TO STUDY THE EFFICACY OF PULSED RADIO FREQUENCY COMBINED WITH TRANSFORAMINAL EPIDURAL STEROID AND TRANSFORAMINAL EPIDURAL STEROID ALONE FOR CHRONIC LUMBOSACRAL RADICULAR PAIN - A RANDOMIZED COMPARATIVE STUDY

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INTRODUCTION

Chronic lumbosacral radicular pain (CLR) is a major public health issue worldwide and has the prevalence of 9.9% to 25%. Traditionally inter laminar epidural steroid is given for management of CLR. Transforaminal epidural steroid injection (TFESI) is given under fluoroscopy guidance by pain physicians. Pulsed radio frequency neuromodulation of dorsal root ganglion (PRF of DRG)has been a new treatment modality in patients not responding to conservative management. There are very few studies which are conducted to compare the efficacy of combined TFESI + PRF of the DRG with TFESI alone for CLR pain.

OBJECTIVES

- **Primary Objective**
- To measure the **intensity of pain** using NRS score
- **Secondary Objectives**
- To assess **functional status** as measured by the Modified Oswestry Disability Index (MODI)
- To assess **patient satisfaction** through Global Perceived Index scale.

At pre-procedure, immediate post procedure and at the intervals of 2, 4 and 12 weeks

- To assess the **incidence of surgery** for CLR during follow up period & observe the complication associated with the procedure.

MATERIALS AND METHODS

After the approval of Hospital Ethical committee, 20 patients visiting the Pain clinic of JSS Medical College Hospital, Mysuru, India were selected based on inclusion and exclusion criteria after taking informed and written consent.

- **Inclusion criteria :**
- 18 to 70 years of either gender,
- Low back pain with unilateral radiculopathy >3 months,
- NRS $\geq$ 4
- Pain refractory to conservative treatment
- MRI evidence involving up to 2 lumbar levels
- **Exclusion criteria:**
- Patients with coagulopathy or on anticoagulants
- Infection at the site of injection
- Presence of cancer as a cause of back pain
- History of previous back surgery
- Pregnancy or lactating women

Study patients were divided into 2 groups, Group T and Group TR based on the type of intervention done.

GROUP T : TFESI

GROUP TR : DRG PRF + TFESI

PROCEDURE: Under fluoroscopy guidance, with patient in prone position, needle was inserted in oblique view at the target vertebra by sub-pedicular approach. 8cm long, 22G Quincke's spinal needle was used for Group T and 10 cm long, 22G, 5mm curved active tip radiofrequency needle was used for Group TR. In lateral view needle was advanced to reach anterior superior quadrant of intervertebral foramen. Final needle position was confirmed using dye.

GROUP T:
1.5 ml of 1% preservative free Lidocaine + 4mg of Dexamethasone in 1ml with a total volume of 2.5ml injected after negative aspiration.

GROUP TR :
RF probe connected to RF generator was inserted through the needle. With impedance <500Ω, DRG was stimulated with sensory stimulation between 0.3 to 0.5 V at 50Hz, and motor stimulation 1.5 to 2 times > than sensory threshold at 2Hz.
PRF neuromodulation done at 42°C for 300 seconds followed by injection of 1.5 ml of 1% preservative free Lidocaine + 4mg of Dexamethasone in 1ml with a total volume of 2.5ml after negative aspiration.

PARAMETERS ASSESSED

The following parameters were assessed in both the groups at pre-procedure, immediate post procedure and at 2, 4, 12 weeks.

- **Numerical Rating Scale (NRS)-** 11 point scale.
0: No pain,1- 3: Mild pain, 4- 6: Moderate pain, 7-10 : Severe pain.

- **Modified Oswestry Disability Index (MODI Score)-**To assess functional status

Modified ODI score (%)	Level of disability
0–20	Minimal disability
21–40	Moderate disability
41–60	Severe disability
61–80	Cripple, pain impinges on all aspects of patient's life
81–100	Patients are bed-bound or exaggerating their symptoms

Global Perceived Index- To assess patient satisfaction..
Unsatisfied: GPI $\leq$ 4 symptoms not changed or worse,
Satisfied: 4 < GPI $\leq$ 5, symptoms improved,
Very satisfied: GPI $\geq$6 , symptoms improved distinctly or patients recovered

RESULTS

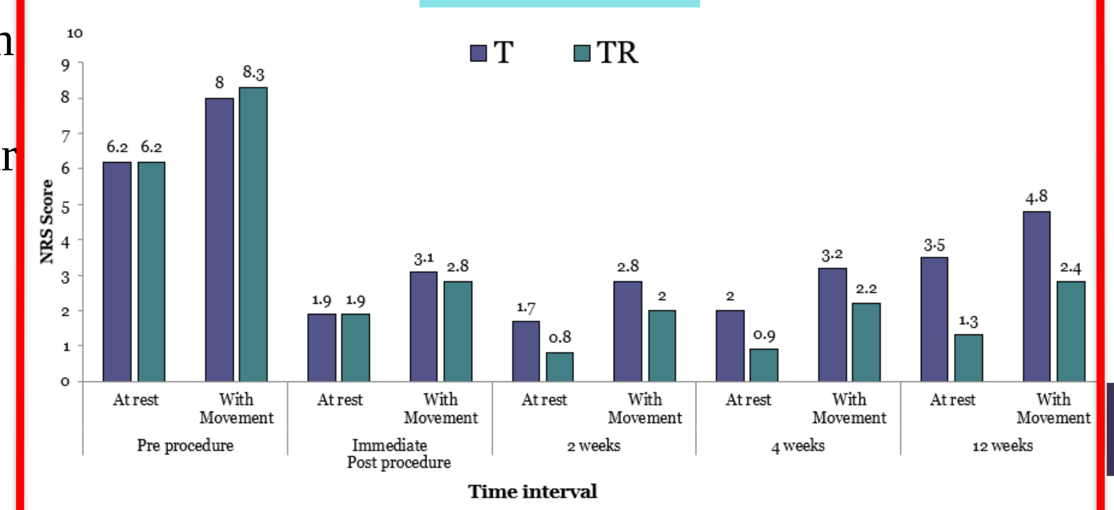

Figure 1: NRS Score

Reduction in NRS score: Group TR > Group T at all time intervals and it is statistically significant at rest as well as with movements at 4 and 12 weeks (p<0.05)

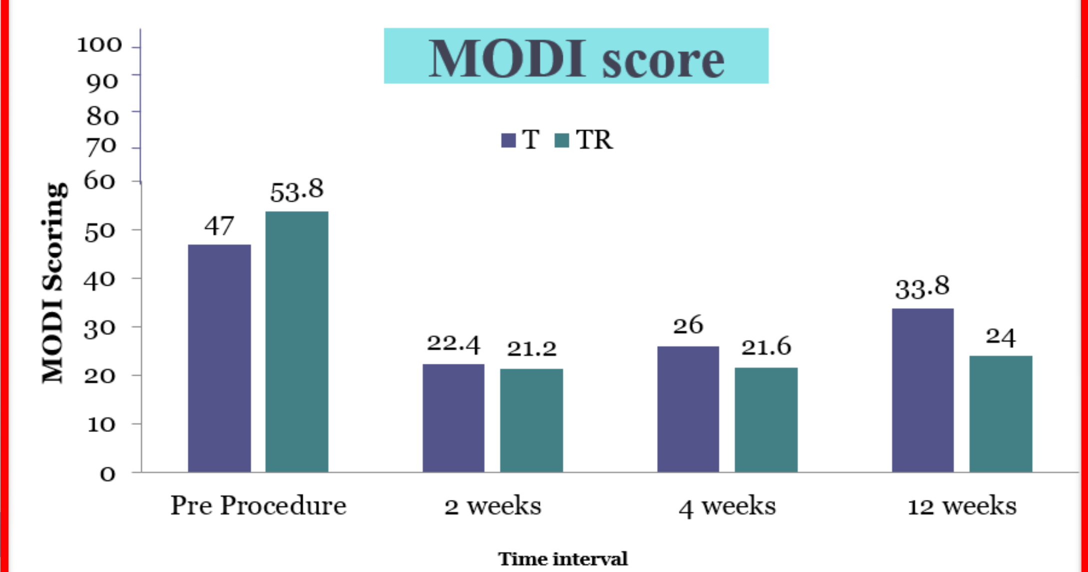

Figure 2: MODI Score

Reduction in ODI: Group TR > Group T in all time intervals though it is not statistically significant.

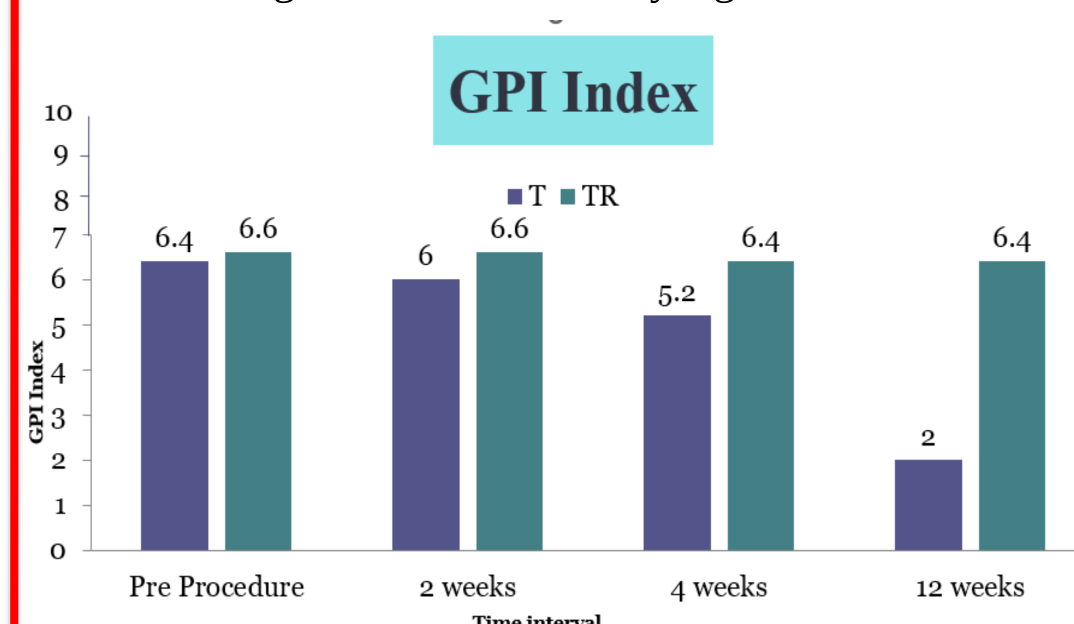

Figure 3: GPI

Increase in the GPI score : Group TR > Group T at all time intervals and it is statistically significant at 4weeks (p=0.035) and 12 weeks (p=0.001)

- None of the patients underwent surgery and no complications were associated with the procedure.

STATISTICAL ANALYSIS

This is a randomized comparative study. Data was entered in MS Excel and analyzed using SPSS 21.0 version software. Mann-Whitney U-Test is done to compare between two groups at different time intervals. Friedman test followed by Dunn-Bonferroni post hoc analysis was performed between different time intervals among each group . Chi square test was done for qualitative data. P value < 0.005 was considered as statistically significant.

DISCUSSION

CLR is one of the leading causes of years lived with disability .Conservative therapy remains first line of management. Several surgical and non-surgical treatment options are available .With surgery, trauma is significant , recovery is slow and it might cause complications. Minimally invasive interventional therapy has been widely used in the treatment of CLR with varying success rate. In TEFSI, steroids exert anti-inflammatory and immunosuppressive effects . In DRG- PRF neuromodulation creates intense electrical field which induces changes in gene expression in the dorsal horn of the spinal cord. The rapidly alternating current alters pain transmission by activation of the protein called C-Fos.
In the present study there was reduction of pain with both the groups. However, at 12 weeks significant reduction in NRS score in Group TR > Group T with increase in GPI score (p< 0.05). In Group TR ,TFESI combined with PRF showed rapid onset of pain relief with prolonged maintenance achieving a long-term analgesic effect. The overall efficacy was superior to that of the single method treatment.

CONCLUSION

Pulsed radio frequency neuromodulation of dorsal root ganglion combined with transforaminal epidural steroid is safe and effective technique in the management of CLR with good outcome.

LIMITATIONS

Small sample size, Short term follow up, Single center study are the limitations of the study.

REFERENCES

1. Manish De, Virendra K M, Boi D, Talawar P, Kumar A, Garg B et al. A comparison of Transforaminal Epidural Steroid Injection Of Local Anaesthesia and Dorsal Root Ganglion Pulsed Radiofrequency Treatment In Lumbar Radicular Pain: a randomized, controlled, Triple –blind trial. Journal of Pain Practice. 2019;20(2): 12840
2. 2.Shanthanna H , Chan P, Mc Chensey J, Thabane L, Paul J. Radiofrequency treatment of the lumbar dorsal root ganglion in patients with chronic lumbar radicular pain: a randomized , placebo controlled pilot study. Journal of pain research. 2014;7:47-55