# Study of Lipoprotein Profile in Myocardial Infarction

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SUMMARY

Serum cholesterol and lipoprotein levels were measured in thirty patients of myocardial infarction (23 males and 7 females) admitted to a coronary care unit Mayo Hospital Lahore. The patients were divided into two main groups, which were further classified in various subgroups according to age. The results were compared with eighteen healthy males and five female subjects. The serum cholesterol was higher in all age groups in patients than in normal controls. The HDL cholesterol concentration was lower in patients with different age groups of either sex when compared with healthy controls. The inverse relationship of HDL cholesterol in patients with myocardial infarction was evident.

## Introduction:

It is well established that there are four major risk factors, i.e., hypercholestrolaemia, hypertension, heavy cigarette smoking and diabetes mellitus which lead to the development of atherosclerosis. Among these the best documented one is the correlation between blood lipid levels and coronary heart disease. Large body of evidence exist which shows an association between serum cholesterol level and ischaemic heart disease. Increased triglyceride concentration in the blood also shows an association with the risk of coronary heart disease, however it is a much weaker independent risk factor.

Recently it has been shown that cholesterol associated with high density lipoproteins shows an inverse relationship with the incidence of coronary heart disease. This means that elevated levels of HDL-c may have a protective action against coronary atherosclerosis. Our aim was to confirm the recently developed idea that HDL-c bears a negative correlation with the occurrence of coronary heart disease.

## Materials and Methods:

The present study of lipoprotein profile was undertaken on 30 patients of myocardial infarction of both sexes between 35-65 years of ages. The cases selected were the once admitted to the coronary care unit Mayo Hospital Lahore. Control group included 18 age matched males and 5 females. In each case a detailed history was obtained and appropriate physical examination was performed. Serial Electrocardiograms were recorded in every patient. The data was collected on special proforma and was analysed by student "t" test.

4-5ml blood was collected from the anterior cubital vein of each patient with disposable syrings within 24 hours of admission. The blood was allowed to clot. The collected blood was poured into centrifuge tubes and centrifuged at 3000 rpm. The serum thus separated was analysed for levels of cholesterol, chylomicrons, LDL, VLDL and HDL. The lipoproteins were determined by kits of Kikenchemical Company.

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Grouping of Subjects:

Male and female patients were labelled as group A & B while male and female controls were grouped as E and F respectively. To find the effect of age on various lipid parametes in patients with cardiac infarction male patients were categorised into groups $A_1$, $A_2$, $A_3$ while the female patients were divided into groups $B_1$ and $B_2$ respectively.

Results:

Statistical significance of results was assessed by student "t" test. Significantly high values of cholesterol, VLDL and chylomicrons ($P < .01$), $P < .001$, $P < .05$) were obtained in group A as compared with group E. The difference in LDL between these two groups however, was not statistically significant. Similarly the difference in these parameters except chylomicrons between group B and F was highly significant. Significantly high values of serum cholesterol, VLDL and chylomicrons were found in group $A_1$ and $A_2$ as compared with group E. The HDL—c values were significantly lower ($P < .001$) in patients group compared with normal controls. No statistically significant difference was noticed in serum cholesterol and chylomicron values in group $A_3$ and E, however LDL and VLDL values were significantly lower in patients. Significantly high values of serum cholesterol were present in group $B_1$ and $B_2$ as compared with group F. The difference in chylomicron values in these groups however were not statistically significant. However, HDL—c levels were lower, in patients than in normal controls.

Discussion:

The serum cholesterol and lipoprotein levels on the morning after myocardial infarction showed a significant difference between the cases and control group. It is an established fact that hypercholestrolaemia is one of the major risk factor which leads to the development of atherosclerosis.

In all the three and two age groups in males and females respectively the mean cholesterol levels were higher than in the normal group. However, this difference was statistically significant before the age of sixty-five. These findings are confirmity with those reported by Oliver and

TABLE — I

SERUM CHOLESTEROL AND LIPOPROTEIN LEVELS IN CONTROLS & PATIENTS WITH MYOCARDIAL INFARCTION.

| GROUP. | AGE. | CHOLESTROL mg/dl. | HDL—c mg/dl/. | LDL mg/dl. | VLDL mg/dl. | CHYLOMICRONS. mg/dl. |
|---|---|---|---|---|---|---|
| A (23) | 35-85 | 25.3.58+52 | 24.6+5 | 271.9+82 | 219+103 | 116.52 |
| E (18) | 35-85 | 188.62+45 | 43.4+6 | 237.97+60 | 124.4+56 | 74.4+54 |
| B (7) | 35-66 | 220.61+65<br>P 0.01 | 25.47+6<br>P 0.001 | 303.98+82<br>NS | 224+64<br>P 0.001 | 100.5+57<br>PLO .05 |
| F (5) | 35-66 | 136.76+18<br>P 0.001 | 45.7+4<br>P 0.05 | 195.78+67<br>P .05 | 77.35+72<br>P .01 | 50.8+42<br>NS |

A = male patients. B = female patients.
B = male control F = female controls.
n = number of subjects.

The values are expressed as mean + SD.
NS= Non significant.

TABLE -II

SERUM CHOLESTEROL AND LIPOPROTEIN LEVELS IN MALE CONTROLS & MALE PATIENTS WITH MYOCARDIAL INFARCTION.

| | PATIENTS. | | | CONTROLS. |
|---|---|---|---|---|
| Age group. | 35-50 n=10 | 51-56 n=9 | 73-85 n=4 | 35-85 n=18 |
| Cholesterol. | 240.4+63 P <.05 | 231.9+42 P <.05 | 219+39 NS | 188.6+45 |
| HDL–c mg/dl. | 25.2+5 P <.001 | 25.0+7 P <.001 | 21.8+1.5 P <.001 | 43+5.75 |
| LDL mg/dl. | 280+85 NS | 242.6+72 NS | 21.8+1.5 P <.05 | 231.9+59 |
| VLDL mg/dl. | 207.7+32 p <.001 | 116.9+63 P <.01 | 215.3+51 P <.001 | 124.4+57 |
| Chylomicrons. | 114.2+61 P <.01 | 113+43 P .01 | 102+44 NS | 74.4+54 |

A = 35-50 years of age.
$A_2$ = 51-66 years of age.
$A_3$ = 73-85 years of age.

TABLE – III.

SERUM CHOLESTEROL AND LIPOPROTEIN LEVELS IN FEMALE CONTROLS AND FEMALE PATIENTS WITH MYOCARDIAL INFARCTION.

ACCORDING TO DISTRIBUTION OF AGE.

| | PATIENTS. | | CONTROLS. |
|---|---|---|---|
| Age Group in years | 35-50 (3) | 51-66 (4) | 35-60 (5) |
| CHOLESTEROL mg/dl. | 215.7+68 P <.01 | 225+57 P <.01 | 136.8+18 |
| HDL–c | 26.5+6.4 P <.01 | 24.7+6.3 P <.001 | 45.7+4 |
| LDL mg/dl. | 324.2+73 P <.05 | 238.8+85 P <.01 | 195.8+67 |
| HDL–c mg/dl. | 219+36.2 P <.02 | 227.9+78 P <.05 | 74.4+72 |
| CHYLOMICRONS. | NS | NS | |

$B_1$ = 35-50 year of age. (Female patients).
$B_2$ = 51-66 year of age. (Female patients).
F = 35-66 year of age. (Female controls.)
NS = Not significatn.

The figures in parenthesis show the number of subjects studied in each group.

Boyd and Lawry et al, who found that young cornaries had higher cholesterol levels than older ones and that at about the age of 60 no difference in serum cholesterol level was apparent one, as compared with normal controls.

Barr et al were the first to study the concentration of high density lipoprotein cholesterol in patients with coronary heart disease. They found reduced amount of HDL–c in these patients. Low values of HDL–c were also reported by Nikkila and Jenck et al using paper electrophoreses. Miller and his coworkers in a case control study found that serum high density lipoprotein cholesterol concentration was 35 per cent lower in coronary heart disease patients as compared with control subjects. The data of the present study duplicates these findings and the patients in this study showed about 40 per cent lower HDL–c concentration as compared to the control population.

In conclusion the present preliminary study indicates that there is inverse relationship between HDL– Cholesterol and serum B lipoproteins and further HDL–Cholesterol has negative association with the risk of coronary heart disease.

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