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# A Research Article on Siginificance of Lipid Profile in Cardiovscular Diseases

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## ABSTRACT

**Introduction**: Due to poor diet and lifestyle choices that negatively impact people's health, cardiovascular diseases (CVDs) are the major cause of death and morbidity in India. CVD rates are expected to rise in the future due to a lack of knowledge and preventive measures. One tactic to lessen the risk of CVD is to take a combo pill (Simvastatin, Lisinopril, Hydrochlorothiazide, Aspirin), which contains antiplatelet, cholesterol-lowering, and blood pressure-lowering agents, respectively.

**Methodology:** Participants who have at least one risk of CVD (dyslipidemia or hypertension) are chosen, and they are given the combo medication once daily for eight weeks. Once a week, their lipid profiles, ECG, blood pressure, and other parameters are taken for analysis.

**Results & Conclusion:** The combination pill's effectiveness was evaluated by looking at how much it reduced TG, TC, LDL-C, and blood pressure while simultaneously raising HDL levels. Consequently, it was discovered that the combo pill had the highest level of safety with the fewest possible adverse effects, making it effective in treating individuals with hypertension, dyslipidemia, or coronary artery disease.

**Keywords:** Cardiovascular disease, Dyslipidemia, Hypertension, Combination pill

## I. INRODUCTION

The subcontinent of India is expected to see a cardiovascular disease (CVD) epidemic due to changes in lifestyle and demography, as well as the impact of undernutrition during children on adult diseases [1]. Over the past 20 years, there has been a steady rise in the prevalence of ischemic heart disease in India [2,3]. Comprehensive public health initiatives at the individual and population levels will be necessary to reduce CVD [4]. Nowadays, nearly all of these high-risk people should be treated with three groups of CVD medications: antiplatelet, blood pressure lowering, and cholesterol reducing medicines, according to international guidelines [5,6,7].

**Potential to improve adherence with new, low-cost combination medication:**

Treatment gaps can be caused by a variety of factors, such as low adherence brought on by the cost, complexity, and stigma associated with taking one or more separate cardiovascular (CV) drugs, as well as ineffective dissemination and acceptance of guidelines [8,9]. Easy-to-afford combination medications could be a significant opportunity to enhance the availability and adherence to efficient CV treatment [10,11]. A strategy of impersonal interventions such as dietary salt reduction and the use of combination therapy based on absolute risk can reduce CV events by more than 50% [12].

## DYSLIPIDEMIA

Dyslipidemia is defined as abnormality in lipid metabolism leads to increased elevation of disorder of lipoprotein metabolism, including lipoprotein over production or deficiency [13]. There is strong relationship between elevated cholesterol levels and the genesis of coronary heart disease. Coronary artery disease yet remains one of the major killers in the current society [14].

Hyperlipidemia can be divided into, 1. Primary Hyperlipidemia, 2. Secondary Hyperlipidemia

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1. **Primary hyperlipidemia (familial; hereditary):** It is genetically determined [15].

**Types of primary hyperlipidemia [15]**

| Class | Increased lipoprotein | Synonym |
|---|---|---|
| Type I | ↑ Chylomicrons | Familial chylomicronemia |
| Type IIa<br>Type IIb | ↑ LDL<br>↑ LDL & VLDL | Familial Hypercholesterolemia<br>Familial combined hyperlipidemia |
| Type III | ↑ IDL | Familial dis-beta lipoproteinemia |
| Type IV | ↑ VLDL | Familial hypertriglyceridemia |
| Type V | ↑ VLDL & Chylomicrons | Familial mixed hyperlipidemia |

**2. Secondary hyperlipidemia:** Secondary hyperlipidemia is attributed to some other reasons like Diabetes mellitus, hyperthyroidism, chronic renal failure, glucagon storage disease, stress etc.,

**Optimal, Borderline, and high levels for each component [16]**

| ELIMENT | OPTIMAL | BORDERLINE | HIGH RISK |
|---|---|---|---|
| LDL cholesterol | <100 | 130-159 | 160+ |
| HDL cholesterol | >60 | 35-45 | <35 |
| Triglycerides | <150 | 150-199 | >200 |
| Total cholesterol | <200 | 200-239 | >240 |
| Cholesterol to HDL ratio | <4 | 5 | >6 |

**Diagnosis:** serum lipid profile is used for measuring total cholesterol, TG & HDL cholesterol and calculated LDL cholesterol and VLDL.

**Treatment strategies [17]:**

1. Dietary therapy
2. Exercise and stress reduction.
3. Drug therapy

**a. Statins-**HMG CoA reductase inhibitors: Lovastatin, Simvastatin, Atorvastatin.

**b. Bile acids binding resins:** Cholestyramine, Colespitol

**c. Fibrates & derivatives-** Benzfibrate, Clofibrate, Ciprofibrate.

**d. Nicotinic acid**

**e. Fish oil**

**f. Cholesterol absorption inhibitor:** Ezeimibe

**Adverse effects of statins: "**Rhabdomyolysis" is most serious adverse effect from statin use, though it occurs quite rarely (less than 0.1%).

**Adverse drug reactions:** Headache, dizziness, physically weak or unusually tired, sleep problems, low blood platelet count, feeling sick, diarrhea, indigestion.

## II. EPIDEMIOLOGY

In recent years the total global mortality has been having the dominance of chronic diseases as major contributors. By 2005, the total number of CVD deaths mainly (coronary heart disease, rheumatic heart disease and stroke) had increased globally to 17.5 million from 14.4million in 1990. In those 5.7million were attributed to stroke and 7.6million to coronary heart disease. Out of those the low income and middle countries had more than 80% of deaths. There will be 20million CVD deaths 2015, accounting for 30% of all deaths worldwide was estimated by the World Health Organization (WHO). By 2030, researches project that non-communicable diseases will account for more than three-quarters of deaths worldwide; in low-income countries more deaths will be responsible because of CVD than any other infectious diseases. Thus, the largest single contributor to global mortality will be CVD and will continue to dominate mortality trends in the future [4].

## III. OBJECTIVES

- To select the cardiovascular patient with lipid profile abnormality.

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- Comparison of lipid profile with standard guidelines NCEP ATP III.
- To categorize the patients based on the lipid profile.
- To find out the risk factors for cardiovascular disease.

## IV. METHODOLOGY

Patients aged 18-75 years with at least one factor for CVD namely Hypertension ≥139/89mm of Hg and ≤ 180/110mm of Hg according to JNC-VII guidelines and lipid profile LDL-C ≥130mg/dl or LDL-C >100mg/dl with CVD equivalent or patients with Coronary Artery Disease or high CV risk factors given combination pill i.e., Aspirin 75mg, Hydrochlorothiazide 12.5mg, Simvastatin 10mg, Lisinopril 5mg.

Low Dose pill taken once daily increased to medium dose, if necessary. The selected eligible patents are subjected for screening of blood and urine samples which were sent for the baseline safety investigation every 1st,4th ,8th and 12th week .In order to determine the efficacy of the drug combination the principle parameters are observed along with the other parameters, induces; blood pressure 120/80 mm of Hg LDL-cholesterol <100 mg/dl, Total triglycerides <200 mg/dl the heart rate is 60-70 beats/minute .The major parameter to asses cholesterol, and Total glycerides levels in 4 visits were evaluated by ANOVA. The comparative significance is tested and should be less than 0.05.

**DATA- ANALYSIS**

The major parameters for assessment of efficacy of the drug combinations were LDL cholesterol and tri-glycerides levels in 4 visits, which were collected and evaluated by using SPSS.

## V. RESULTS AND DISCUSSON

Total number of patients enrolled were 30 as per the study protocol. The total number of patients successfully completed the study were 27 as per the inclusion and exclusion criteria. Their LDL-C, Triglycerides, total cholesterol and HDL levels are compared with means of 4 visits.

**Efficacy of Combination Pill on Hyperlipidemia**

| | LDL-C | | Triglycerides | | Total Cholesterol | | HDL | |
|---|---|---|---|---|---|---|---|---|
| | Visit-1 | Mean Visit 2,3and4 | Visit-1 | Mean Visit 2,3and4 | Visit-1 | Mean Visit 2,3and4 | Visit-1 | Mean Visit 2,3and4 |
| **Moderate Hypertensive (n=23)** | 150.60±5.119 | 102.96±2.936*** | 209.21±16.047 | 153.30±8.95** | 217.60±6.25 | 169.4±4.30*** | 41.39±2.04 | 49.73±1.99** |
| **Severe Hypertensive (n=4)** | 221.5±6.33 | 181.8±6.414** | 156.0±3.93 | 99.3±7.52*** | 216.75±8.51 | 149.12±11.8** | 35.50±3.06 | 57.9±3.64** |

n values are given as mean ±SEM

**, *** Values are statistically significant compared to Visit 1(Base line) at P<0.01, P<0.001 respectively.

**DISCUSSION:**

The efficacy of combination pill on moderate systolic HTN patients was shown that P<0.05 (P=0.001). The combination pill was considered as effective. So, the combination pill shows higher efficacy on systolic and diastolic BP higher levels and doesn't show any side effects during and 4 visits. And also, the combination pill on levels on TC levels in patients show P<0.05 (P=0.001), LDL-C levels in patients shows P<0.05 (P=0.001), Triglycerides levels in patients shows P<0.05 (P=0.004) and HDL levels in patients shows P<0.05 (P=0.005). So that the combination pills shows higher efficacy and the drug has increased the levels of TC, LDL-C, Triglycerides and HDL levels and doesn't show any side effects during 4 visits.

## VI. CONCLUSION

The regular check-up mast cell process may improve the condition of cardiovascular patients. Therefore, combination pills have been found to have maximum safety with minimal side effects and are useful in treating patients with high blood pressure, dyslipidemia, or coronary artery disease.

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