6. Serum Cholesterol

Table No. 58 Statistical analysis of sr. cholesterol

<table>
<thead>
<tr>
<th>SR. CHOLESTEROL</th>
<th>Mean BT</th>
<th>Mean AT</th>
<th>t-Value</th>
<th>P-Value</th>
<th>% Effect</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A</td>
<td>195.5</td>
<td>180.0</td>
<td>6.943</td>
<td>0.000</td>
<td>8.0</td>
<td>Significant</td>
</tr>
<tr>
<td>Group B</td>
<td>185.6</td>
<td>179.8</td>
<td>9.766</td>
<td>0.000</td>
<td>3.1</td>
<td>Significant</td>
</tr>
<tr>
<td>Group C</td>
<td>175.3</td>
<td>175.3</td>
<td>-0.069</td>
<td>0.945</td>
<td>0.0</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

Since the observations are quantitative, we have used paired t-test to test the efficacy in Group A, Group B and Group C. From above table we can observe that P-Values for Group A and Group B was less than 0.05. While P-Value for Group C was greater than 0.05. Hence we conclude that effect observed was significant in Group A and Group B. While Effect observed in Group C was not significant. Effect observed in Group A was 8%, in Group B was 3.1% and in Group C was 0%.

Graph No. 46 Statistical analysis of serum cholesterol

Test for reduced Sr. Cholesterol:

There are three variables related reduced Sr. cholesterol, as

X: Sr. cholesterol reduced by treatment A,
Y: Sr. cholesterol reduced by treatment B and
Z: Sr. cholesterol reduced by treatment C.

Hypothesis 1: Test normality of three variables:
For testing normality we use Shapiro-Wilk normality test.

For X: Test statistic \( W = 0.8248 \), p-value = 0.0001921 < 0.05. Therefore normality does not hold.

For Y: Test statistic \( W = 0.9843 \), p-value = 0.9241 > 0.05. Therefore normality holds.

For Z: Test statistic \( W = 0.7096 \), p-value = 2.155e-06 < 0.05. Therefore normality does not hold.

Result shows variables A and C are not normal.

**Hypothesis 2**: To test whether average Sr. cholesterol reduced by using treatment A, average Sr. cholesterol reduced by using treatment B and average Sr. cholesterol reduced by using treatment C are same or not.

Since normality does not hold for all three variables X, Y and Z. To test this hypothesis we use non-parametric test.

Therefore for testing this hypothesis we use Kruskal Wallis one way ANOVA test, under this test instead of average we use median. The result of this test is as below:

Kruskal-Wallis chi-squared = 57.3274, df = 2, p-value = 3.561e-13

Conclusion: since p-value = 3.561e-13 < 0.05, median reduced Sr. cholesterol by treatment A, B and C are different.

**Hypothesis 3**: To test

\[ H_0: \text{Median reduced Sr. cholesterol by treatment A and B are equal} \]

\[ H_1: \text{Median reduced Sr. cholesterol by treatment A > median reduced Sr. cholesterol by treatment B.} \]

[we use median since normality does not hold]

For testing this hypothesis we use median test. The result of this test is as below:

Chi Sq statistic = 15.0167

p-value = 0.00011

Conclusion: since p-value = 0.00011 < 0.05, median reduced Sr. cholesterol by treatment A > treatment B.

**Hypothesis 4**: To test

\[ H_0: \text{Median reduced Sr. cholesterol by treatment A and C are equal} \]

\[ H_1: \text{Median reduced Sr. cholesterol by treatment A > treatment C.} \]

For testing this hypothesis we use Kruskal Wallis one way ANOVA test, under this test instead of average we use median. The result of this test is as below:

Kruskal-Wallis chi-squared = 72.3467, df = 2, p-value = 3.496e-16

Conclusion: since p-value = 3.496e-16 < 0.05, median reduced Sr. cholesterol by treatment A > treatment C.
H1: Median reduced Sr. cholesterol by treatment A > median reduced Sr. cholesterol by treatment C.

[we use median since normality does not hold]

For testing this hypothesis we use median test. The result of this test is as below:

\[
\text{Chi Sq statistic } = 38.5714 \\
p-value = 5.3 \times 10^{-10}
\]

Conclusion: since p-value = $5.3 \times 10^{-10} < 0.05$,
median reduced Sr. cholesterol by treatment A > treatment C. Among treatment A, treatment B and treatment C, median reduced Sr. cholesterol by treatment A > than that of treatment B and treatment C.

**Graph No. 47 Mean reduction in serum cholesterol**

![Graph showing mean reduction in serum cholesterol for treatments A, B, and C.](image)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Average Sr. Cholesterol Before</th>
<th>Average Sr. Cholesterol After</th>
<th>Average Sr. Cholesterol Reduced</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>195.55</td>
<td>180.00</td>
<td>15.55</td>
</tr>
<tr>
<td>B</td>
<td>185.57</td>
<td>179.83</td>
<td>5.73</td>
</tr>
<tr>
<td>C</td>
<td>175.27</td>
<td>175.31</td>
<td>-0.04</td>
</tr>
</tbody>
</table>