A Comparative Study on Effect of IFT and Conventional Exercises Versus ICT And Conventional Exercises in Cervical Spondylosis

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Abstract

Background And Purpose:-Cervical spondylosis is a chronic degenerative condition of the cervical spine that affects the vertebral bodies and intervertebral discs of the neck. IFT and ICT are used in patients with cervical spondylosis. The purpose of this study is to compare the effects of IFT and ICT in patients with cervical spondylosis.

Methods:-30 patients with cervical spondylosis were divided into group A and group B.

Group A patients were given IFT plus conventional exercises while group B patients were given ICT plus conventional exercises. Pain (visual analogue scale) were recorded before and after the treatment

Conclusion:-When the results were analyzed using "T- test" it shows that there is significant effect of IFT plus conventional exercises on pain compared to ICT plus conventional exercises.

Keywords:- *IFT, ICT, Cervical spondylosis, Visual analogue scale*

Introduction

Cervical spondylosis is a common and occasionally disabling condition, occurring as a natural Consequence of aging in the vast majority of the adult population.[1]The goal of treatment is to relieve pain and prevent permanent injury to the spinal cord and nerves.

Various treatments for cervical spondylosis available are:-[2]

Treatment of mild cases: - Neck brace

- Nonsteroidal anti-inflammatory drugs (Advil, Motrin, others)

- Exercises

Treatment of more serious cases: - bed rest and traction

- Muscle relaxants (methocarbamol)

- Injecting corticosteroid medications into the joint

If conservative treatment fails or if your neurological signs and symptoms, such as weakness in your arms or legs, are getting worse, you may need surgery. Indications for surgery include intractable pain, progressive neurologic deficits, and documented compression of nerve roots or of the spinal cord that leads to progressive symptoms.[3]

Many treatments are available to patients and accepted as standard forms of practice, including such common conservative strategies as medication, physical medicine methods, manual treatments, and education of patients. There is little evidence, however, for their accepted use.[4,5]

Common physical therapy treatments for cervical spondylosis are: [6]

1. Physical agents &Massage: - hydro collator packs and infrared

- Short wave diathermy, microwave and ultrasound

- Ice- massage, Ice packs, TENS, IFT

- Effleurage, Circular Kneading & Friction

2. Exercises – Isometric Neck Exercises and Shoulder Scapular Exercises to Strengthen the Muscles.

3. Cervical Traction: - Various studies have shown that cervical traction may relieve the symptoms of spondylosis. Traction on the spine can be applied manually or mechanically.

4. Manipulation: - Reduction of intra-articular displacement in cervical Spondylosis by Manipulation is very effective.

5. Cervical Collar

6. Postural and ergonomic advice.

Effects of traction: Various studies have reported the benefits of traction. (Cailliet, 1988; Harris, 1977; Matthews, 1972: pellechia, 1994; saunders, 1985)

Traction has the mechanical benefits of temporarily separating the vertebrae and causing mechanical sliding of the facet joints in the spine. If done intermittently, this motion may help reduce circulatory congestion and relieve pressure on the dura, blood vessels, and nerve roots in the intervertebral foramina. Improving circulation of noxious chemical irritants from swelling and inflammation. Traction has been demonstrated to widen the intervertebral foramina. Traction may relieve symptoms from a disc protrusion

Positioning the spine in flexion prior to the application of traction provides the greatest increased space.(Cailliet, 1988; Harris, 1977; Matthews, 1972; pellechia, 1994)

Effect of IFT:-Various studies have reported the benefits of IFT. (Hans Nemec, Kloth 1987) A good number of recentstudies (e.g. Hurley et al 2004, Johnson and Tabasam 2003, Walkeret al 2006, McManus et al 2006, Jorge et al 2006) provide substantive evidence for a pain relief effect of IFT.

It is the form of electric current in which 2 medium frequency currents with slight change in frequency willinterference with each other produces current which have low frequency and effect like medium Frequency. This medium frequency current will pass more easily than low frequency because lower skin resistance is offered, to medium frequency current.

Mechanism of action of IFT

Higher frequencies (100-130H2) close the pain gate mechanisms and thereby reduce the painPerception. IFT may act directly on peripheral nerves by slowing the conduction, which in turn reduces the volume of nociceptor traffic. Electrical Stimulation also reaches the cerebral cortex in the sense that the patient is aware of a prickling or tingling sensation. This may contribute to the placebo effect.

There are 4 main clinical applications for which IFT appears to be used: Pain relief, Muscle stimulation, increased local blood flow and Reduction of edema

There is little information available from randomized clinical trials to support various approaches for treating neck pain.[7, 8]

So the purpose of the present study is:-

- To study the effects of IFT and Conventional Exercises on Pain in patients with Cervical Spondylosis

- To study the effect of ICT and Conventional Exercises on Pain in patients with Cervical Spondylosis.

- To compare the effect of IFT and Conventional Exercises Versus ICT and Conventional Exercises on Pain in patients with Cervical Spondylosis.

Methodology

Ø **Study design**: - Comparative Study design.

Ø **Duration of study:-** 6 months

Ø **Duration of treatment**:- 10 days

Ø **Study setting**: - This study was conducted at Govt. Physiotherapy College, Paraplegia Hospital Civil Hospital Campus, Ahmedabad. All the patients were referred from Orthopedic outpatient Department, Civil Hospital, Ahmedabad.

Ø **Sample size**:- Group A 15

- Group B 15

Ø **Study sampling: -**30 patients of Cervical Spondylosis were selected by simple, purposive Random sampling on the basis of inclusion and exclusion criteria.

Group A- IFT and Conventional Exercises.

Group B- ICT and Conventional Exercises.

Ø **Inclusion criteria:**

- Patients Diagnosed with Cervical Spondylosis by medically qualified orthopedic doctors
- Age:-25 to 50 years
- Willingness to participate

Ø **Exclusion Criteria:-**

- Patients with cord compressions
- Patients with spinal tumors, infection
- Previous spinal surgery
- Very old age
- Patients with spondylolisthesis, PIVD
- Recent motor vehicle accident involving cervical spine
- History of psychological or psychiatric illness

Ø **Materials:**

- Examination table
- Consent form
- Visual Analogous Scale sheet
- Pencil, papers and recording sheets, assessment charts.
- ICT machine
- IFT machine
- Chair

Ø **Procedures**

- Selection of subjects has done by simple purposive random sampling. A total of 30 subjects were selected for the study and assigned to either control or study group. All subjects who matched the inclusion criteria were selected after giving informed consent to the study. Standardized evaluation protocol is used and management given.
- Group A was treated with IFT & conventional exercises, ergonomic advice. Group B was treated with ICT & conventional exercises. Both groups were recorded for their pain intensity by Visual analogue scale. Then the gathered data is tabulated and interpreted.

Ø **Protocol:-**

Group-A – IFT

- Isometric Neck Exercises
- Shoulder Scapular Exercises
- Neck Care

Group-B- ICT

- Isometric Neck Exercises
- Shoulder Scapular Exercises
- Neck Care

Ø **Technique of IFT**

- Position of Patient: - Comfortable sitting Position
- 4 carbon rubber electrodes are used with conducting gel
- Placement of Electrodes – 2 electrodes at

the shoulder girdle level & 2 electrodes at the area of radiating pain.

Parameters: - 4 pole 90 vector

- Spectrum – 80-120 Hz

- Base – 80

- Sweep- 40

- Intensity- as tolerable

- Duration – 15 minutes for 10 days

Precautions:-

- Skin resistance must be decreased by washing skin before treatment

- Skin sensation should be checked.

- Bare metal electrode or their connection should not touch the skin

- SWD can interfere with delicate balance of IFT machine hence the machine is operated well away from diathermy at least at a distance of 6 meters.

Ø Technique of ICT:

Position of patient: Supine or sitting. Traction in supine produces better relaxation, greater intervertebral separation, decreased muscle guarding and increased stability

Traction force: vary between 1/10 and 1/7 of the patient's body weight At least 10-15b force is required initially for vertebral separation

Duration of traction: 10-15 minutes for 10 days

Angle of pull of traction

Traction in flexion: - maximum pull and vertebral separationoccurs at lower cervical spine. Studies shows that vertical diameter of C5-C6 vertebral foramen increased by 1.5 mm at 20 degrees if flexion

Traction in neutral: - maximum pull and vertebral separation occurs at mid cervical spine

Traction in hyperextension: - maximum pull and vertebral separation occurs at upper cervical spine

Exercises -isometric neck exercises and shoulder scapular exercises. 10 repetitions per one session with 10 sec hold for 10 days.

OUTCOME MEASURES

Pre & post Visual Analogue Scale were assessed before the treatment and after 10 days of the treatment.

Results

In this study 30 patients of cervical spondylosis were taken.

Results of the study are as under.

TABLE- 1 PAIRED t- TEST:

Comparison of pretreatment and post treatment values of pain within GROUP A and GROUP B

		Mean	SD	t- Value	P value and level of significance
GROUP A	Pre test	7.54	1.00	19.38	p>0.05
	Post test	2.54			
GROUP B	Pre test	7.67	1.24	13.71	p>0.05
	Post test	3.27			

(A) PAIRED TEST

GROUP-A:

When the pre-treatment and post treatment values of pain within GROUP A are analyzed by paired "t test at 5% level of significance. The calculated value is 19.38, which is greater than the table value of 2.15 for 14 degrees of freedom Thus NULL HYPOTHESES is rejected.

GROUP B:

When the pretreatment and post treatment values of pain with in GROUP are analyzed by paired test at 5% level of significance. The calculated value is 13.71, which is greater than the table value of 2.15 for 14 degrees of freedom. ThusNULL HYPOTHESES is rejected.

INTERPRETATION:

There is significance difference of pretreatment and post treatment values of pain in patients receiving IFT andCONVENTIONAL EXERCISES.

There is significance difference of pretreatment and post treatment values of pain in patients receiving ICT and CONVENTIONAL EXERCISES.

TABLE- 2 UNPAIRED t- TEST

Comparison of mean values of pain between GROUP A and GROUP B

GROUP	Mean	SD	t- Value	P value and level of significance
A	5	0.71	2.06	p>0.05
B	4.4	0.88		

(B) UNPAIRED t TEST:

When the difference of pre-treatment & post treatment values of pain within GROUP A & GROUP B are analyzed by independent t-test at 5% level of significance. The calculated value is 2.06 which is greater than the table value of 2.05 at 28 degrees of freedom. Thus NULL HYPOTHESES is rejected.

Interpretation:

There is significance difference of pretest& post values of pain existing between the individual receiving IFT and CONVENTIONAL EXERCISES and the individual receiving ICT & CONVENTIONAL EXERCISES.

Discussion

Cervical spondylosis is a progressive degenerative disorder exacerbated by a history of poor lifestyle or health. It is now common for many people to work at a computer or watch TV for too long with resulting damage to the muscles, tendons and bones, leading to this disease.

Schmori and junghanns report upon finding in autopsies of 4253 spines found evidence of spondylosis in 60% of women and 80% of men by the age of 49 years. He found 95% incidence in both sexes at age 70 years. Significant structural changes in the disk have been reported in most studies of pathologic disks in patients past the age of 30-35 years.[9]

Spondylosis is a term applied to changes noted in the spine of radio logically significant (1) narrowing of the disk height (2) presence of osteophytes arising from the disk margin (3) osteoarthritis changes in the posterior Zygapophysical joints.[9]

In this study sample size is 30. Group A were treated with IFT & Conventional Exercises. Group B were treated with ICT & Conventional Exercises.IFT

and ICT both are effective in the treatment of cervical spondylosis.While comparing the mean values of group A and group B (Mean-group A- 5, group B- 44) there is significant difference existing between the two groups. Thus, making the mean values into consideration it can be concluded that Interferential therapy shows more significant improvement than intermittent cervical traction.

It is important to find the most effective treatment programs to treat cervical spondylosis.IFT is the form of electric current in which 2 medium frequency currents with slight change in frequency will interference with each other produces current which have low frequency, and effect likemedium frequency.[10, 11]

A good number of numerous studies (e.g. Hurley et al 2004, Johnson and Tabasam 2003, Walker et al 2006, McManus et al 2006, Jorge et al 2006, Partan et al 1953, Scott and purves, 1991, Stephenson and Johnson 1995) provide substantive evidence for a pain relief effect of IFT.

Higher frequencies (100-130H) close the pain gate mechanisms (Meizack and Wall) and thereby redace the pain perception. It may act directly on peripheral nerves by slowing the conduction, which in tum reduces the volume of nociceptor traffic. Electrical Stimulation also reaches the cerebral cortex in the sense that the patient is aware of a prickling or tingling sensation This may contribute to the placebo effect.

Various studies have reported the benefits of traction. (Cailliet, 1988, Ham, 1977; Matthew 1972 pellechia, 1994; Saunders, 1998)

1. Cervical traction cause gentle mobilization of the Zygoapophyseal joints and may cause analgesic effect by stimulating mechanoreceptors. Mechanoreceptor impulses arriving in theSpinal cord may tend to inhibit recognition of nociceptive impulses, resulting in some degree of analgesis.

2. Cervical traction causes stretching of the small neck muscles and this increases relaxation and reduces pain.Isometric exercises are equally important in both the methods of treatment Alternating isometric contractions between antagonists also enhance stability.[12]

The Benefits of Neck isometric exercises, which helps in cervical spondylosis.

- Improvement in the static strength.

- Relaxation of the muscles, which provides better posture to work

IFT was more effective in pain reduction due to radicular pain than cervical traction As we have used 4pole 90 vector, it will cover large area so it will be more beneficial in patients because pain will radiate to the hand.IFT directly stimulate the mechanoreceptors so according to the pain gate theory it relieves pain faster than cervical traction.

Most of the authors says that electrotherapeutic modalities like IFT & ICT are effective only temporarily. Exercises are the main reason for the improvement and will provide long term effect. Neck care and ergonomic advice is also a useful tool to reduce the recurrence rate of neck pain. A small pillow under the neck enhances relaxation and thus reduces pain.

Conclusion

IFT along with conventional exercises & ICT along with conventional exercises both are highly efficient in relieving symptoms of cervical spondylosis on VASScores on individual basis.

But comparatively IFT along with conventional exercises is more effective than ICT & Conventional exercises as there is significant difference found between the results of these two treatments.

Limitation Of The Study

- The small sample size of 15 in each group (group A & group B) may limit generalization the results of this study to all the patients with cervical spondylosis.

- Long term follow up was not done

- Isometric neck exercise at home was not supervised.

- Cervical range of motion was not taken.

SUGGESSION

- It can also be done with larger sample size in both the groups to find out the effectiveness of IFT & ICT

- I would like to recommend that the future study to conduct and find out how long IFT &ICT effect lasts for and whether it is relieving pain or not.

Ethical Clearance: - Taken from Ethical committee

Source of Funding: - Self

Conflict of Interest: - Nil

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