Cervical radiculopathy is the problem that probably every other person is complaining now a days and etiology is mostly age-related related posture and hectic work routine [1]. According to a survey its incidence rate is 85 % out of 10 thousand, annually and slightly more in male as compare to female [2]. Patients with cervical radiculopathy come with neck ache, weakness of neck muscles, tingling and numbing in upper limbs due to nerve compression or any other degenerated conditions [3]. Another most common reason of cervical radiculopathy is disc herniation in young adults with prevalence of 20% [4]. In disc herniation case patients usually complain of pain like needles and tingling sensation in one or both arms. Acute cervical radiculopathy is self-limited and 70% get improved by non-surgical l

**A B S T R A C T**

Cervical radiculopathy is the problem that probably every other person is complaining now a days and etiology is mostly age-related related posture and hectic work routine. **Objective:** Current trial was designed to associate the impact of cervical pull, foramen initial and both combined techniques on level of disablement, pain and range of motions of cervical spine in individuals having cervical radiculopathy. **Methods:** Sampling technique was non-probability and participants were allocated into 3 groups. A, B and C. Informed consent was taken and all subjects were instructed about the trial. Patients who were taking medications or denied to participate in study were excluded. Patients of age 30-50years who were not taking medication were included to conclude the impact of manual techniques. Patients were assigned into treatment groups based on inclusion criteria which is diagnosed MRI cervical radiculopathy unilateral upper extremity pain and numbness and 3 result test were positive out of 4. **Results:** In group A, mean age of subjects was 42.41±6.86 years, 40.95± 7.32 years in group B and 42.50±5.77 years in group C. 8(60%) participants were crabby of sharp and shooting pain in group A. 4(35%) describe the pain as burning and tingling and 1(5%) felt deep dull ache. In analysis of baseline and after completion of treatment assessment of each group, all variant determined considerable outcomes with p <0.05 in terms of Range of motion (ROMs) and neck pain. **Conclusion:** Manual techniques of cervical traction, intervertebral foramen opening and combination of both techniques have similar effect in improving neck ache, ROMs and disability level in patients suffering with cervical radiculopathy.

**I N T R O D U C T I O N**

Cervical radiculopathy is the problem that probably every other person is complaining now a days and etiology is mostly age-related related posture and hectic work routine [1]. According to a survey its incidence rate is 85 % out of 10 thousand, annually and slightly more in male as compare to female [2]. Patients with cervical radiculopathy come with neck ache, weakness of neck muscles, tingling and numbing in upper limbs due to nerve compression or any other degenerated conditions [3]. Another most common reason of cervical radiculopathy is disc herniation in young adults with prevalence of 20% [4]. In disc herniation case patients usually complain of pain like needles and tingling sensation in one or both arms. Acute cervical radiculopathy is self-limited and 70% get improved by non-surgical l
treatment such as traditional physical therapy and exercises. And patient get back to normal within days to weeks [4-5]. In some cases, patient does not recover and needs specific elevation and treatment. If it gets prolong or left untreated, symptoms get worse and can lead to paralysis [6]. Moreover, besides this other problem related to articular structures such as capsular and ligament restriction, inflammation, disc compression due to degenerative changes with age [7-9]. Symptoms can be regenerate by applying Spurling test on affected side pf neck with lateral flexion, extension and rotation [10]. Neck ache is categorized in both chronic and acute based on the intensity and time period of pain. If pain continue less than six weeks, then we consider it acute pain and more than 3 weeks it would be called long-lasting discomfort [11,12]. Physical rehabilitation in addition with pull then technique of intervertebral foramen opening can diminishes the pain, joint stiffness and improve the range of motions [13]. Evidence showed that treatment based on multimodal may improve both acute and chronic neck pain [14,15]. Current trial was designed to associate the impact of cervical pull, foramen initial and both combined techniques on level of disableness, pain and range of motions of cervical spine in individuals having cervical radiculopathy.

M E T H O D S

This study is single-blind randomized control study. Study was carried out in setting of Benazir bhutto hospital, Rawalpindi. Duration was almost six months (jan 2017-july 2017). Patients of both gender were included with upper limb numbness or pain. Sample size was calculated through Epi-tool level 3, with 95% confidence interval (CI), and pore 80%, based on the primary measure which is, the Neck Disability Index (NDI) [13]. Sampling technique was non-probability and participants were allocated into 3 groups. A, B and C. Informed consent was taken and all subjects were instructed about the trial. Patients who were taking medications or denied to participate in study were excluded. Patients of age 30-50years who were not taking medication were included to conclude the impact of manual techniques. Patients were assigned into treatment groups based on inclusion criteria which is diagnosed MRI cervical radiculopathy unilateral upper extremity pain and numbness and 3 result test were positive out of 4: distraction test, Spurling Test, Ipsilateral rotation test and Upper-limb tension test. In patients got opening of intervertebral foramen intervention, Group B were treated with manual cervical traction while group C received both interventions of intervertebral foramen opening and cervical traction. These trial was for 3 weeks and 3 sessions per week. In intervertebral foramen technique, therapist’s hand and fingers twitch the neckline to move the incomplete part of neck. At the meantime, actions remained implemented. Session was carried out in 3 sets of 10 repetitions [9]. In Patient was asked to lying in supine position. Cervical traction, chin was held by physiotherapist. And 25-degree neck flexion forced was applied by therapist. Total time for traction was 10 min in which 10 secs for pull and 5 secs for rest [13,15]. Before getting treatment patients received hot pack for 15 minutes at posterior side of neck. Numeric pain rating scale (NPRS), Neck disability index (NDI) and patients specific fictional scale (PSFS) were used to measure the outcomes. Inclinometer was used to measure the ROMs of cervical. Assessment was carried out as pre and post 3 weeks of treatment. No subject was drop out in Group A and B while group C had one participant dropout. Analysis was done by SPSS 21. Normality was checked by Shapiro Wilk test after test parametric and non-parametric test were applied in among groups and for within groups, paid t test was used. In the term of mean and SD data was presented with p values.

R E S U L T S

23(70%) patients were male and 17(30%) patients were female in sample. In group A, mean age of subjects was 42.41±6.86 years, 40.95± 7.32 years in group B and 42.50±5.77 years in group C. 8(60%) participants were crabby of sharp and shooting pain in group A. 4(35%) describe the pain as burning and tingling and 1(5%) felt deep dull ache. In analysis of baseline and after completion of treatment assessment of each group, all variant determined considerable outcomes with p <0.05 in terms of Range of motion(ROMs)and neck pain.(Table 1)

<table>
<thead>
<tr>
<th>Variables</th>
<th>G1</th>
<th>G1</th>
<th>G2</th>
<th>G2</th>
<th>G3</th>
<th>G3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>NPRS</td>
<td>7.1±1.03</td>
<td>2.5±0.9</td>
<td>7.5±0.67</td>
<td>3.08±0.79</td>
<td>7.5±0.92</td>
<td>2.9±1.18</td>
</tr>
<tr>
<td>NDI</td>
<td>19.5±5.3</td>
<td>9.5±3.7</td>
<td>22.4±4.6</td>
<td>10.6±3.38</td>
<td>2.06±6.3</td>
<td>10.7±4.3</td>
</tr>
<tr>
<td>PSFS</td>
<td>5.9±1.08</td>
<td>8.8±0.4</td>
<td>5.8±1.16</td>
<td>8.3±1.20</td>
<td>6.13±1.23</td>
<td>8.3±0.76</td>
</tr>
</tbody>
</table>

NDI, NPRS, PSFS: STD: Standard Deviation, Right, Left, P-value <0.05

Table 1: Baseline and after treatment analysis in terms of mean & SD of all groups

7(56%) subjects were having shooting and sharp pain, and 6(46%) of subjects felt red-hot and prickly feelings in group B. While in group C 6(40%) participants had burning and shooting pain. 9(64%) patients describe aching in neck which was travel down to the right side of upper limb, 5(35%) complained about pain in the left upper limb as shown in Table 2.
DISCUSSION

One of the most common causes of neck disability is cervical radiculopathy and its prevalence is on peak in 4 to 5th decade of age [16]. There is lack of evidence in literature to define the significance of best interventional approach [17]. To treat the complications linked to cervical radiculopathy, control interventional trial was done to determine the impact if treatment strategies. Outcomes of current study showed the significance in terms of mean and SD from pre to post last session of treatment in NDI, PSFS & NPRS scales. Moreover, ROMs get improved, decrease in neck pain and joint stiffness is also found. These results are being supported by various previous researches [18]. A study showed that by using manual traction and manual foramen opening technique is very beneficial to improve the movements and pain in neck. Based on an outcome of previous study, result has shown that effect of each technique is equally beneficial as both combined techniques. But patients presented significant improvement in movements those get both therapies in combine. It was seen that each 3 groups presented statistically significant progresses in NPRS scaler after intervention of 3 weeks (p<0.01) and same in case of NDI scale. Analysis of individual group presented extremely positive results in regards to neck pain, improvement in ROMs and disability, showing that combination of therapy in these participants is an effective strategy. This also support that we can use these techniques without limitation in any stage of cervical radiculopathy. Numerous researches have proved that both these techniques either separately or as combination therapy would show promising outcomes in patients with cervical radiculopathy [19]. Each intervention decompresses the nerve compression and expand the foramen. These rehabilitative techniques both improves the stiffness in joints and tenderness in tissues. Same results were seen in the current study. Another study indicated the same findings of manual traction on disability, pain and radiculopathy of cervical spine. Subjects were back to normal functions and pain was diminished. Participants presented significance in measures [20]. The outcomes of the current research may also determine the best possible guidelines for clinical practice for treatment of cervical radiculopathy. Small sample size with both acute and chronic conditions is considers as limitation. Duration was also short. A study with prolong time duration and with a large population size is recommended.

CONCLUSION

Manual techniques of cervical traction, intervertebral foramen opening and combination of both techniques have similar effect in improving neck ache, ROMs and disability level in patients suffering with cervical radiculopathy.

REFERENCES


Table 2: (ANOVA) test presents post intervention analyses of following variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>G1 Mean±SD</th>
<th>G2 Mean±SD</th>
<th>G3 Mean±SD</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPRS</td>
<td>2.58±0.90</td>
<td>3.08±0.79</td>
<td>2.94±1.18</td>
<td>0.45</td>
</tr>
<tr>
<td>PSFS</td>
<td>8.80±0.44</td>
<td>8.37±1.20</td>
<td>8.83±0.67</td>
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</tr>
<tr>
<td>NDI</td>
<td>9.58±3.77</td>
<td>6.76±3.60</td>
<td>10.75±4.37</td>
<td>0.71</td>
</tr>
<tr>
<td>Active flexion</td>
<td>52.33±3.79</td>
<td>53.42±2.57</td>
<td>51.31±4.27</td>
<td>0.34</td>
</tr>
<tr>
<td>Active extension</td>
<td>41.92±3.75</td>
<td>41.08±4.53</td>
<td>44.38±6.61</td>
<td>0.31</td>
</tr>
<tr>
<td>Lt side flexion</td>
<td>41.33±5.92</td>
<td>41.50±6.60</td>
<td>39.94±3.58</td>
<td>0.66</td>
</tr>
<tr>
<td>Rt side flexion</td>
<td>40.33±5.74</td>
<td>44.67±3.82</td>
<td>38.88±5.18</td>
<td>0.01**</td>
</tr>
<tr>
<td>Lt t side rotation</td>
<td>58.02±6.97</td>
<td>55.33±4.11</td>
<td>56.44±8.65</td>
<td>0.63</td>
</tr>
<tr>
<td>Rt t side rotation</td>
<td>61.58±6.80</td>
<td>65.17±4.80</td>
<td>63.00±6.72</td>
<td>0.44</td>
</tr>
</tbody>
</table>

Table 3: Between Groups comparison along with p values

D I S C U S S I O N
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