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EFFECT OF STATINS IN CARDIOVASCULAR DISEASES: A PROSPECTIVE OBSERVATIONAL STUDY

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Abstract

Cardiovascular diseases also called heart diseases which include a group of disorders of the heart and blood vessels. Cardiovascular diseases (CVDs) are the leading cause of death globally. The study was aimed to explore the effect of statins in cardiovascular diseases-chronic stable angina, acute coronary syndrome and in post PTCA patients by monitoring the lipid profile. The study was conducted in the Cardiology department in the Queen's NRI Hospital. This is a prospective, non-interventional and observational study and 100 populations attending Cardiology OPD & IPD in Queen's NRI Hospital were recruited into the study with their informed consent. This research reported that the cardiovascular diseases in male with prevalence (63%) out of 100 patients and female with prevalence (37%) out of 100 and the prevalence of CSA is 15%, post PTCA is 21%, and ACS is 64% from a total estimation of the study. By using Paired T test the mean difference, estimated variance, standard error of difference, test statistic, test critical are calculated and the comparison between test statistic and critical value. The test statistic is greater than critical t value the alternate hypothesis is accepted by taking the level of significance α = 0.05 and p value less than 0.05 and there is a significant change in lipid profile parameters by using the statins and hence the study is statistically significant with positive outcome.

***Keywords*:** Cardiovascular diseases**,** prospective**,** Cardiology, statins**,** chronic stable angina.

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1. Introduction

Cardiovascular diseases also called heart diseases which include a group of disorders of the heart and blood vessels [1,2]. Cardiovascular diseases (CVDs) are the leading cause of death globally. An estimated 17.9 million people died from CVDs in 2019, representing 32% of all global deaths. Of these deaths, 85% were due to heart attack and stroke. Over three quarters of CVD deaths take place in low and middle income countries. Out of the 17 million premature deaths (under the age of 70) due to non communicable diseases in 2019, 38% were caused by CVDs [3]. Most cardiovascular diseases can be prevented by addressing behavioral risk factors such as tobacco use, unhealthy diet and obesity, physical inactivity and harmful use of alcohol. It is important to detect cardiovascular disease as early as possible so that management with medicines and counseling can begin [4,5]. The key to cardiovascular disease reduction lies in the inclusion of cardiovascular disease management interventions in universal health coverage packages, although in a high number of countries health systems require significant investment and reorientation to effectively manage CVDs [6]. Basic medicines that should be available include: aspirin; beta-blockers; angiotensin-converting enzyme inhibitors; and statins [7-9]. The study was aimed to explore the effect of statins in cardiovascular diseases-chronic stable angina, acute coronary syndrome and in post PTCA patients by monitoring the lipid profile. The primary objective of this study was to analyze the effects of treating the patients with statins in those with risk factors of cardiovascular diseases and as a function of secondary prevention. The secondary objective of this study was to analyze the benefits of treating the patients with statins in those having mean low-density lipoprotein cholesterol (LDL-C) in the near-optimal to borderline high range.

2. Materials and Methods

The study was conducted in the Cardiology department in the Queen's NRI Hospital. This is a prospective, non-interventional and observational study and 100 population attending Cardiology OPD & IPD in Queen's NRI Hospital were recruited into the study with their informed consent. The study was conducted in the Queen's NRI Hospital, Visakhapatnam, for a period of 6 months. A specially designed data collection format was used to collect all the details of information like IP/OP numbers, Age, Gender, date of admission, date of discharge, Reason for admission, History of present illness, Past Medical History, Past medication History, Laboratory tests, diagnosis, and treatment.

Patient selection: The selection of patients involves the following,

I. Inclusion criteria

Only those patients who were diagnosed with cardiac disorders were recruited from Cardiology OPD & IPD and included in the study.

- Patients of both genders were considered.
- Smokers, alcoholics were included in this study.
- Patients with co-morbidities were also included in this study.
- Patients > 18 years of age were considered.
- Patients who have undergone PTCA procedures were included.

II. Exclusion criteria

- Pregnancy women and terminally ill were excluded.
- Children and neonates were excluded.
- Patients who are not willing to participate in our study were excluded.
- Seriously and mentally ill patients were excluded.
- Covid 19 patients were excluded.

➢ Statistical Analysis

Collected data was entered in Microsoft Office Excel 2010 and analysed. Descriptive statistics explained using frequencies, tables and percentages. Paired two tail T-test is used for the variables to test the hypothesis using degree of freedom and level of significance of 0.05. Pearson Coefficient is also used to test the correlation between the lipid profile range before and after administration of statins. Statistical significance was considered at p-value less than 0.05. If your P value is less than the chosen significance level then you reject the null hypothesis i.e. accept that your sample gives reasonable evidence to support the alternative hypothesis [10, 11].

➢ Ethical Clearance

Ethical permission to conduct the hospital based study was obtained from Institution Ethics Committee before commencement of the study. Subject confidentiality was maintained during and after data collection.

3. Results and Discussion

Out of 100 elderly patients admitted in the hospital during study period 63 (63.0%) were males and 37 (37%) were females. Total admitted elderly patients were classified based on the cardiovascular diseases like chronic stable angina, acute coronary syndrome, and post PTCA patients and represents 15% (N=15), 64% (N=64), 21% (N=21) of total study population respectively.

Table 1. Gender wise distribution of elderly patients admitted under department of cardiology with cardiovascular diseases.

GENDER	NUMBER	PERCENT
Males	63	63%
Females	37	37%
Total	100	100%

Table 2. Disease wise distribution in elderly patients who have admitted in department of cardiology

DISEASE	NUMBER	PERCENT
Chronic stable angina	15	15%
Acute coronary syndrome	64	64%
Post PTCA	21	21%

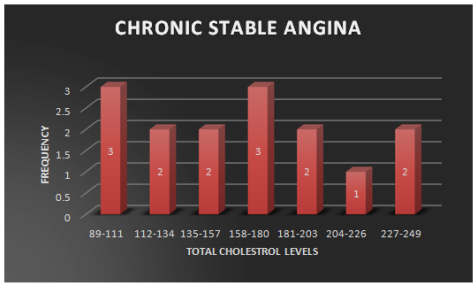
Table 3. Estimation of lipid profiles before and after the Treatment with statins among different patients

DRUG ADMINISTERED	NUMBER	PERCENT
ATORVASTATIN	58	58%
ROSUVASTATIN	42	42%

As this study is based on the effect of statins on the various lipid profile parameters the before and after results are divided on the basis of class intervals of various lipid profile levels and the changes are recorded in graphical method using bar diagrams.

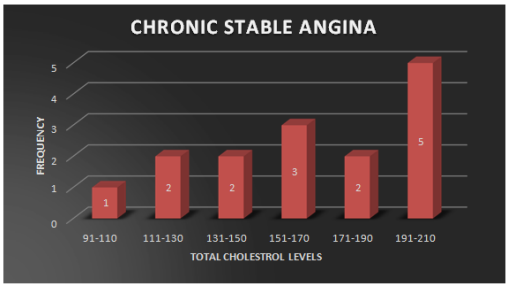
Chronic Stable Angina Patients

Before Using Statins



X-AXIS=TOTAL CHOLESTROL LEVELS
Y-AXIS=FREQUENCY

After Using Statins



X-AXIS=TOTAL CHOLESTROL LEVELS
Y-AXIS=FREQUENCY

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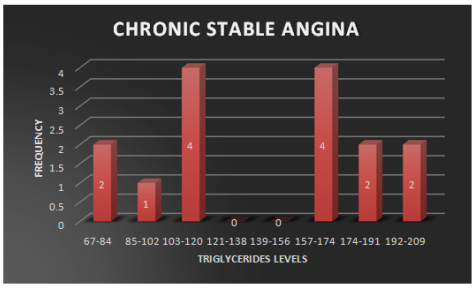
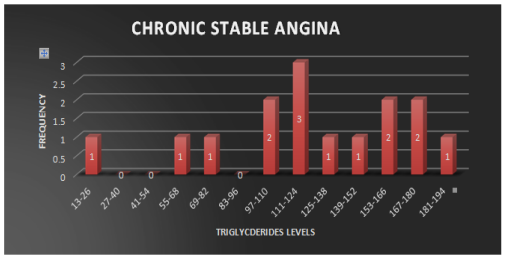


X-AXIS=TRIGLYCERIDES LEVELS
Y-AXIS=FREQUENCY

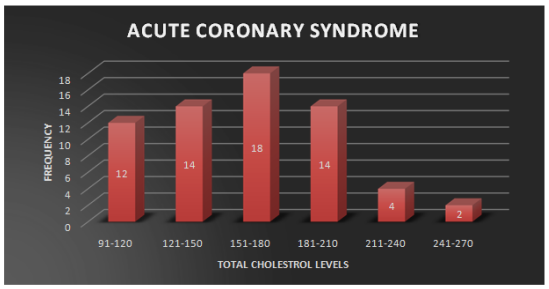
after Using Statins



X-AXIS=TRIGLYCERIDES LEVELS
Y-AXIS=FREQUENCY

Acute Coronary Syndrome

Before Using Statins



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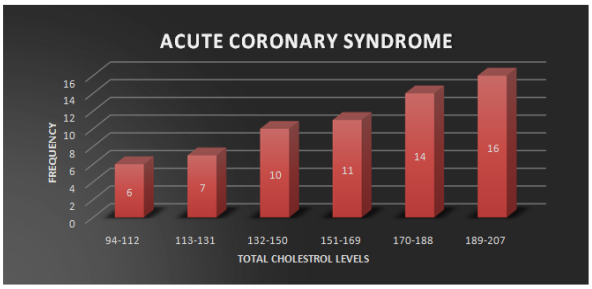
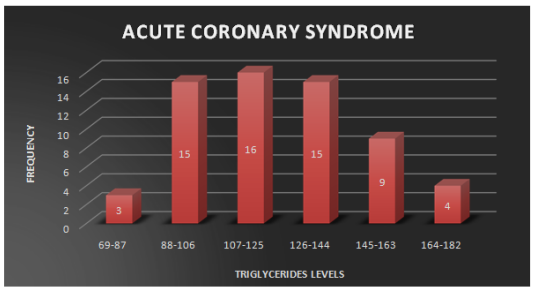
After Using Statins



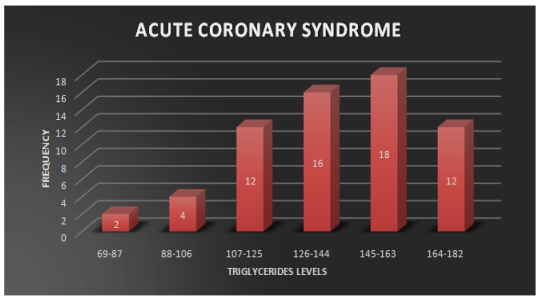
X-AXIS=TOTAL CHOLESTROL LEVELS
Y-AXIS=FREQUENCY

Before Using Statins

After Using Statins



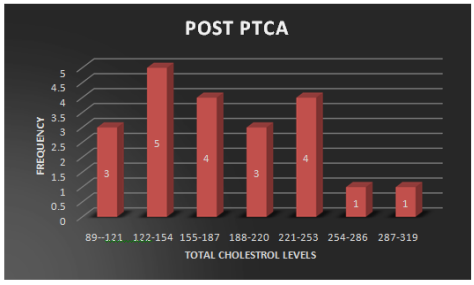
X-AXIS=TRIGLYCERIDE LEVELS
Y-AXIS=FREQUENCY



X-AXISTRIGLYCERIDE LEVELS
Y-AXIS=FREQUENCY

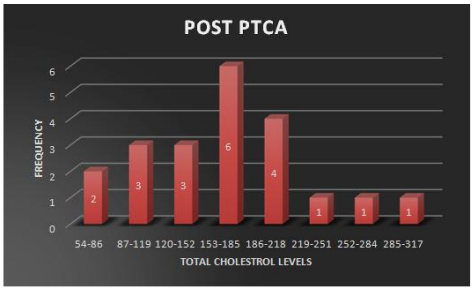
POST PTCA

Before Using Statins



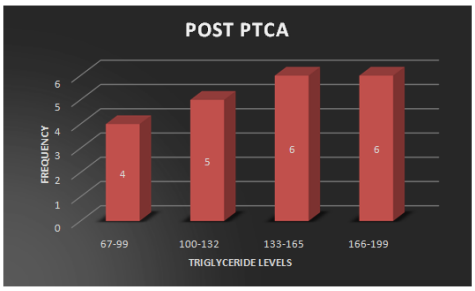
X-AXIS=TOTAL CHOLESTROL LEVELS
Y-AXIS=FREQUENCY

After Using Statins



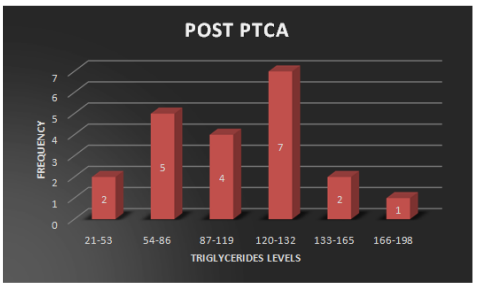
X-AXIS=TOTAL CHOLESTEROL LEVELS
Y-AXIS=FREQUENCY

Before Using Statins



X-AXIS=TRIGLYCERIDE LEVELS
Y-AXIS=FREQUENCY

After Using Statins



X-AXISTRIGLYCERIDE LEVELS
Y-AXIS=FREQUENCY

The study was conducted in 100 elderly patients who was diagnosed with CSA, ACS and Post PTCA who were attending cardiology department of Queen's NRI Hospital. A Hospital based Prospective observational cohort study was carried out in a period of six months on subjects selected as per criteria and checked or evaluated for lipid profile whether it is increasing or decreasing by using the statin medication.

Conclusion

This research reported that the cardiovascular diseases in male with prevalence (63%) out of 100 patients and female with prevalence (37%) out of 100 and the prevalence of CSA is 15%, post PTCA is 21%, and ACS is 64% from a total estimation of the study. By using Paired T test the mean difference, estimated variance, standard error of difference, test statistic, test critical are calculated and the comparison between test statistic and critical value. The test statistic is greater than critical t value the alternate hypothesis is accepted by taking the level of significance $\alpha = 0.05$ and p value less than 0.05 and there is a significant change in lipid profile parameters by using the statins and hence the study is statistically significant with positive outcome.

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Conflicts of Interest

The authors declare no conflicts of interest.

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