CHAPTER 5
STATISTICAL ANALYSIS AND RESULTS

The sample demographic information is now included. Total 160 participants included in the study, with 96 men (21.4 ± 1.6) and 64 women (20.8 ± 2.4). Subjects were college athletes from both health field and technical sciences who were not under any regular training protocol.

Sample demographic characteristics

<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Group I (Cryotherapy)n=40</th>
<th>Group II (Phonophoresis)n=40</th>
<th>Group III (Exercise)n=40</th>
<th>Group IV (Control)n=40</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12 women, 28 men</td>
<td>16 women, 24 men</td>
<td>20 women, 20 men</td>
<td>16 women,24 men</td>
</tr>
<tr>
<td>Age years</td>
<td>20.8±0.4</td>
<td>21.3±0.7</td>
<td>21.1±0.6</td>
<td>20.4±0.5</td>
</tr>
<tr>
<td>Height Cms</td>
<td>158±3.6</td>
<td>166±4.4</td>
<td>160±3.9</td>
<td>155±2.8</td>
</tr>
<tr>
<td>Mass, Kg</td>
<td>67±1.8</td>
<td>63±3.4</td>
<td>58±2.3</td>
<td>60±4.1</td>
</tr>
<tr>
<td>BMI(Kg/m²)</td>
<td>20.3±2.9</td>
<td>19.4±1.8</td>
<td>21.2±1.6</td>
<td>22.1±1.2</td>
</tr>
</tbody>
</table>

Statistical analyses were conducted using SPSS software (version 17.0) and significance was set at 0.05. Outcome measures Creatine kinase (CK), Lactate dehydrogenase (LDH), VAS score and MIVC were analyzed with a one-way analysis of variance (ANOVA), with repeated time measurements as dependent list and groups as a factor. Equal variances assumed and post hoc tukey multiple comparisons were also performed to find out the significant differences between the groups. Repeated measure ANOVA was performed to find out the significant differences within the groups.

The biochemical parameter of CK, LDH is not normally distributed within the group and between the groups therefore one way ANOVA used to find out the
significant differences between the groups and since each reading is taken more than 4 times as compared to baseline and we wanted to know the trend in change in CK and LDH following therapy, Repeated measures ANOVA is used.

The clinical parameter of MIVC is not normally distributed within the group and between the groups, so one way ANOVA used to find out the significant differences between the groups and since each reading is taken more than 4 times as compared to baseline and we wanted to know the trend in change in MIVC following therapy, Repeated measures ANOVA is used.

The subjective parameter of VAS pain score is not normally distributed within the group and between the groups, so one way ANOVA used to find out the significant differences between the groups and since each reading is taken more than 4 times as compared to baseline and we wanted to know the trend in change in VAS pain scores following therapy, Repeated measures ANOVA is used.

For each of the outcome measures (CK, LDH, MIVC, and VAS), the ANOVA compared the differences between the mean scores of the four groups at baseline, 24, 48, 72, and at 96 hours, and repeated measures ANOVA compared the differences between the timeline measurements taken repeatedly (baseline, 24, 48, 72, and 96 hours) within the groups. (Incorporated in the main thesis).
5.1 CREATINE KINASE (Normal level =60-180 I Units/Liter)

To find out the difference between the groups in each measure One way ANOVA is done.

Table 5.1 Creatine Kinase Group comparison of scores at 0, 24, 48, 72, and 96 hours

<table>
<thead>
<tr>
<th>Groups</th>
<th>Baseline</th>
<th>24 hours</th>
<th>48 hours</th>
<th>72 hours</th>
<th>96 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Cryotherapy</td>
<td>86.38</td>
<td>23.33</td>
<td>276.55</td>
<td>66.21</td>
<td>606.50</td>
</tr>
<tr>
<td>Phonoporesis</td>
<td>81.50</td>
<td>18.67</td>
<td>252.10</td>
<td>71.58</td>
<td>589.95</td>
</tr>
<tr>
<td>Exercise</td>
<td>94.70</td>
<td>28.93</td>
<td>327.78</td>
<td>122.16</td>
<td>558.70</td>
</tr>
<tr>
<td>Control</td>
<td>86.80</td>
<td>21.05</td>
<td>313.08</td>
<td>80.07</td>
<td>661.00</td>
</tr>
<tr>
<td>Anova f value</td>
<td>2.19</td>
<td>6.14</td>
<td>2.32</td>
<td>19.44</td>
<td>27.49</td>
</tr>
<tr>
<td>p value</td>
<td>.091</td>
<td>.001***</td>
<td>.077NS</td>
<td>.000***</td>
<td>.000***</td>
</tr>
</tbody>
</table>

Note: *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.05)

RESULTS

From the above table values, it is noted that at baseline and at 48 hours, there is no significant difference seen in creatine kinase elevation between the four groups (p >0.05), But significant difference were observed at 24 hours, and after 72 hours and 96 hours (p<0.001)
REPEATED MEASURES ANOVA RESULTS

To find out the overall changes within the group Repeated ANOVA was adopted.

Table 5.2 Summary of CK repeated Measures ANOVA findings

<table>
<thead>
<tr>
<th>CK measures</th>
<th>Cryotherapy</th>
<th>Phonoporesis</th>
<th>Exercise</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Baseline</td>
<td>86.37</td>
<td>23.39</td>
<td>81.5</td>
<td>18.66</td>
</tr>
<tr>
<td>24 hours</td>
<td>276.55</td>
<td>66.21</td>
<td>252.10</td>
<td>71.58</td>
</tr>
<tr>
<td>48 hours</td>
<td>606.50</td>
<td>156.18</td>
<td>589.94</td>
<td>146.07</td>
</tr>
<tr>
<td>72 hours</td>
<td>921.4</td>
<td>222.80</td>
<td>905.97</td>
<td>305.102</td>
</tr>
<tr>
<td>96 hours</td>
<td>1134.17</td>
<td>342.42</td>
<td>1043.69</td>
<td>430.79</td>
</tr>
<tr>
<td>Repeated measures Anova test f value</td>
<td>844.63</td>
<td>512.93</td>
<td>136.23</td>
<td>759.53</td>
</tr>
<tr>
<td>P value</td>
<td>.000***</td>
<td>.000***</td>
<td>.000***</td>
<td>.000***</td>
</tr>
</tbody>
</table>

Note: *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.005)

RESULTS

Repeated measures ANOVA results shows that the ck measures overall changes within the groups for all the four groups were found to have difference statistically significant (p<0.01)

ONE WAY ANOVA RESULTS

To find out the significant difference of changes of Creatine kinase measure from baseline- 24 hours, 24-48 hours, 48-72 hours, 72-96 hours (within the period) between the groups, One-way ANOVA test was used.

Table 5.3 CK group Comparison of Scores within the Time Period

<table>
<thead>
<tr>
<th>CK measures</th>
<th>Cryotherapy</th>
<th>Phonoporesis</th>
<th>Exercise</th>
<th>Control</th>
<th>f value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>0-24 hrs</td>
<td>190.17</td>
<td>67.20</td>
<td>170.6</td>
<td>71.6</td>
<td>233.0</td>
<td>113.48</td>
</tr>
<tr>
<td>24-48 hrs</td>
<td>329.95</td>
<td>146.65</td>
<td>337.85</td>
<td>121.20</td>
<td>230.92</td>
<td>175.24</td>
</tr>
<tr>
<td>48-72 hrs</td>
<td>314.97</td>
<td>157.74</td>
<td>316.02</td>
<td>14.70</td>
<td>250.90</td>
<td>225.67</td>
</tr>
<tr>
<td>72-96 hrs</td>
<td>212.69</td>
<td>241.00</td>
<td>137.72</td>
<td>259.74</td>
<td>64.39</td>
<td>175.54</td>
</tr>
</tbody>
</table>

Note: *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.005)
RESULTS

From the above table it is found that changes of Creatine kinase measure from baseline-24 hours, 24-48 hours, 48-72 hours, 72-96 hours (within the period) between the groups, were having statistical significant difference (p<0.001).

Figure 5.1 CK individual group means at 0, 24, 48, 72, and 96 hours

Figure 5.2. CK group comparisons of mean values at 0, 24, 48, 72, & 96 hours
5.2 LACTATE DEHYDROGENASE

(Normal level = 220-400 I Units/Liter)

To find out the difference between the groups in each measure ONE WAY ANOVA is done.

Table 5.4 LDH group comparison of scores at 0, 24, 48, 72, and 96 hours

<table>
<thead>
<tr>
<th>Groups</th>
<th>Baseline</th>
<th>24 hours</th>
<th>48 hours</th>
<th>72 hours</th>
<th>96 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Cryotherapy</td>
<td>256.35</td>
<td>35.77</td>
<td>430.6</td>
<td>56.56</td>
<td>631.4</td>
</tr>
<tr>
<td>Phonoporesis</td>
<td>288.5</td>
<td>28.53</td>
<td>460.12</td>
<td>75.99</td>
<td>651.92</td>
</tr>
<tr>
<td>Exercise</td>
<td>275.2</td>
<td>46.88</td>
<td>452.97</td>
<td>102.82</td>
<td>550.87</td>
</tr>
<tr>
<td>Control</td>
<td>288.6</td>
<td>35.85</td>
<td>499.35</td>
<td>89.05</td>
<td>689.12</td>
</tr>
</tbody>
</table>

ANOVA f value

|     | 6.67 | 4.77 | 9.31 | 50.38 | 38.82 |

p value

|     | .000*** | .003** | .000*** | .000*** | .000*** |

Note: *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.05)

RESULTS

The above table shows that at baseline, 24 hours, 48 hours, 72 hours and at 96 hours the LDH values between the four groups were statistically having significant difference (p<0.001).
REPEATED MEASURES ANOVA

To find out the overall changes from within the group Repeated ANOVA was adopted.

Table 5.5 Summary of LDH repeated measures ANOVA findings

<table>
<thead>
<tr>
<th>LDH measures</th>
<th>Cryotherapy</th>
<th>Phonoporesis</th>
<th>Exercise</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Baseline</td>
<td>256.35</td>
<td>35.77</td>
<td>288.50</td>
<td>28.53</td>
</tr>
<tr>
<td>24 hours</td>
<td>430.6</td>
<td>56.56</td>
<td>460.12</td>
<td>75.99</td>
</tr>
<tr>
<td>48 hours</td>
<td>631.40</td>
<td>122.35</td>
<td>651.92</td>
<td>94.22</td>
</tr>
<tr>
<td>72 hours</td>
<td>716.12</td>
<td>126.09</td>
<td>739.05</td>
<td>131.17</td>
</tr>
<tr>
<td>96 hours</td>
<td>730.45</td>
<td>171.23</td>
<td>713.85</td>
<td>207.03</td>
</tr>
</tbody>
</table>

Repeated measures Anova test f value

|              | 1947.39 | 2333.43 | 840.49 | 1599.87 |

P value

| .000 | .000 | .000 | .000 |

Note: *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.05)

RESULTS

Repeated measures ANOVA results shows that the LDH measures overall changes within the groups for all the four groups were found to have difference statistically significant (p<0.001)

To find out the significant difference of changes of lactate dehydrogenase measure from baseline- 24 hours, 24-48 hours, 48-72 hours, 72-96 hours (within the period) between the groups, One-way ANOVA test was used.

Table 5.6 LDH group comparison of scores within the time period

<table>
<thead>
<tr>
<th>LDH measures</th>
<th>Cryotherapy</th>
<th>Phonoporesis</th>
<th>Exercise</th>
<th>Control</th>
<th>f value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Baseline-24 hrs</td>
<td>174.25</td>
<td>53.04</td>
<td>171.62</td>
<td>74.15</td>
<td>177.77</td>
<td>85.15</td>
</tr>
<tr>
<td>24-48 hrs</td>
<td>200.79</td>
<td>100.96</td>
<td>191.799</td>
<td>78.88</td>
<td>97.89</td>
<td>90.79</td>
</tr>
<tr>
<td>48-72 hrs</td>
<td>84.72</td>
<td>79.03</td>
<td>87.12</td>
<td>130.03</td>
<td>85.0</td>
<td>120.55</td>
</tr>
<tr>
<td>72-96 hrs</td>
<td>14.32</td>
<td>121.28</td>
<td>25.19</td>
<td>137.48</td>
<td>87.19</td>
<td>77.26</td>
</tr>
</tbody>
</table>

Note: *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.05)
RESULTS

One way ANOVA results shows that the LDH changes between the four groups were found to have significant difference statistically at 24-48 hours, 48-72 hours and at 72-96 hours.

*Figure 5.3 LDH individual group means at 0, 24, 48, 72, and 96 hours*
5.3 **MAXIMUM ISOMETRIC VOLUNTARY CONTRACTION (MIVC)**

To find out the difference between the groups in each measure One way ANOVA is done.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Baseline Mean</th>
<th>SD</th>
<th>24 hours Mean</th>
<th>SD</th>
<th>48 hours Mean</th>
<th>SD</th>
<th>72 hours Mean</th>
<th>SD</th>
<th>96 hours Mean</th>
<th>SD</th>
<th>Anova f value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cryotherapy</td>
<td>40.0</td>
<td>4.92</td>
<td>34.65</td>
<td>5.600</td>
<td>29.52</td>
<td>5.7</td>
<td>25.12</td>
<td>5.58</td>
<td>24.27</td>
<td>6.39</td>
<td>1.36</td>
<td>.254 NS</td>
</tr>
<tr>
<td>Phonoporesis</td>
<td>40.85</td>
<td>4.40</td>
<td>35.3</td>
<td>4.81</td>
<td>30.92</td>
<td>4.84</td>
<td>30.3</td>
<td>6.38</td>
<td>33.87</td>
<td>8.30</td>
<td>.114</td>
<td>.334 NS</td>
</tr>
<tr>
<td>Exercise</td>
<td>41.25</td>
<td>5.24</td>
<td>35.27</td>
<td>5.01</td>
<td>32.42</td>
<td>5.00</td>
<td>33.4</td>
<td>5.982</td>
<td>36.45</td>
<td>6.168</td>
<td>8.63</td>
<td>.000***</td>
</tr>
<tr>
<td>Control</td>
<td>39.37</td>
<td>3.446</td>
<td>33.47</td>
<td>4.75</td>
<td>26.87</td>
<td>4.696</td>
<td>22.95</td>
<td>4.044</td>
<td>21.92</td>
<td>5.60</td>
<td>29.33</td>
<td>.000***</td>
</tr>
</tbody>
</table>

Note: *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.05)

**RESULTS**

From the above table it is noted that at baseline and at 24 hours the MIVC measures between the four groups were found to be not significant statistically (p>0.05), but after 48 hours it was having significant difference between the groups (p<0.001).
**REPEATED MEASURES ANOVA:** To find out the overall changes from within the group Repeated ANOVA was adopted.

Table 5.8 *Summary of MIVC repeated measures ANOVA findings*

<table>
<thead>
<tr>
<th>MIVC measures</th>
<th>Cryotherapy</th>
<th>Phonoporesis</th>
<th>Exercise</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean  SD</td>
<td>Mean  SD</td>
<td>Mean  SD</td>
<td>Mean  SD</td>
</tr>
<tr>
<td>Baseline</td>
<td>39.99 4.92</td>
<td>40.84 4.40</td>
<td>41.25 5.246</td>
<td>39.37 3.446</td>
</tr>
<tr>
<td>24 hours</td>
<td>34.65 5.60</td>
<td>35.30 4.815</td>
<td>35.27 5.01</td>
<td>33.47 4.75</td>
</tr>
<tr>
<td>48 hours</td>
<td>29.52 5.71</td>
<td>30.92 4.84</td>
<td>32.42 5.00</td>
<td>26.87 4.69</td>
</tr>
<tr>
<td>72 hours</td>
<td>25.12 5.58</td>
<td>30.29 6.38</td>
<td>33.40 5.98</td>
<td>22.95 4.04</td>
</tr>
<tr>
<td>96 hours</td>
<td>25.12 6.39</td>
<td>33.87 8.30</td>
<td>36.44 6.168</td>
<td>21.925 5.60</td>
</tr>
<tr>
<td>Repeated measures Anova test f value</td>
<td>1531.01</td>
<td>1790.19</td>
<td>2226.80</td>
<td>2600.80</td>
</tr>
<tr>
<td>P value</td>
<td>.000***</td>
<td>.000***</td>
<td>.000***</td>
<td>.000***</td>
</tr>
</tbody>
</table>

Note: *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.05)

**RESULTS**

Repeated measures ANOVA results shows that the MIVC measures overall changes within the groups for all the four groups were found to have difference statistically significant (p<0.001)

To find out the significant difference of changes of maximum isometric voluntary contraction measure from baseline- 24 hours, 24-48 hours, 48-72 hours, 72-96 hours (within the period) between the groups, One-way ANOVA test was used.

Table 5.9 *MIVC group comparison of scores within the time period*

<table>
<thead>
<tr>
<th>MIVC measures</th>
<th>Cryotherapy</th>
<th>Phonoporesis</th>
<th>Exercise</th>
<th>Control</th>
<th>f value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean  SD</td>
<td>Mean  SD</td>
<td>Mean  SD</td>
<td>Mean  SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline-24 hrs</td>
<td>5.35 2.56</td>
<td>5.55 1.58</td>
<td>5.97 2.33</td>
<td>5.9 2.898</td>
<td>0.6049</td>
<td>.613  NS</td>
</tr>
<tr>
<td>24-48 hrs</td>
<td>5.12 2.53</td>
<td>4.37 2.2</td>
<td>2.85 4.15</td>
<td>6.6 2.45</td>
<td>11.2</td>
<td>.000***</td>
</tr>
<tr>
<td>48-72 hrs</td>
<td>4.4 3.27</td>
<td>0.62 4.04</td>
<td>0.97 3.74</td>
<td>3.92 3.56</td>
<td>20.00</td>
<td>.000***</td>
</tr>
<tr>
<td>72-96 hrs</td>
<td>0.85 4.61</td>
<td>3.57 3.95</td>
<td>3.05 2.88</td>
<td>1.02 4.15</td>
<td>5.5</td>
<td>.000***</td>
</tr>
</tbody>
</table>

Note: *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.05)
RESULTS

From the above table it was found that only at baseline-24 hours no significant differences were observed. But at 24-48 hours, 48-72 hours and at 72-96 hours significant differences were observed (p<0.001).

Figure 5.5 MIVC individual group means at 0, 24, 48, 72, and 96 hours

Figure 5.6 MIVC group comparisons of mean values at 0, 24, 48, 72 and 96 hours
Table 5.10  *Repeated measures ANOVA for dependent variables CK, LDH and MIVC between the group comparisons*

To find out the overall changes within the group Repeated ANOVA was adopted.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Creatine Kinase IU/L (CK)</th>
<th>Lactate dehydrogenase IU/L (LDH)</th>
<th>Maximum Isometric Voluntary contraction (MIVC) lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Repeated measures ANOVA f value</td>
<td>P value</td>
<td>Repeated measures ANOVA f value</td>
</tr>
<tr>
<td>Cryotherapy</td>
<td>844.63</td>
<td>0.000***</td>
<td>1947.39</td>
</tr>
<tr>
<td>Phonophoresis</td>
<td>512.93</td>
<td>0.000***</td>
<td>2333.43</td>
</tr>
<tr>
<td>Exercise</td>
<td>136.23</td>
<td>0.000***</td>
<td>840.49</td>
</tr>
<tr>
<td>Control</td>
<td>759.53</td>
<td>0.000***</td>
<td>1599.87</td>
</tr>
</tbody>
</table>

**Note:** *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.005)

**RESULTS**

Repeated measures ANOVA results shows that the CK, LDH and MIVC measures overall changes within the groups for all the four groups were found to have difference statistically significant (p<0.001).

### 5.4 PAIN SCORE

To find out the difference between the groups in each measure one way ANOVA is done.

Table 5.11  *Pain VAS scores for four groups taken at pre and post treatment levels*

<table>
<thead>
<tr>
<th>Groups</th>
<th>24 hours</th>
<th>96 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Cryotherapy</td>
<td>5.08</td>
<td>0.512</td>
</tr>
<tr>
<td>Phonoporesis</td>
<td>5.12</td>
<td>0.51</td>
</tr>
<tr>
<td>Exercise</td>
<td>5.07</td>
<td>0.52</td>
</tr>
<tr>
<td>Control</td>
<td>5.13</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Anova f value | 0.110     | 183.4     |
p value       | .954NS    | .000***   |

**Note:** *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.005)
RESULTS

The above table shows that pain scores at 24 hours between the groups were not found to have significant difference (p>0.05) but at 96 hours the pain scores were showing statistically significant difference (p<0.001).

To find out the significant difference of changes of Pain measure from 24-96 hours (within the period) between the groups, One-way ANOVA test was used.

Table 5.12: Pain score changes within the time period between the groups

<table>
<thead>
<tr>
<th>Pain measures</th>
<th>Cryotherapy Mean</th>
<th>SD</th>
<th>Phonoporesis Mean</th>
<th>SD</th>
<th>Exercise Mean</th>
<th>SD</th>
<th>Control Mean</th>
<th>SD</th>
<th>f value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-96 hours</td>
<td>2.18</td>
<td>0.41</td>
<td>3.98</td>
<td>0.55</td>
<td>3.13</td>
<td>0.38</td>
<td>2.21</td>
<td>0.50</td>
<td>133.19</td>
<td>.000***</td>
</tr>
</tbody>
</table>

Note: *p<0.05, **p<0.01, ***p<0.001, NS- Not significant (p>0.05)

The differences of change in pain measure from 24-96 hours between the groups were found to be statistically significant in between the four groups (p<0.001)

Figure 5.7: VAS Score group comparisons of mean values at 24, and 96 hours
5.5 CORRELATION COEFFICIENT ANALYSIS

“A Pearson product-moment correlation coefficient was computed to assess the relationship between the changes of baseline to 96 hours values and from 72 hours to 96 hours values between the variables Maximum isometric voluntary contraction (MIVC) with Creatine kinase (CK), Lactate dehydrogenase (LDH) and with VAS Score in the individual groups.

Table 5.13  Values (Baseline-96 hours and from 72-96 hours) of correlation Coefficients between the variables MIVC and CK in four groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Baseline-96 hrs</th>
<th>72 hrs-96 hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r value</td>
<td>p value</td>
</tr>
<tr>
<td>Cryotherapy</td>
<td>-0.24</td>
<td>0.131NS</td>
</tr>
<tr>
<td>Phonophoresis</td>
<td>0.02</td>
<td>0.879NS</td>
</tr>
<tr>
<td>Exercises</td>
<td>-0.27</td>
<td>0.087NS</td>
</tr>
<tr>
<td>Control</td>
<td>0.15</td>
<td>0.328NS</td>
</tr>
</tbody>
</table>

RESULTS

There was a negative correlation noted in between the changes from baseline to 96 hours, between the two variables, MIVC and CK in group 1 (Cryotherapy) and as well as in group 3(Exercise) (r= -0.24, and -0.27). But the results showing lack of statistically significant relationships in the above two groups (p=0.131, and 0.087) and a positive correlation in group 2 (Phonophoresis) and in group 4 (Control) (r= 0.02, and 0.15) and the differences found to be statistically not significant (P=0.879, and 0.328). However in the time changes between 72-96 hours, negative correlation was observed in group 3 and group 4(r= -0.167, -0.164), positive correlation observed in group 1 (r=0.043) and weak relationship observed in group 2 since r value is very close to zero(r=0.008). The differences were found to be statistically not significant(p>0.05) in all the four groups between the changes from 72-96 hours.
Table 5.14  *Values (Baseline-96 hours and from 72-96 hours) of correlation Coefficients between the variables MIVC and LDH in four groups*  

<table>
<thead>
<tr>
<th>Groups</th>
<th>Baseline-96 hrs</th>
<th>72 hrs-96 hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r value</td>
<td>p value</td>
</tr>
<tr>
<td>Cryotherapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-0.003</td>
<td>0.986&lt;sup&gt;NS&lt;/sup&gt;</td>
</tr>
<tr>
<td>Phonophoresis</td>
<td>-0.196</td>
<td>0.223&lt;sup&gt;NS&lt;/sup&gt;</td>
</tr>
<tr>
<td>Exercises</td>
<td>0.033</td>
<td>0.836&lt;sup&gt;NS&lt;/sup&gt;</td>
</tr>
<tr>
<td>Control</td>
<td>0.129</td>
<td>0.426&lt;sup&gt;NS&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**RESULTS**

In the changes between baseline to 96 hours, negative correlation was observed in group 2 (r = -0.196) and positive correlation in group 4 (r=0.129). In groups 1 and 3, weak relationship was seen since r values were close to zero (r= -0.003, 0.033). In the changes between 72-96 hours, positive correlation was noted in group 1(r=0.112), negative correlation noted in group 4(r= -0.12) and weak relationship in groups 2 and 3(r=0.093,0.021). The differences between the two variables at both the time changes (baseline-96 hours and from 72-96 hours) was found to be statistically not significant in all the four groups (p>0.05)

Table 5.15  *Values (Baseline-96 hours) of correlation Coefficients between the variables MIVC and VAS in four groups*  

<table>
<thead>
<tr>
<th>Groups</th>
<th>Baseline-96 hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r value</td>
</tr>
<tr>
<td>Cryotherapy</td>
<td>0.119</td>
</tr>
<tr>
<td>Phonophoresis</td>
<td>-0.254</td>
</tr>
<tr>
<td>Exercises</td>
<td>-0.066</td>
</tr>
<tr>
<td>Control</td>
<td>0.101</td>
</tr>
</tbody>
</table>
RESULTS

A positive correlation found in group 1 and group 4 (r=0.119, 0.101) and a negative correlation found in group 2 and group 3 (r= -0.254, -0.066). However the differences between the two variables at the time change from baseline-96 hours was found to be statistically not significant in all the four groups (p>0.05)