



## COMPARING THE EFFECTS OF PELVIC FLOOR EXERCISES WITH CORE STRENGTHENING EXERCISES IN WOMEN WITH LOW BACK PAIN AFTER NORMAL LABOUR

M.S. Sundaram<sup>\*1</sup> and M. Manju<sup>2</sup>

<sup>\*1</sup>Professor, School of Physiotherapy, VISTAS (Vels University), Thalambur, off OMR, near Navalur, Chennai-600130.

<sup>2</sup>P.G Student, SOPT, VISTAS (Vels University), Thalambur, off OMR, near Navalur, Chennai-600130.

\*Corresponding Author Email: [sundaram.sp@velsuniv.ac.in](mailto:sundaram.sp@velsuniv.ac.in)

### ABSTRACT

**Aim:** To compare the effects of pelvic floor exercises with core strengthening exercises and determine which is more effective in reducing low back pain in women after normal labour. **Method:** An experimental study of convenient sampling method was conducted with sample size 20 SVD (Spontaneous vaginal Delivery) subjects with mechanical low back pain, aged 23-35 years with normal BMI. They were assigned to two groups. Group A- (Core Strengthening) (n = 10) and Group B-Pelvic Floor Exercise (n= 10) . VAS (Visual Analogue Scale), Oswestry low back pain disability questionnaire & Dynamic abdominal muscle endurance test were taken as outcome measures. **Results:** Pre and post-test mean value tables shows that both the groups were effective in reducing pain, improving endurance and functional status but Group-A with core strengthening shows better improvement in functional status, endurance and reduction in pain than Group-B with pelvic floor exercises. **Conclusion:** Both the pelvic floor exercise and core strengthening exercise were found to be effective in reducing pain, disability, and improving the abdominal muscle endurance. However, the subjects treated with core strengthening exercise showed more significant benefits in terms of reduction of pain, disability and improvement in abdominal muscle endurance in treatment of Low Back Pain in women after normal labour.

### KEY WORDS

Core strengthening, Dynamic abdominal muscle endurance test, Low Back Pain, Muscle endurance, Pelvic Floor Exercises.

### INTRODUCTION

Pregnancy related low back pain is a frustrating health problem because of its high prevalence during pregnancy and the clinical belief that it could lead to long lasting pain and disability after delivery. Backache often persist after delivery and may last up to one year or more in certain cases due to severe damage to musculoskeletal anatomy which can be reversed only through appropriate treatment.

Pregnancy comes with number of physiological changes in musculoskeletal, hormonal, biomechanical and

vascular system. The main cause is due to increase in size of uterus which weakens and stretches the core abdominal muscle which is due to the effect of hormone relaxin which affects the stability of joint and shortening of spinal extensors in lumbar region and hip flexors due to posterior shift of body weight as these changes persist even after pregnancy there is prevalence of low back pain after pregnancy.

Another cause of back pain after normal labour may be due to extensive damage to pelvic floor which are

strained, stretched and teared during labour. As pelvic floor supports the spine by stabilizing it and unloading spine weakening of pelvic floor muscles causes back pain.

The classical hypothesis of low back pain postulates that weight gain during pregnancy women unconsciously shift their head and upper body posteriorly over the pelvic inducing hyperlordosis of the lumbar. This leads to postural changes and persistence of this changes and pain even after delivery increases the sensitivity to movement.

Low back pain can potentially have a negative impact on quality of life. So, this study aims at reducing the back pain and predicting whether the low back pain is due to weakened core muscles or pelvic floor muscles which are extensively stretched after delivery and thus reduce its impact on women quality of life.

As is in the upcoming generation who tend to live a sedentary lifestyle have a very poor knowledge about the importance of exercises after labour. During pregnancy as there is tremendous change in the musculature which weakens the structure further leads to complications like low back pain which persist even after delivery and cause severe limitation or impact on functional status of women restricting from performing the activities with ease.

Since there is limited evidence for the comparison of pelvic floor and core exercises for low back pain in women after normal labour. This study was focused on implementing the importance of exercise after pregnancy and how it can help in preventing from persistent pain or chronic low back pain due to pregnancy.

Thus, this study was done to determine whether pelvic floor exercises or core strengthening exercise is effective in reducing low back pain and increasing the functional status and abdominal muscle endurance in women after normal labour.

#### **MATERIALS AND METHODS:**

An experimental study of convenient sampling method was conducted with sample size 20 SVD (Spontaneous vaginal Delivery) subjects with mechanical low back pain, aged 23-35 years with normal BMI. They were assigned to two groups. Group A- (Core Strengthening) (n = 10) and Group B-Pelvic Floor Exercise (n= 10). Home based study was conducted. Among the 20 subjects 10 subjects were assigned to follow core exercises and

other 10 subjects were assigned to follow pelvic floor exercises. Both the groups were concentrated on reducing pain and improving the quality of life. Inclusion Criteria: - Female subjects with Low Back Pain of duration more than three months, Age group: 25-35 years, Women who had normal labour, Patients free from any diseases which causes low back pain confirmed by X-ray, Women with BMI of 30-35, Number of parity not more than 2 times (normal delivery). Low Back Pain within one year after delivery. Exclusion Criteria: - Obstetric complications preventing exercise eg. diastasis recti, dystocia, Other pathology of the spinal column eg. neurological deficit, spondylolysis, spondylolisthesis, spinal fracture, spinal surgery, scoliosis, acute disc prolapsed, Patients under any medications, Patients who are taking other specific treatment for low back pain.

#### **PROCEDURE:**

Individuals were explained about the procedure and were selected according to the inclusion and exclusion criteria. Informed consent was taken from all the included subjects before starting the study. 20 participants were divided randomly into 10 for each group as Group A and Group B. Among them group A participants were assigned to follow the core strengthening exercises and group B participants were assigned to follow the pelvic floor exercises. The exercises included 10 repetitions every day for 4 weeks. These groups are assisted by dynamic abdominal muscle endurance test for testing the abdominal strength, Oswestry low back pain disability questionnaire for functional status and VAS (Visual Analogue Scale) for pain was assessed prior to the exercises and post values was taken after 4 weeks of exercise program to both the groups.

#### **DYNAMIC ABDOMINAL MUSCLE ENDURANCE TEST:**

The patient lies supine with the hips at 45-degree knees at 90 degree and the hands at the side. The feet are flat on the table. A line is drawn 12 cms distal to the fingers. The patient tucks in the chin and curls the trunk to touch the line with the fingers. Repeats as many curls as possible using a cadence of 25 repetitions per minute.

#### **Exercise Protocol:**

##### **Group A- Core Strengthening:**

1. Bicycle crunch
2. Plank

3. V-sit exercise
4. Lying side crunch

#### Group B-PELVIC FLOOR EXERCISE:

1. Tonic activation
2. Kegel exercise
3. Pelvic bridging.
4. Functional expiratory pattern.

#### Group-A:

Hot packs on lower back for 15 minutes followed by strengthening exercise.

#### 1. BICYCLE CRUNCH:

The bicycle crunch exercise is the most recommended for abs exercise. It is the best exercise for targeting the rectus abdominis and also the internal and external oblique.

#### PROCEDURE:

- Start by lying on the floor with your back touching the ground.
- Place the hands behind your head without too much pressure.
- Then raise your knees to 45-degree angle and move your legs in a pedalling motion as if you're riding a bicycle.
- Slowly touch your right elbow on your left knee and then your left elbow to your right knee.
- Continue for 3-4 sets consisting of 10 repetitions maintain continuous breathing in and out process throughout the exercise.

#### 2. PLANK:

The plank exercises build endurance in the abs and back as well as the stabilizers muscles. It strengthens the abdomen, back and shoulder involving erector spinae, rectus abdominis and transverse abdominis.

#### PROCEDURE:

- Lie face down on mat resting on the forearms palms flat on the wall.
- Push off the floor raising up on to toes and resting on the elbows.
- Keep your back flat in a straight line from head to heel.
- Tilt pelvis and contract your abdominals to prevent your back from sticking up in the air.
- Hold for 20 minutes lower and repeat for 3 sets.

#### 3. V-SIT EXERCISE:

V-sit exercise is an effective abdominal and core exercise that works the rectus abdominis, the external oblique and internal oblique this exercise also engages the hip flexor.

#### PROCEDURE:

- In a seated position with knee bent and feet of the floor. Chest should be open and lifted.
- Arms by the side slowly unfold from your seated V by simultaneously lowering your torso and legs towards the floor.
- Stop when legs are around 45-degree angle or when lower back arch away from the floor.
- Keep head and shoulders off the floor.
- Keep core tight and tucked use abs to return to the starting.

#### 4. LYING SIDE CRUNCH:

Mainly targets internal and external oblique muscles.

#### PROCEDURE:

- Lie on right side with legs lying on top of each other (knees bent).
- Place left hand on the side of the head.
- Crunch up with side as high as possible.
- Repeat it simultaneously on the other side.

#### Group B:

Hot pack on lower back for 15 minutes followed by pelvic floor exercise.

#### 1. TONIC ACTIVATION:

- The patients place her fingers medial to ASIS (Anterior Superior Iliac Spine) for tactile feedback.
- The patient activates transverse abdominis which influences the pelvic floor muscles to co-contract.
- It helps to promote a gentle and prolonged muscle hold of the pelvic floor muscle through the transverses abdominis co-contraction mechanism.

#### 2. KEGEL EXERCISES:

- The patient in supine lying (crook lying) performed the abdominal drawing in manoeuvre (ADIM) maintaining a strong hold while pulling up the pelvic floor muscles as far as possible as if to stop the flow of urine (or place a ball between knees and squeeze it).
- The main goal is to strengthen the pelvic floor muscles to decrease urinary leakage and strengthen abdominal muscles to promote spinal stability.
- Hold the position for 3-5 seconds with 10 repetitions.

#### 3. PELVIC BRIDGING:

- Lie flat on back with knees bent at a 45-degree angle.
- Hands and arms flat to the ground and do a pelvic thrust by raising the hips in the air as much as you can.
- Contract the pelvic muscles for 5 seconds and release slowly and lower your hips.
- Repeat the exercise for 10 repetitions with 3-5 seconds hold.

#### 4. FUNCTIONAL EXPIRATORY PATTERNS:

- The patient sat upright and initiated a sustained nose blow and was asked to self-evaluate pelvic floor muscle activation during expiration.
- To retrain the pelvic floor muscle to activate in response to functional stresses (i.e. nose blowing, coughing, sneezing)

#### DATA ANALYSIS

Data analysis was done using SPSS version 16.0 using descriptive statistics of mean and standard deviation and analysed using paired t-Test. Level of significance was set at 0.05.

### RESULT

The table 1 shows: Group-A: (Core Strengthening) mean  $\pm$  standard deviation of ODI 24.6  $\pm$  11.43, VAS 3.3  $\pm$  1.05 and DAME 12.4  $\pm$  2.22.

**Table 1: GROUP-A: Core strengthening**

	Mean	Std.Dev	t-value	p-Value
<b>ODI</b>	24.6	11.43	3.440	0.001
<b>VAS</b>	3.3	1.05	6.081	0.000
<b>DAME</b>	12.4	2.22	-6.105	0.000

The table 2 shows: Group-B: (Pelvic floor exercises) mean  $\pm$  standard deviation of ODI 31.6  $\pm$  9.13, VAS  $\pm$  1.07 and DAME 9.6  $\pm$  1.34.

**Table 2: Group-B: Pelvic floor exercises:**

	Mean	Std.Dev	t-Value	p-Value
<b>ODI</b>	31.6	9.13	2.609	0.008
<b>VAS</b>	4.6	1.07	2.828	0.005
<b>DAME</b>	9.6	1.34	-3.523	0.001

**Figure 1: Dynamic Abdominal Muscle Endurance Test**



**Figure 2: Bicycle Crunch:**

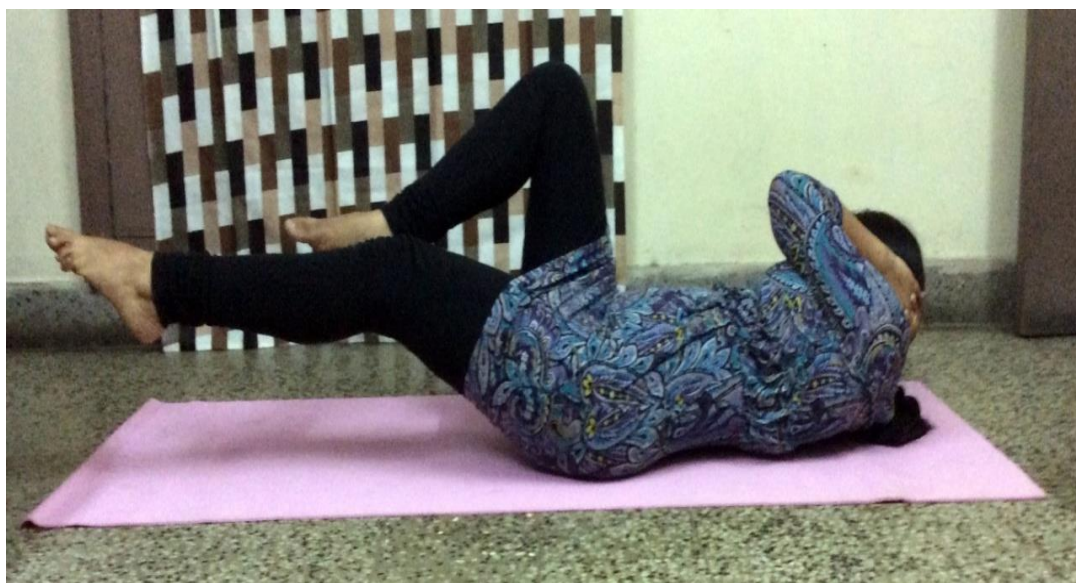
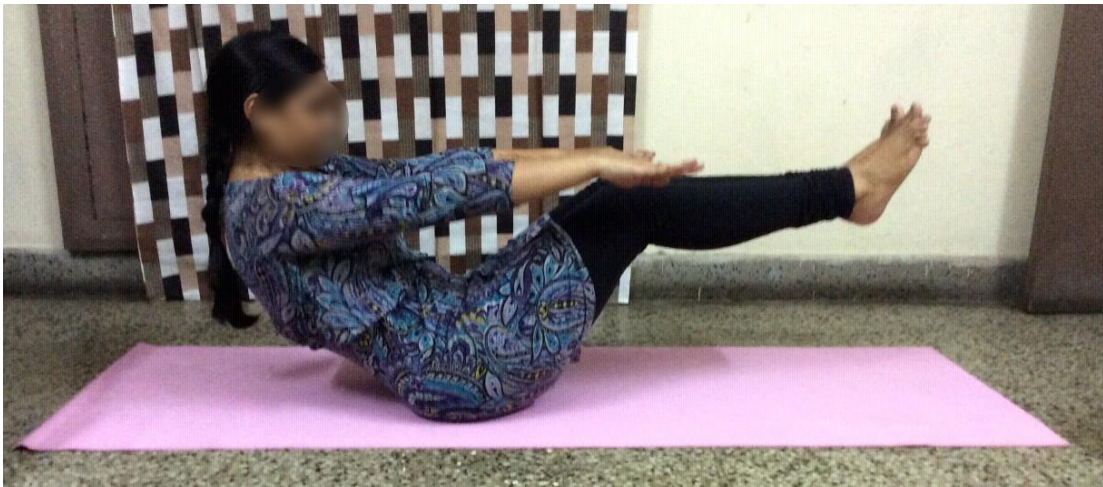


Figure 3: **Plank**



**Figure 4: V-Sit Exercise:**



**Figure 5: Lying Side Crunch:**



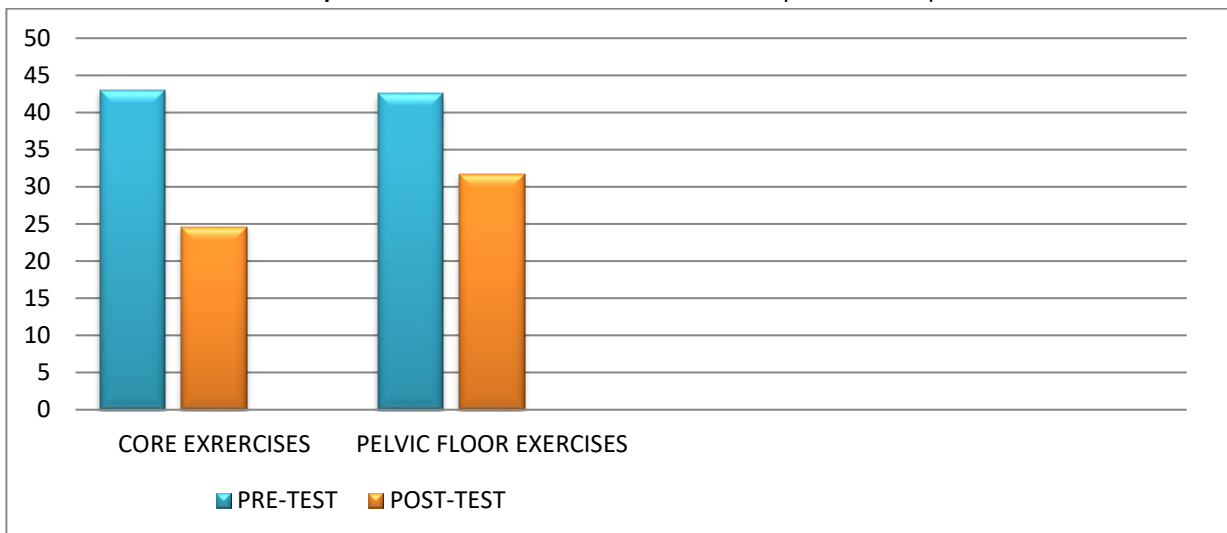
**Figure 6: Kegel Exercises:**



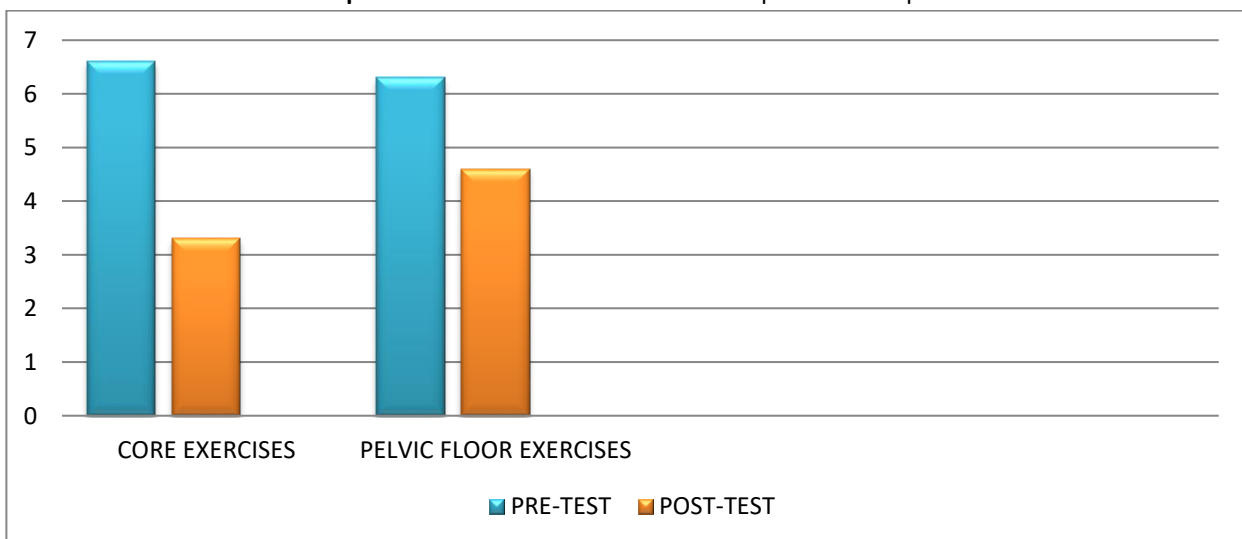
Figure 7: Pelvic Bridging:



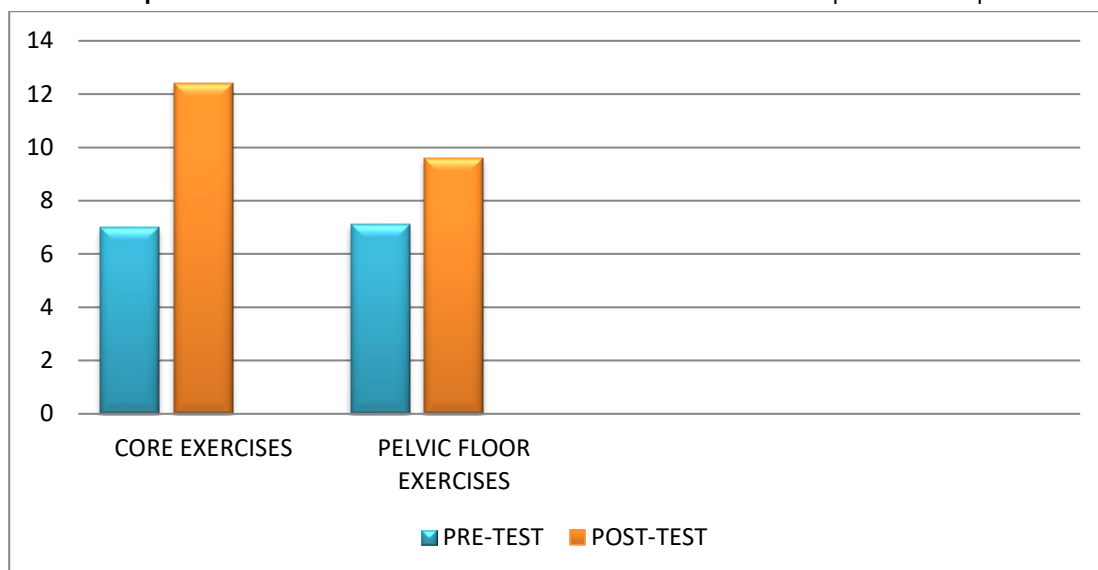
Graph 1 : OSWESTRY DISABILITY INDEX: Group-A and Group-B



Graph 2: VISUAL ANALOGUE SCALE: Group-A and Group-B



**Graph 3: DYNAMIC ABDOMINAL MUSCLE ENDURANCE TEST: Group-A and Group-B**



#### ABBREVIATIONS:

SVD: Spontaneous vaginal Delivery

BMI: Body Mass Index

VAS: Visual Analogue Scale

ODI: Oswestry Disability Index

DAME: Dynamic Abdominal Muscle Endurance

#### DISCUSSION

Priyanka Mhalagi<sup>2</sup> highlighted that specific exercises targeting the core muscles given for a period of 6 weeks after delivery is effective in reducing low back pain in women, the fact that effect of relaxin and progressive weakness of abdominals on account of increase in the size of uterus are going to hamper the strengthening process. There could be increase in the strength of muscles or the strength of the muscle might remain the same. Even if there is no detectable change in the strength it can be concluded that the core strength has increased. Because reduction in core strength is expected due to numerous physiological changes. Thus, even if the strength is maintained there will be prevention of low back pain.

Jiang xia Zhao<sup>4</sup> stated that pelvic floor exercises with increased number of contraction per week, for 12 weeks will show good improvement in reducing pain and improving the functional status were the results were consistent with other findings, who demonstrated the superiority of a core strengthening programme to simple strengthening exercises for chronic low back pain Grillner<sup>18</sup> indicated that co-activation of abdominals, diaphragmatic and pelvic floor muscles are an essential

prerequisite for developing appropriate intra-abdominal, thus supporting the spine. When strengthening of the pelvic floor muscles (Pelvic Floor Muscle) occurs, the load on the lumbar spine decreases. This may be the reason for reducing Low Back Pain and disability.

During and after labour there is extensive musculoskeletal injury especially to lumbar spine as the stability decreases due to weakness of the surrounding muscles and causes back pain. The core strength training regimen which mainly focus on abdominal is muscle and erector spinae helps in increasing the spinal stabilization effectively and reduce low back pain through specific recruitment of muscles of the lumbo-pelvic complex.

The pelvic floor muscle also has an important role in proper muscular activation for lumbar stabilization as these muscles form the base of the abdominal cavity and during the exercise program muscle contract and regain their strength and the load on the lumbar spine decreases.

The current study aims at comparing the effects of both core strengthening and pelvic floor exercises in women with low back pain after normal delivery and determine which intervention is effective in reducing the pain and improving the functional status and abdominal endurance.

#### CONCLUSION

Both the pelvic floor exercise and core strengthening exercise were found to be effective in reducing pain,

disability, and improving the abdominal muscle endurance. However, the subjects treated with core strengthening exercise showed more significant benefits in terms of reduction of pain, disability and improvement in abdominal muscle endurance in treatment of Low Back Pain in women after normal labour.

#### AUTHOR'S CONTRINUTION

1. DR. M.S. Sundaram – Conceptualize the idea, designed the study, Data Analysis, Manuscript Preparation.
2. M. Manju – Data Collection.

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**\*Corresponding Author:**

**M.S. Sundaram\***

Email: [sundaram.sp@velsuniv.ac.in](mailto:sundaram.sp@velsuniv.ac.in)