roots, it gives decompression to the spine so that the problems of Back pain which arise due to compression, will be solved. In Zero gravity position, this also known as weightlessness position sitting position is such that the leg position is slightly higher than heart position. The posture the body takes in the zero-gravity position neutralizes the effects of gravity and allows for proper heart, back, and leg alignment

II. INVERSION THERAPY:

Inversion is used for our health benefits from Ancient times. In 3000 BC the human use Yoga inversion poses it shows on the first drawings discovered by Archaeologist .they use value of inverted poses of body to re-balance body, to increase blood circulations, stimulate brain, relives pressure on abdominal organ. In 400 BC The Father of Medicine, Hippocrates hoists up a patient on ladder with ropes and pulley to harness the force gravity in an effort to stretch patient and relieve their ailments.

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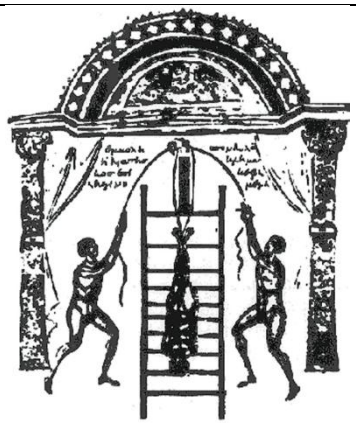

Fig.1: Yoga inversion poses first drawings discovered by Archaeologist in 3000 BC

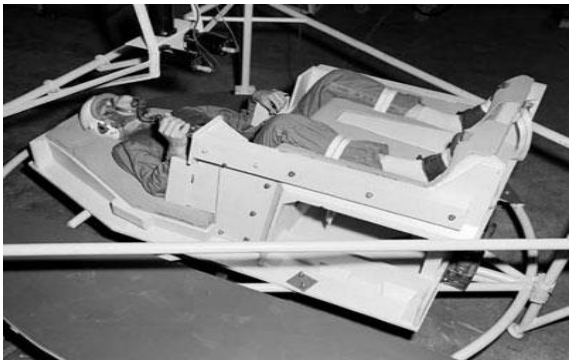

Fig.2: An astronaut sits in a spacecraft simulator in the zero-gravity position. Courtesy NASA

Inversion therapy is used to cure back pain caused by degenerative or herniated discs, spinal stenosis or other spinal conditions. The inversion condition cause gravitational pressure to be placed on the nerve roots, resulting in shooting pains in the back, buttocks, legs and feet. During inversion therapy, you turn your body upside down to increase the space and reduce pressure between the vertebrae and nerve roots.
Inversion Table is an adjustable platform which allows positioning in an upright or inverted position in order to allow the effects of gravity to meet requirements to cure the disorders related to spine. Frederick Sheffield designed a tilt table with a highly-polished slippery top on which the patient was attached by a pelvic harness. By tilting the table head down or inverted.

The efficiency and benefits from inversion define a broad spectrum of patients and conditions. Patients who present with numerous conditions such as herniated or bulging discs, sciatica, spondylolisthesis, scoliosis, muscle spasm and even lymphedema, can benefit from inversion. Inversion therapy can result in a reduction of pain, realignment of the vertebrae, rehydration of the intervertebral discs, relaxation of the muscles and reduction of recovery time. In addition to these direct benefits, the use of inversion also has been shown to stimulate venous return and the lymphatic system; stimulate the autonomic nervous system and its bar receptors; increase oxygen flow to the brain; help maintain our original body shape and avoid prolapsed internal organs; help maintain correct posture; and contribute to overall general good health.[1]

1.2. Zero gravity concept (Weightlessness):

Zero gravity position concept is taken from the technology developed by NASA for astronauts. Scientific research had shown that the zero-gravity position minimizes the huge gravitational stresses astronauts experience during takeoff. Today, doctors, occupational therapists, and other health professionals recommend this position because of its health benefits to everyone. The posture the body takes in the zero-gravity position neutralizes the effects of gravity and allows for proper heart, back, and leg alignment. Zero gravity doesn't means that zero gravity act on it, it is minimum gravitational stress act on spine and body .this also termed as weightlessness position since at that position person feel weightless and more comfortable. In this position feet are elevated so knee higher position than Heart so this position reduced stress on Heart.

2. Health Benefits:

2.1 Inversion therapy helps to cure following back problems

1. Scoliosis: It is medical condition in which a person's Spine is curved from side to side.[17]

Fig.3:Scoliosis

fig.4:X-ray view of Scoliosis

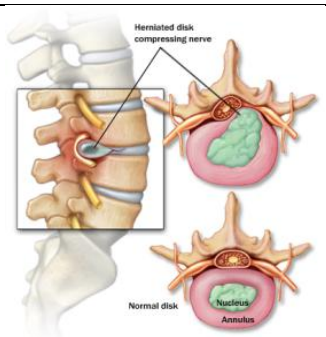

Fig.5:Herniatation of disc

2.Herniation Disc or Slip Disc: It is a medical condition affecting the spine in nucleus pulpous which act as cushion for shock absorption is bulging out beyond damaged outer ring of vertebrae. 'Slipped disc' used to describe a low back injury. Disc does not actually slip. Rather, they may herniated or bulge out from between the bones. A herniation is displaced fragment of the centre part of the disc that is pushed through a tear in the outer layers or annulus of the disc. Pain results when irritating substance are released from tear and also if the fragment touches or compress a nearby nerve. Disc herniation has some similarities to degenerative disc disease and disc that herniate are often in an early stages of degeneration. Herniation disc common in the low back or lumbar spine. [17]

3.Sciatica: It is pain caused by compression or irritation of five spinal nerve roots of each sciatica nerve. It causes lower back pain ,leg pain,buttock pain or weakness in various parts of leg.[17]

2.2 Inversion therapy also helps to:
Decrease:
Back pain.
Compression on discs.
Nerves Muscle pain.
Spasm Stress.
Tension Unwanted effects of ageing.
Increases:
Blood Circulation
Lymph drainage
Relaxation of muscles
Mobility of the spine
Joint mobility and Flexibility

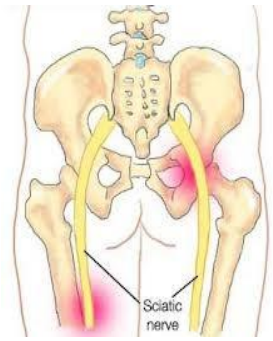

Fig .6: sciatica affected positions

2.3 Zero gravity position helps:
Zero-gravity takes pressure away from the vertebrae's discs.
It eliminates muscle tension in the lower back.
Enlarges the lung capacity.
It also reduces stress on the heart because our feet are elevated.

Raises blood oxygen levels and circulation.
Eliminates back pain.

III. MEDICAL STUDIES

1. One area of concern for today's patients, health-care providers and payers is the avoidance of surgery. The cost of back surgery is staggering in dollars and cents as well as lost time on the job, not to mention the percentage of failed surgeries that can compound the problem for both the patient and the physician.[1] In 1987 there were 14 million paid sick-days for low back pain (LBP) in Sweden, a nation with million inhabitants. However, 70% of the sick-periods were shorter than 10 days. Out of 6600 filed workers compensations claims in 1988, 4100 were due to LBP. An estimated 15% of all sick-days in USA in early 1980s were due to LBP. Obviously LBP is problem of major proportions for society and industry.[5][7]
2. A preliminary study, from Newcastle Hospital, shows evidence that regular use of an inversion table may significantly reduce the need for back surgery. In this study, patients who were told that they needed surgery to relieve sciatica were divided into two groups. One group regularly practiced inversion along with traditional physical therapy, while the other group received physical therapy only. The results showed that the patients in the inversion group were 70.5 per cent less likely to require surgery.[8]
3. The Sheffield /Volvo study 175 patients who were unable to work due to back pain were treated. After eight inversion treatments, 155 patients were able to return to their jobs full time. Study concluded that the main basis for improvement was the stretching of paraspinal vertebral muscles and ligaments and possibly the widening of intervertebral discs. Study found significant improvements in a variety of diagnosis including spondylolisthesis, herniated discs, lumbar osteoarthritis with sciatica, and coccygodynia. Patient experienced traction in a modified hip flexed position. It is worth noting that previous to his use of inversion therapy, Dr. Sheffield regularly used mechanical traction with weights and pulleys. He considered inverted traction much more effective than mechanical traction. [9]
4. Noss study found EMG activity (an indicator of muscle pain) reduce by 35% within the first 10 seconds of inversion also found that it increases the spinal length, and there is relation in EMG activity and an increase in spinal length. [10]
5.Nachemson study measured internal disc pressure (in 3rd lumber disc) through various daily activities like standing, sitting, bending, and vertical spine traction.[6][7]
6. Kane .M. et . Study found gravity-facilitated traction (inversion) generates intervertibral separation in lumber spine and it helps in back pain related problems. [11]
7. Dimberg conducted Experimentation in which he was enrolled 116 people in the randomized controlled trial which lasted for 12 months. A randomized controlled trial with two training groups and one control group was conducted to assess the effect of gravity inversion on pain level and absenteeism due to LBP. Average age = 44 years. 77% men Group 1: used inversion for 10 minutes 1/day Group 2: used inversion for 10 minutes 2/day Group 3: control group Results after 12 months of training program: 1. The employees in Group 1 and 2 decreased sick days due to back pain by 33%. 2. Average sick days to due back pain fell by 8 days per individual in the treated group. 3. "Inversion is an efficient and cheap way to improve employee health and possibly reduce sick day costs to the employer."[12][13]
8. Gianakopoulos study found all subjects experienced intervertibral separation of lower lumbar vertebrae .study conclude that although mechanical traction has been used for centuries but only gravity-assisted traction(inversion) offers an effective for back problems.[16]. Many soldiers use inversion table to help recover from brutal workouts & stenous conditions.

IV. CONCLUSION

Inversion traction therapy would reduce the need for a surgical procedure in subjects with sciatica and other back problem; it gives the alternate way of treatment. The results of these medical studies do sup- port this; surgery was avoided and many back problems reduced due to use of inversion therapy. Zero gravity position also has many health benefits for human body. So it concludes that Inversion therapy & Zero gravity concept is an alternate and effective approach towards Back pain problems.

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