To Study -
the efficacy of Nifedipine, Digitalis, Calcium Chloride and Potassium Chloride in relation to Electrophysiological Changes in Ischaemic condition of the heart induced by complete closure of the left anterior descending coronary artery in anaesthetised Cat.
The right and left coronary arteries supply the myocardium each arising from the aorta immediately above the semilunar valves. The left coronary artery after a short course divides into a left circumflex and an anterior descending branch. The circumflex branch traverses to the left in the A-V groove ending in a position as a descending branch. The anterior descending branch courses the interventricular groove to reach the apex, yielding some septal branches in transit.

The right coronary artery passes along the right atrioventricular sulcus towards the back of the heart where it gives off several descending branches to both ventricles. Each of the coronary rami during their superficial course to the apex gives off branches all of which enter the myocardium. At the apex terminal divisions of the various arteries pass inwards to supply the inner layers of the myocardium and the papillary muscles from which arise myocardial capillaries which lead to vein. Eighty percent of the left coronary artery inflow drains into the coronary sinus and 15% enters the right ventricle by deep venous channels.

80 - 90% of the right coronary drains via the anterior cardiac veins into the right atrium. A minor fraction drains into the coronary sinus. (Keele, C.A. et al 1991)
### Electrophysiological Changes before Occlusion of the Left Anterior Descending Coronary Artery

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
<th>Value 4</th>
<th>Value 5</th>
<th>Mean ± S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Rate</td>
<td>102</td>
<td>104</td>
<td>109</td>
<td>105</td>
<td>107</td>
<td>105.4 ± 3.15</td>
</tr>
<tr>
<td>P Wave - A(mV)</td>
<td>0.5</td>
<td>0.6</td>
<td>0.5</td>
<td>0.6</td>
<td>0.5</td>
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<tr>
<td>P Wave - D(sec)</td>
<td>0.08</td>
<td>0.09</td>
<td>0.08</td>
<td>0.08</td>
<td>0.08</td>
<td>0.082 ± 4x10⁻³</td>
</tr>
<tr>
<td>Q Wave - A(mV)</td>
<td>0.2</td>
<td>0.3</td>
<td>0.2</td>
<td>0.3</td>
<td>0.2</td>
<td>0.24 ± 0.0489</td>
</tr>
<tr>
<td>Q Wave - D(sec)</td>
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<td>0.04</td>
<td>0.04</td>
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<td>0.04</td>
<td>0.04 ± 0</td>
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<tr>
<td>R Wave - A(mV)</td>
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<td>0.9</td>
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<td>0.06</td>
<td>0.06</td>
<td>0.06</td>
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<tr>
<td>S Wave</td>
<td>Isoelectric</td>
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</tr>
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<td>T Wave - A(mV)</td>
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<td>0.5</td>
<td>0.6</td>
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</tr>
<tr>
<td>T Wave - D(sec)</td>
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<td>0.12</td>
<td>0.14</td>
<td>0.14</td>
<td>0.14</td>
<td>0.132 ± 9.79x10⁻³</td>
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<tr>
<td>P-R</td>
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<td>0.11</td>
<td>0.10</td>
<td>0.11</td>
<td>0.10</td>
<td>0.108 ± 7.48x10⁻³</td>
</tr>
<tr>
<td>QT</td>
<td>0.27</td>
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<td>0.25</td>
<td>0.26</td>
<td>0.25</td>
<td>0.258 ± 7.48x10⁻³</td>
</tr>
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</table>

S.D. = Standard Deviation
15.2 The electrophysiological changes after occlusion of the Left Anterior Descending Coronary artery

<table>
<thead>
<tr>
<th>Mean</th>
<th>S.D.</th>
<th>P value</th>
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</thead>
<tbody>
<tr>
<td>Heart rate</td>
<td>116 116 112 116 109</td>
<td>113.8 ± 40.8</td>
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<tr>
<td>A(mv)</td>
<td>.9 .8 .9 .8 .9</td>
<td>0.86 ± 0.0489</td>
</tr>
<tr>
<td>P value</td>
<td>D(sec) .06 .08 .07 .06</td>
<td>0.06 ± 0.00</td>
</tr>
<tr>
<td>Q wave</td>
<td>D(sec) .03 .04 .03 .04 .04</td>
<td>0.336 ± 4.89x10^-3</td>
</tr>
<tr>
<td>A(mv)</td>
<td>.4 .3 .4 .4 .4</td>
<td>0.38 ± 0.04</td>
</tr>
<tr>
<td>R wave</td>
<td>D(sec) .04 .04 .04 .04 .04</td>
<td>0.04 ± 0</td>
</tr>
<tr>
<td>S wave</td>
<td>D(sec) .03 .03 .03 .03 .03</td>
<td>0.03 ± 0</td>
</tr>
<tr>
<td>A(mv)</td>
<td>2.7 2.6 2.8 2.6 2.5</td>
<td>2.6 ± 0.10</td>
</tr>
<tr>
<td>T wave</td>
<td>D(sec) .16 .14 .16 .14 .16</td>
<td>0.152 ± 7.48x10^-3</td>
</tr>
<tr>
<td>ST segment</td>
<td>Depressed</td>
<td></td>
</tr>
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<td>P-R</td>
<td>.09 .10 .11 .11 .10</td>
<td>0.402 ± 7.48x10^-3</td>
</tr>
<tr>
<td>QT</td>
<td>.25 .25 .26 .25 .27</td>
<td>0.256 ± 8x10^-3</td>
</tr>
</tbody>
</table>

S.D. = Standard Deviation, P.Value = P.Value, Sig. = Significant, NS = Nothing Significant.
15.3 Observation:

There is slight tachycardia. The mean values of heart rates are $105.4 \pm 3.13$, $113.3 \pm 4.08$ before and after occlusion and P values $< 0.01$. The most conspicuous change is the slopping of ST Segment.

The significant changes are found in all the waves and in all cases P value is less than $<0.01$. The P-R interval and QT interval have no significant changes.
15.5 The effect of Nifedipine after occlusion of the Left Anterior descending coronary artery

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>P.value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart rate</td>
<td>124</td>
<td>124</td>
<td>124.8 ± 1.6</td>
</tr>
<tr>
<td>A(mv) P wave-</td>
<td>1.2</td>
<td>1.1</td>
<td>1.2</td>
</tr>
<tr>
<td>D(sec)</td>
<td>0.07</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>A(mv) q wave-</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
</tr>
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<td>D(sec)</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
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<tr>
<td>A(mv) r wave-</td>
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<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>D(sec)</td>
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<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>A(mv) 3 wave-</td>
<td>1.9</td>
<td>1.6</td>
<td>1.8</td>
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<tr>
<td>D(sec)</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>A(mv) T segment</td>
<td>0.8</td>
<td>0.9</td>
<td>0.8</td>
</tr>
<tr>
<td>D(sec)</td>
<td>0.12</td>
<td>0.12</td>
<td>0.12</td>
</tr>
<tr>
<td>3 - R</td>
<td>0.16</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>3 - T</td>
<td>0.22</td>
<td>0.21</td>
<td>0.21</td>
</tr>
</tbody>
</table>

S.D. = Standard Deviation, P.V = P value, Sig. = Significant.
15.4 Discussion:

The occlusion of Left anterior descending artery will cause acute circulating insufficiency of the anterior part of the heart, septal part and the apex. This experiment is clinically resemble to acute myocardial infarction of anterior septal part of the heart.

Schamroth, L. (1986) has described that there may be sinus tachycardia, sinus bradycardia a normal sinus rhythm. In the present experiment there is slight variation of heart rate, naturally it is normal sinus rhythm and quite compatible with Schamroth, L. (1986) findings. In the present experiment, the E.C.G. was confined only to lead II. Naturally it is devoid of the findings of chest leads. Goldman, M.J. (1988) has described the QS wave of complete transmural infarction. In the present experiment, the deep S wave is noted. Goldman, M.J. (1988) has described that the Q wave may appear very early or late. They are usually not seen in the first few hours, following infarction. As the present experiment it is 10 - 15 minutes; naturally this could be the explanation of normal unchanged Q waves.

ST segment:

Schamroth, L. (1986) has described two types of ST segment depression:

i) Plane depression
ii) Sagging depression
He has described that the earliest sign of coronary insufficiency is an alteration in the shape of ST segment, resulting in sharp angle ST-T fraction.

In present experiment E.C.G. was done within few minutes and shape angle ST-T fraction was noted and ST segment depression was sagging depression.

T wave:

Tall and widened T wave is found in hyperacute phase of myocardial infraction. This condition lasts for few hours to seven days. In the present experiment E.C.G. was done within few minutes and the T wave was tall and widened of hyperacute myocardial infraction.

Thus in the present experiment the characteristic findings are normal sinus rhythm, deep S wave, sharp angle, ST-T segment, sagging depression, T wave tall and widened.
15.6 Observation:

The heart has been increased. The mean values before and after Nifedipine are $113.8 \pm 40.8$, $124.8 \pm 1.6$; $P$ value $< 0.01$ which is statistically significant.

The amplitude of $P$ value are increased and the mean values are $0.86 \pm 0.0489$, $1.16 \pm 0.0489$ respectively and $P$ value is statistically significant.

The amplitude of $R$ wave also increased and the values are $0.56 \pm 0.0489$, $0.84 \pm 0.0489$ respectively and $P$ value $< 0.01$ which is significant.

The $Q$ wave is still deep but much less than before. The respective values are $0.38 \pm 0.04$, $0.22 \pm 0.04$ before and after Nifedipine and $P$ value is $< 0.01$ which quite significant.

The amplitude of $T$ wave also increased and the mean values are $1.04 \pm 0.0489$, $0.84 \pm 0.0489$ respectively but $P$ value $< 0.01$ and is significant.

P-$R$ and Q-$T$ intervals remain same. The most conspicuous change is the elevation of ST segment.

15.7 Discussion:

The experiment is done to see the effect of Nifedipine in myocardial insufficiency caused by occlusion of left Anterior descending Coronary Artery (LAD). This drug is now very commonly used in clinical medicine in myocardial infraction. Naturally the experiment has intensive clinical value.
The improvement coronary flow is achieved by various ways -

i) decrease the extravascular resistance through the reduction in myocardial stiffness with improved compliance. It is brought by a decrease in pre and after lead through arteriolar dilatation in the endocardial and middle layers of the myocardium concerning mainly arteriols which are compressed under the increased muscle stiffness and finally by functional dilatation of epicardial obstruction (Engel, H.J. and Litchen, P.R. 1983).

ii) Nifedipine inhibits partially the entry of Ca\textsuperscript{++} through the cell membrane and impairs the concentration of Ca\textsuperscript{++} in smooth muscle cells and working myocardium and results in vascular smooth muscle relaxation (Litchen, P.R. 1974).

iii) There is decreasing in blood pressure (after load reduction) specially in hypertensive patients (Bilihler, F, 1984), but also in the normotensive coronary patients specially during exercise (Hanrath, P. et al 1976).

iv) This drop of blood pressure and peripheral vascular resistance (Litchen, P. 1976) is associated with significant increase in cardiac output (Harnat, P. et al 1982, Lichtlen, P. 1975).

v) No change in venous system has been observed (Amende, I, et al 1980).

In the present experiment there is significant decrease in heart rate. The P value is < 0.01. Lichtlen, P. et al (1984) have described that increased cardiac output and decrease of after lead cause increase Baroreceptors tone and there by
increase heart rate. In the present experiment, the heart rate also increases. The observation is quite compatible with all the above authors.

Lichtlen, P. et al (1984) has also described that all the factors like decrease of pre load, stimulation of Baroreceptors are responsible for increase in heart rate and also to increase the cardiac contractibility i.e. positive inotropic effect which may be responsible for increase in amplitude of all the waves and elevation of ST segment. The changes in E.C.G. in the present experiment is due to multiple factors which helps the positive Inotropic effect on the heart.

Thus this experiment may be concluded that the Nifedipine has got definite effect in E.C.G. changes as well as clinical improvement of the myocardial infraction patients.
The Electrophysiological effect of Digitalis after occlusion of left anterior descending coronary artery

<table>
<thead>
<tr>
<th></th>
<th>Mean &amp; S.D.</th>
<th>P.V.</th>
<th>Stat.</th>
</tr>
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<tbody>
<tr>
<td>Heart rate/min</td>
<td>109 105 102 109 102</td>
<td>105.4±3.13</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>A(mv)</td>
<td>.9 .7 .8 19 .8</td>
<td>0.82±0.0748</td>
<td>NS</td>
</tr>
<tr>
<td>P wave -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D(sec)</td>
<td>.08 .09 .08 .08 .08</td>
<td>0.082±4x10⁻³</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>A(mv)</td>
<td>0.3 0.3 0.3 0.4 0.3</td>
<td>0.32±0.04</td>
<td>NS</td>
</tr>
<tr>
<td>Q wave -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D(sec)</td>
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<td>0.032±4x10⁻³</td>
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<tr>
<td>A(mv)</td>
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<td>0.54±0.0489</td>
<td>NS</td>
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<tr>
<td>R wave -</td>
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<td></td>
</tr>
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<td></td>
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<tr>
<td>T wave -</td>
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<tr>
<td>D(sec)</td>
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<td>0.148±9.79x10⁻³</td>
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<tr>
<td>ST segment</td>
<td>Depressed in all animals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P-R interval</td>
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<td>NS</td>
</tr>
<tr>
<td>QT</td>
<td>.25 .25 .27 .26 .27</td>
<td>0.268±9.79x10⁻³</td>
<td>NS</td>
</tr>
</tbody>
</table>

15.9 **Observation:**

There is slowing of heart rate, the mean values 113.8 ± 40.8, 105.8 ± 3.13 before and after digitalis. P value is highly significant i.e. < 0.01. The amplitude and duration of the waves remains same except the T wave. The amplitude of T wave is markedly decreased. The mean values were 1.04 ± 0.0489, 0.52 ± 0.04 before and after digitalisation and P value < 0.01 which is statistically significant.

ST segment is depressed in all animals

15.10 **Discussion:**

The experiment is done to see the effect of Digitalis in acute myocardial infraction. In clinical medicine digitalis is not a choice of drug in myocardial infraction. The experiment has immense value, as we do not know the effect of Digitalis in myocardial infraction.

The heart rate is slightly decreased, the mean values are 113.8 ± 40.8 and 105.4 ± 3.13 before and after digitalisation but P value is significant. The slight decrease is associated with increase P-R interval. The mean values are 0.102 ± 7.48x10⁻³, 0.11 ± 0 before and after digitalisation. Thus slowing of heart rate because of prolongation of P-R interval. This observation is quite compatible with Laurance, D.R. (1976) description. The shortened QT interval has been described by Schomroth, L. (1986) with digitalis, but in the present experiment the QT interval is slightly prolonged but not statistically significant.
The other most distinguished change is observed in the T wave. The amplitude of T wave is grossly affected. The values before and after digitalisation are $1.04 \pm 0.0489$, $0.52 \pm 0.04$ and P value $< 0.01$ which is statistically significant. Laurance, D.R. (1976) has described that the T wave becomes smaller, disappear and may become inverted. In the present experiment, the T wave is significantly smaller. Schamroth, L. (1976) has described that distal limb of T wave is not above the base line. In the present experiment, there is change in the distal limb which is almost to the base line.

Thus, the present experiment can be concluded that Digitalis causes significant lowering of heart rate, the amplitude of T wave is less and distal limb of T wave is distorted.
The effect of Calcium Chloride in Therapeutic dose after occlusion of left anterior descending coronary artery

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
<th>Value 4</th>
<th>Value 5</th>
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<th>Mean  ± SD</th>
<th>p-value</th>
<th>Significance</th>
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</thead>
<tbody>
<tr>
<td>Heart rate</td>
<td>124</td>
<td>120</td>
<td>116</td>
<td>116</td>
<td>120</td>
<td>119.2 ± 2.99</td>
<td>&lt; 0.05</td>
<td>Sig.</td>
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<tr>
<td>A(mv)</td>
<td>0.8</td>
<td>0.9</td>
<td>0.8</td>
<td>0.9</td>
<td>0.9</td>
<td>0.86 ± 0.0439</td>
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<td></td>
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<tr>
<td>R wave-</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>D(sec)</td>
<td>0.06</td>
<td>0.06</td>
<td>0.07</td>
<td>0.06</td>
<td>0.06</td>
<td>0.062 ± 4×10^{-3}</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A(mv)</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.38 ± 0.04</td>
<td>NS</td>
<td></td>
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</tr>
<tr>
<td>Q wave-</td>
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<td></td>
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<td></td>
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<td></td>
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<td>D(sec)</td>
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<td>0.03</td>
<td>0.024 ± 4.89×10^{-3}</td>
<td>&lt; 0.01</td>
<td>Sig.</td>
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<td>0.5</td>
<td>0.6</td>
<td>0.5</td>
<td>0.54 ± 0.0489</td>
<td>NS</td>
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<td>S wave-</td>
<td></td>
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<td></td>
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<tr>
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<td>0.04</td>
<td>0.04</td>
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<td>0.04</td>
<td>0.04 ± 0.0</td>
<td>NS</td>
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<tr>
<td>A(mv)</td>
<td>2.5</td>
<td>2.7</td>
<td>2.8</td>
<td>2.7</td>
<td>2.8</td>
<td>2.7 ± 0.1095</td>
<td>NS</td>
<td></td>
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</tr>
<tr>
<td>R wave-</td>
<td></td>
<td></td>
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<tr>
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<td>0.152 ± 9.79×10^{-3}</td>
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<td>T - Depressed</td>
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<td>0.09</td>
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<td>0.096 ± 8×10^{-3}</td>
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<tr>
<td>QT</td>
<td>0.23</td>
<td>0.24</td>
<td>0.25</td>
<td>0.25</td>
<td>0.23</td>
<td>0.24 ± 8.94×10^{-3}</td>
<td>NS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sig = Significant, NS = Nothing Significant.
15.12 **Observation:**

There is slight increase in heart rate. The mean values before and after Cacl$_2$ are 113.8 ± 40.8 and 119.2 ± 2.99 respectively and P value is <0.05 which is significant. The amplitude and duration of other waves remain same. There is change in ST segment. There is slight shortening of QT interval. The mean values are $0.256 \pm 8 \times 10^{-3}$, $0.24 \pm 8.94 \times 10^{-3}$ respectively and P value is not significant.

15.13 **Discussion:**

Calcium is sometime needed during I.V. fluid administration in moribund cases when the patient is not able to take orally. Naturally this experiment has immense clinical value.

There is increase in heart rate after administration of Cacl$_2$. QT interval is not statistically significant. The calcium level before and after administration remained 3.5 mEq/L and 3.7 mEq/L which is within physiological variation. Thus I.V. calcium infusion there is slight changes in Heart rate and QT interval.

Schamroth, L. (1986) and Goldman, M.J. (1988) have described the shortening of QT interval in Hypercalcaemia.

Thus this experiment can be concluded with following observation that I.V. Cacl$_2$ should be given very slowly otherwise the therapeutic dose may cause problems.
15.11 The effect of Potassium Chloride in Therapeutic dose after complete occlusion of left anterior descending coronary artery

<table>
<thead>
<tr>
<th>Parameter</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>P.V.</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart rate</td>
<td>120</td>
<td>124</td>
<td>124</td>
<td>116</td>
<td>116</td>
<td>120 + 3.57</td>
<td>&lt;0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td>P wave</td>
<td>0.5</td>
<td>0.6</td>
<td>0.4</td>
<td>0.5</td>
<td>0.4</td>
<td>0.48 ± 0.0748</td>
<td>&lt;0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>0.06</td>
<td>0.06</td>
<td>0.07</td>
<td>0.08</td>
<td>0.07</td>
<td>0.068 ± 7.18 x 10⁻³</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Q wave</td>
<td>Ioselectric</td>
<td>Ioselectric</td>
<td>Ioselectric</td>
<td>Ioselectric</td>
<td>Ioselectric</td>
<td>Ioselectric</td>
<td>Ioselectric</td>
<td>Ioselectric</td>
</tr>
<tr>
<td>R wave</td>
<td>0.4</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.3</td>
<td>0.34 ± 0.0489</td>
<td>&lt;0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>0.04</td>
<td>0.05</td>
<td>0.03</td>
<td>0.03</td>
<td>0.04</td>
<td>0.034 ± 4.89 x 10⁻³</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>S wave</td>
<td>0.15</td>
<td>0.16</td>
<td>0.18</td>
<td>0.18</td>
<td>0.18</td>
<td>0.17 ± 0.0126</td>
<td>&lt;0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02 ± 0.0</td>
<td>&lt;0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td>T wave</td>
<td>0.7</td>
<td>0.6</td>
<td>0.6</td>
<td>0.7</td>
<td>0.6</td>
<td>0.64 ± 0.0489</td>
<td>&lt;0.01</td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td>0.16</td>
<td>0.14</td>
<td>0.16</td>
<td>0.14</td>
<td>0.14</td>
<td>0.148 ± 9.79 x 10⁻³</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>ST segment</td>
<td>Depressed</td>
<td>Depressed</td>
<td>Depressed</td>
<td>Depressed</td>
<td>Depressed</td>
<td>Depressed</td>
<td>Depressed</td>
<td>Depressed</td>
</tr>
<tr>
<td>P-R</td>
<td>0.11</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
<td>0.102 ± 4 x 10⁻³</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>QT</td>
<td>0.24</td>
<td>0.23</td>
<td>0.23</td>
<td>0.24</td>
<td>0.25</td>
<td>0.238 ± 7.48 x 10⁻³</td>
<td>&lt;0.01</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

SD = Standard deviation  Sig. = Significant  NS = Nothing significant  P.V. = P Value
15.15 Observation:

There is slight increase in heart rate. The mean values before and after administration of Kcl are 113.8 ± 3.57 with P value <0.01 which is statistically significant. There is diminution of P wave and the mean values are before and after Kcl therapy 0.86 ± 0.0489 and 0.48 ± 0.0748 and P value is<0.01 which is statistically significant.

There is slight diminution of R wave the mean values are 0.56 ± 0.0489 and 0.34 ± 0.0489 but P value is<0.01 and is statistically significant.

The amplitudes of T wave before and after administration of Kcl are 2.64 ± 0.10 and 0.64 ± 0.0489 and P value is<0.01 which is statistically significant. T wave blends with QRS.

15.16 Discussion:

The experiment is done to see the effect of Therapeutic dose of Kcl. In clinical medicine the Kcl may be needed with coronary insufficiency. Just after administration there is increased in heart rate and is statistically significant.

The amplitude of P wave is diminished which is quite compatible with the finding of Schamroth, L. (1986).

There is diminution of Amplitude of R wave which is also same with the findings of Schamroth, L. (1986).

The amplitude of T wave is diminished and blends the QRS complex. The findings favour the finding of Schamroth, L.(1986).

The experiment can be concluded that Kcl causes prominent effect on P wave, R wave, T wave and slight increase in heart rate. Thus Kcl is to be administered very slowly in myocardial infraction.
VIIIA(a) The Bar diagram showing the heart rate changes after complete occlusion of LAD in Cat.
    The heart rate:
    Before occlusion - 105.4 ± 3.13
    After occlusion - 113.8 ± 4.08
    P value < 0.01

VIIIA(b) The Bar diagram showing the P wave changes after occlusion of LAD in Cat.
    The amplitude of P wave
    Before occlusion - 0.54 ± 0.0489
    After occlusion - 0.86 ± 0.489
    P value < 0.01

VIIIA(c) The Bar diagram showing the R wave changes after occlusion of LAD in Cat.
    The amplitude of R wave
    Before occlusion - 0.96 ± 0.0489
    After occlusion - 0.56 ± 0.0489
    P value < 0.01

VIIIA(d) The Bar diagram showing the T wave changes after occlusion of LAD in Cat.
    The amplitude of T wave (in mv.)
    Before occlusion - 0.52 ± 0.0748
    After occlusion - 1.04 ± 0.0489
    P value < 0.01
The effect after occlusion of LAD in Cat.
VIII.B(a) The Baridagram showing the heart rate after Nifedipine therapy after complete occlusion of LAD in Ca:

The heart rate:

Before Nifedipine therapy = 113.8 ± 4.08
After Nifedipine therapy = 124.8 ± 1.6
P value < 0.01

VIII.B(b) The Baridagram showing the P wave changes after Nifedipine therapy after complete occlusion of LAD in Ca:

The amplitude of P wave (in mv.)

Before Nifedipine therapy = 0.86 ± 0.0489
After Nifedipine therapy = 1.16 ± 0.0489
P value < 0.01

VIII.B(c) The Baridagram showing the R wave changes after Nifedipine therapy after complete occlusion of LAD in Ca:

The amplitude of R wave (in mv.)

Before Nifedipine therapy = 0.56 ± 0.0489
After Nifedipine therapy = 0.84 ± 0.0489
P value < 0.01

VIII.B(d) The Baridagram showing the Q wave changes after Nifedipine therapy after complete occlusion of LAD in Ca:

The amplitude of Q wave (in mv.)

Before Nifedipine therapy = 0.38 ± 0.04
After Nifedipine therapy = 0.22 ± 0.04
P value < 0.01

VIII.B(e) The Baridagram showing the S wave changes after Nifedipine therapy after complete occlusion of LAD in Ca:

The amplitude of S wave (in mv.)

Before Nifedipine therapy = 2.64 ± 0.10
After Nifedipine therapy = 1.78 ± 0.0979
P value < 0.01

VIII.B(f) The Baridagram showing the QT interval after Nifedipine therapy after complete occlusion of LAD in Ca:

The QT interval (in sec.)

Before Nifedipine therapy = 0.256 ± 8x10^{-3}
After Nifedipine therapy = 0.216 ± 4.89x10^{-3}
P value < 0.01
The effect of Nifedipine after complete occlusion of LAD in Cat

VIIIIB(a)
- Before Nifedipine
- After Nifedipine

VIIIIB(b)

VIIIIB(c)
- After Nifedipine
- Before Nifedipine
The effect of Nifedipine complete occlusion of LAD in Cat

VIII B (a)
- Before Nifedipine
- After Nifedipine

VIII B (b)

VIII B (c)
- Before Nifedipine
- After Nifedipine
VIIIC(a) The Bardiagram showing thenheart rate changes a
Digitalis therapy after complete occlusion of LAD in Cat
The heart rate:
Before digitalis therapy  - 113.8 ± 4.08
After digitalis therapy  - 105.4 ± 3.13
P value <0.01

VIIIC(b) The bardiagram showing the changes in P-R inter
after digitalis therapy after complete occlusion of LAD
The P-R interval (in sec.)
Before digitalis therapy  = 0.102 ± 7.48x10^-3
After digitalis therapy  = 0.11 ± 0
P value <0.05

VIIIC(c) The Bardiagram showing the T wave changes after
digitalis therapy after complete occlusion of LAD in Cat
The amplitude of T wave (in mv.)
Before digitalis therapy  - 1.04 ± 0.0489
After digitalis therapy  - 0.52 ± 0.04
P value <0.01
The effect of Digitalis after complete occlusion of LAD in Cat.

- **VIIIIC(a)**
  - Before Digitalis
  - After Digitalis

- **VIIIIC(b)**
  - Before Digitalis
  - After Digitalis

- **VIIIIC(c)**
  - Before Digitalis
  - After Digitalis
VIII(b) The Baradogram showing the heart rate changes after Calcium chloride therapy after complete occlusion of LAD:

The heart rate:

Before Cacl$_2$ therapy - 113.8 ± 4.08
After Cacl$_2$ therapy - 119.2 ± 2.99
P value < 0.05

VIIIId(b) The Baradogram showing the QT changes after Calcium chloride therapy in complete occlusion of LAD in Cat.

The QT changes (in sec.)

Before Cacl$_2$ therapy - 0.256 ± 8x10$^{-3}$
After Cacl$_2$ therapy - 0.24 ± 8.9 x10$^{-3}$
P value < 0.05
The effect of Calcium Chloride after complete occlusion of LAD in Cat.

VIIID(a)

- □ Before CaCl₂
- ■ After CaCl₂

VIIID(b)

- □ After CaCl₂
- ■ Before CaCl₂
VIII.E(a) The bar diagram showing the heart rate changes after Potassium chloride therapy after complete occlusion of LAD in Cat.

The heart rate:
- Before Potassium chloride therapy: 113.8 ± 4.08
- After Potassium chloride therapy: 120 ± 3.57
- P value < 0.01

VIII.E(b) The bar diagram showing the P wave changes after Potassium chloride therapy after complete occlusion of LAD in Cat.

The amplitude of R wave (in mv.):
- Before Potassium chloride therapy: 0.86 ± 0.048
- After Potassium chloride therapy: 0.48 ± 0.074
- P value < 0.01

VIII.E(c) The bar diagram showing the R wave changes after Potassium chloride therapy after complete occlusion of LAD in Cat.

The amplitude of R wave (in mv.):
- Before Potassium chloride therapy: 0.56 ± 0.0489
- After Potassium chloride therapy: 0.34 ± 0.0748
- P value < 0.01

VIII.E(d) The bar diagram showing the T wave changes after Potassium chloride therapy after complete occlusion of LAD in Cat.

The amplitude of T wave (in mv.):
- Before Potassium chloride therapy: 1.04 ± 0.0485
- After Potassium chloride therapy: 0.64 ± 0.0485
- P value < 0.01
The effect of Potassium chloride after complete occlusion of LAD in Cat

VIIIIE(a)  
- Before KCl
- After KCl

VIIIIE(h)  
- Before KCl
- After KCl

VIIIIE(c)  
- Before KCl
- After KCl

VIIIIE(d)  
- Before KCl
- After KCl
XV. E.C.G. CHANGES IN RELATION TO FOUR DRUGS
IN ISCHAEMIC CONDITION OF CAT HEART

Fig. 1
In normal condition

Fig. 2
In Ischaemic condition

Fig. 3
After Nifedipine Therapy

Fig. 4
After Digitalis Therapy

Fig. 5
After Calcium Chloride Therapy

Fig. 6
After Potassium Chloride Therapy