

# Gender Factor Effects on Compliance of Statin Therapy in Hyperlipidemia Patients

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## ABSTRACT

**Background:** The biggest cause of death worldwide is cardiovascular disease (CVD), which accounts for 31% of all fatalities that are officially reported each year. Hyperlipidemia is thought to be a key risk factor for CVD. Due to the lack of symptoms associated with hyperlipidemia, many patients do not feel the need to take medication. Undoubtedly, treating and managing the hypercholesterolemia and other diseases with no symptoms has been difficult for both patients and medical professionals.

**Methodology:** Study was conducted in co-operation of department of Cardiology & Medicine PMC Hospital Nawabshah. 100 patients were registered having hyperlipidemia, included through convenience sampling technique. Two groups were made age from 31-50 years and other age from 51 to 70 years. Drug compliance was measured by using Morisky scale and detailed history by using the pre-formed proforma.

**Results:** Result showed there was compliance of statin therapy in both genders PDC was more than 80%, but in comparison of both groups statin therapy compliance was statistically non-significant p value-0.726.

**Conclusion:** The majority of the participants in this study who had hyperlipidemia adhered to their statin medication. The factors determining compliance revealed good adherence in the high-risk population, especially in people over 50 years old.

**Keywords:** Gender, compliance. Statin therapy. Hyperlipidemia.

## INTRODUCTION

Compliance of drugs or treatment refers to the extent or degree of adherence to the provider's daily treatment instructions with regard to schedule, frequency, and dosage.<sup>1</sup> Clinical Pharmacology defines the compliance" it is how closely patients adhere to recommendations for at least 80% of the course of treatment"<sup>2</sup>. Patient-centered factors like patient's ethnicity, gender, age, marital status, and education, therapy-related factors, healthcare system factors can disturb the compliance the drug therapy. The leading cause of death worldwide is cardiovascular disease (CVD), accounting for 31% of yearly death rates attributed to social and economic causes as well as disease related factors, hyperlipidemia is thought to be the predominant risk factor.<sup>3</sup>

Since hyperlipidemia has no symptoms, many people do not think they need to take medication. Without a doubt, treating diseases with minimal symptoms, such as hypercholesterolemia, has been difficult for both patients and doctors due to non-compliance with treatment.<sup>4</sup> According to estimates, 50% of patients do not follow prescriptions closely.<sup>5,6</sup>

Low density lipoprotein cholesterol (LDL-C), according to the American College of Cardiology (ACC) and the American Heart Association (AHA), is lowered by 30% with mild statin medication and by 50% with greater statin therapy. LDL-C dropped by 3.8 mg/dL, when there was an increase in statin compliance of 25%. Cardiovascular problems reduced 10% overall when LDL-C is reduced by 10 mg/dL.<sup>7</sup>

According to a study, patients over 65 years old have three times the compliance of those under the age of 40,<sup>8</sup> and women have a 10% higher risk of non-compliance than men do. According to the National Health and Nutrition Examination Survey, 35% of men and 25% of women in the US have elevated triglycerides during the past twenty years or more. Triglyceride levels were 14% and 21% in black women and men, 35% and 40% in American men and women of Mexican heritage, and 25% & 37% in American white women and men, respectively.<sup>9</sup>

According to a large observational study by the Prospective Cardiovascular Munster (PROCAM), men are more likely than women to have hypertriglyceridemia (18.6% vs. 4.2%). Both the

Apo C II and lipoprotein genetic mutations have an equal impact on males and females.<sup>10</sup>

## METHODOLOGY

This cross-sectional study was conducted in Medicine & Cardiology Department at People Medical College Hospital Nawabshah (SBA). A total of 100 patients with hyperlipidemia (diagnosed by a fasting lipid profile) were enrolled through the OPD of Cardiology & Medicine using a convenient sampling technique. By using the inclusion criterion that patients must be 30 years of age or older, the patients were registered. The diagnosed cases/patients with mild to severe hyperlipidemia (cholesterol 160–200 mg/dl to 200–290 mg/dl) without comorbidities, patients with hyperlipidemia were enrolled.

**Data collection procedure:** Data of hyperlipidemia patients was gathered from the medicine and cardiology departments of P.M.C.H. after receiving approval from the ethical review committee and obtaining written consent. Proforma was filled as intended. Seven visits were required of the patients (Table 1). The first visit served as the baseline and was recorded on day 1, the second on day 15, the third on day 30, the fourth on day 45, the fifth on day 60, the sixth on day 75, and the seventh and final visit of each patient was recorded on day 90 of the study.

On each visit, patients were asked to return marked empty blister packs of pills, and the Morisky scale was used to assess compliance<sup>11</sup>. The Morisky Medication Adherence Scale—a self-reported questionnaire of medication adherence with three levels denoting strong adherence with a score of 8, medium adherence denoting with a score of 6 to 8, and low adherence denoting with 6—was used to evaluate statin adherence. The data was computed after the trial was over.

**Data Analysis:** Finally, SPSS, IBM version 21.0 was used to analyse the data and determine the relevance of the findings. The statin compliance related to gender was estimated, and the proper tests were used in the data analysis.

## RESULTS

There were 100 patients registered in total, and their average age was 49.45± 9.72 years. The age group most frequently affected

was 51–70 years old, or 56%, and 31–50 years old, or 44%. (Table 1). Males were more likely to be impacted than females, with a ratio of 54% to 46%, respectively (Fig. 1). A mean of 231.83± 15.9 mg/dl was the cholesterol level. In both genders, > 80% PDC response was reached when statin medication compliance was compared to gender; however, the results were not significant statistically (p value: 0.726) (Table 1 & 3).

Table 1: Gender Age and variables

Variables	Frequency
Age (years)	
Mean ±SD	49.45± 9.72
(Gender)	
Male: female	54: 46
Cholesterol in mg/dl	231.83± 15.9

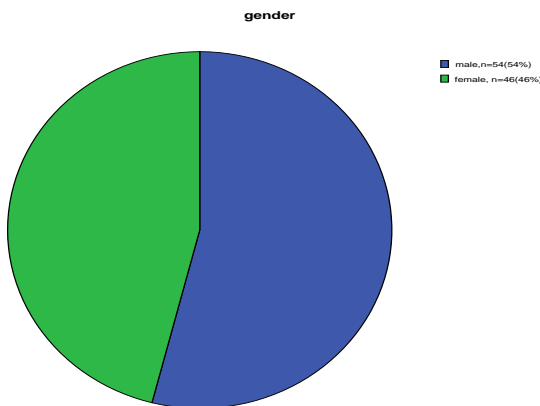


Figure 1: Graph showing the frequency of each gender.

Table 2: Gender, Age and Cholesterol Comparison

Variables	Cholesterol in mg/dl			P value
	201-220mg/dl	221-240mg/dl	241-260mg/dl	
Gender	12	32	10	0.344
Male	13	29	4	
Female				

Table 3: Statin Compliance according to PDC% in both Genders.

Variables	Statin compliance		P value
	PDC >80%	PDC <80%	
Gender	37	17	0.726
Male	33	13	
Female			

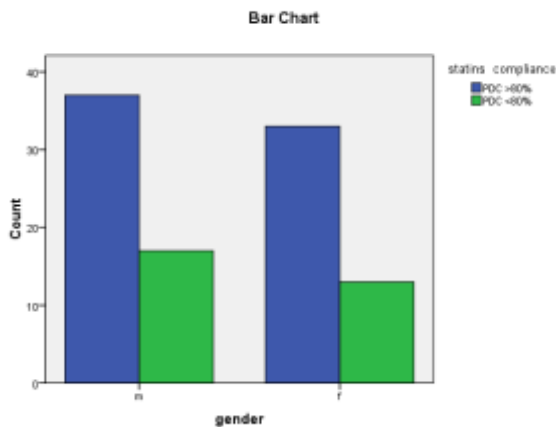


Figure 2: Comparison of stain compliance by gender presented graphically. P value 0.726

## DISCUSSION

Cardiovascular morbidity and mortality are primarily caused by hyperlipidemia.<sup>1-4, 12-13</sup>Statin therapy is employed as a preventive measure in both the prevention of primary and secondary cardiovascular issues, which always has an impact on a person's normal state of health. Inhibitors of hydroxyl methylglutaryl coenzyme reductase are currently the major treatment for statins. Statins are also utilised in the treatment of peripheral vascular disorders, heart failure, the CAD equivalent, and other cardiovascular conditions. However, the mortality rate in people with coronary heart disease is decreasing as a result of risk-reduction techniques made possible by statin use. Additionally, the mortality benefits from MI that were observed following statin medication decreased from 21% to 7%. Despite its value, non-compliance poses a serious chance that the person would experience an avoidable illness. It has been demonstrated that Chinese and Asians exhibit lower compliance.<sup>14</sup>

Based on race/ethnicity, gender, and cardiovascular results, there are significant differences. Although they have received little attention, long term rates of drug adherence and evidence-based medications use also seem to be lower among women and among racial subgroups.<sup>15</sup> Our goal was to assess how gender affected whether statin therapy was used for primary or secondary prevention.

In certain investigations, such as the Landmark trials research, the control of hyperlipidemia was assessed based on gender (i.e. 4S, WOSCOPS, CARE, and LIPID studies)<sup>16-17</sup> came to the conclusion that men had better control over dyslipidemia, with women making up less than 20% of the population.<sup>18,19</sup> Since women made up 44% of the population in this survey, it implies that gender base may have an impact. When statin medication compliance in our study was compared with gender, both genders experienced PDC responses of > 80%, however the results were not statistically significant (p = 0.726).

Similar results were found when cholesterol levels and gender were evaluated in our study, with both genders showing virtually similar incidence and a value that was statistically non-significant.

According to a study by Hunt et al., only men and women 37% in both groups reached the LDL-C treatment objective. The PDC was higher than 80% like our study, and the adherence rates were moderate (in males 73.1% and in women 72.0%).<sup>20</sup> However, our study's findings were slightly different from the PDC's. But a research by Karen M. Goldstein et al found that women are less likely to take statins consistently than males are.<sup>21</sup>

The study by Hero et al concluded that after 36 months, the odds ratio [(OR) 1.30, p 0.0001, showed that hyperlipidemic patients older than 53 years were more likely to adhere to lipid lowering therapy (MPR > 80%) than people under the age of 36. Women were less likely to cease using LLT and more compliant at 18 months (OR 1.05, p = 0.0005 and OR 0.95, p = 0.0004, respectively).<sup>22</sup> but not at 36 months. So these results shows there is some individual behaviors, resources, age also affecting the compliance of statin therapy. But in our study conducted on local population does not showed any statistically significant difference in compliance regarding the gender factor.

## CONCLUSION

Compliance of statin therapy remained high PDC > 80% in both genders having hyperlipidemia. However in comparison of both genders results were not statistically significant p value-0.726. That means male and female patients of hyperlipidemia in Pakistan are well adherent to statin drug therapy.

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