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ORIGINAL ARTICLE

Abnormal Liver Function Test and Statins

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ABSTRACT

Introduction: Statins or 3-hydroxy-3-methyl-glutaryl-coenzyme A (HMG-CoA) reductase inhibitors are one of the foremost commonly endorsed medications in cardiac patients. A bit like any other lesson of drugs, they have the potential to cause liver harm over time indeed with reasonable utilize. This drug induced liver harm (DILI) can be either coordinate (hepatocellular) or peculiar. As with multiple other hepatic pathologies, DILI may be asymptomatic or clinically quiet. Subsequently, it is judicious to carry out liver work tests (LFTs) from time to time. LFTs are an inexpensive, noninvasive, and fast first-line examination to monitor liver status. Be that as it may, the design of liver damage with statin utilize isn't particular and a relationship over time may not be clear.

Objectives: To assess the derangements in Liver function test with regard to statin utilization and decide if there is any correlation exists.

Method: Retrospective Observational study conducted in Punjab Institute of Cardiology, Lahore, from 31st July 2020 to 30 June 2021.

Data Collection Procedure: This study is conducted at Punjab Institute of cardiology, Lahore, a total of 100 patients admitted from 1st July 2020 to 30 June 2021 with ischemic heart diseases were considered for inclusion as this was retrospective observational cohort study. The patients already taken statin were included in this study. LFTs were noted before the start of statin in their records then during the use of statin at 3rd and 6th month with great care. The collected data was analyzed by using SPSS version 23.

Results: A total number of 100 patients were included in this study after inclusion exclusion criteria. The ratio male to female is 3:2.Patients using two types of statin i.e. Atorvastatin 20mg and Rosuvastatin 10mg were included. LFTs elevation was seen in the study.

Conclusion: The use of statins clinically proved insignificant elevation of LFTs and hence it is safe to prescribe.

Keywords: (HMG-CoA) reductase, Liver finction tests, Statin, LFTs

INTRODUCTION

Statins (moreover called HMG-CoA reductase inhibitors) block an enzyme called[1] HMG-CoA reductase (3-hydroxy-3-methylglutaryl coenzyme A reductase) that's included within the synthesis of mevalonate, a normally happening substance that's at that point utilized by the body to create sterols, including cholesterol.

This activity decreases your add up to cholesterol level, counting your low-density lipoprotein (LDL) or "bad" cholesterol level. It is moreover increments your level of high-density lipoprotein (HDL), which is considered "good" cholesterol. These impacts can diminish your chance of heart assault or stroke. The exceptionally to begin with statin, called lovastatin, was affirmed within the Joined together States in 1987. Since at that point, six other statins have been created and endorsed. These drugs all come in either a tablet or capsule that you just take by mouth[2].

Seven types of statins available in the market named atorvastatin, fluvastatin, lovastatin, pivastatin, pravastatin, rosuvastatin and simvastatin. Not all statins are made break even with. Certain statins are stronger, meaning they diminish your LDL and add up to cholesterol levels more than other statins. A few statins have been appeared to decrease the chance of heart attack and stroke in individuals who have never had these occasions. This utilize is called primary prevention[3].

With secondary prevention, the drugs are utilized to anticipate the repeat or heart assault or stroke. At the conclusion of the day, statins decrease the atherogenic lipoprotein burden and have been appeared to decrease the chance and incidence of nonfatal myocardial infarction, ischemic stroke, and all that cause cardiovascular mortality. In the setting of prevention, statins, particularly rosuvastatin, reduce intima thickness they require for revascularization treatment, hence improved survival rates. All these perspectives make statins perfect drugs for the treatment and avoidance of cardiovascular diseases. Statins have been an overpowering success since their presentation within the 1980s and went on to end up one of the top-selling solutions within the world. One such fact is that of irregular liver work tests (LFTs). This may well be due to the truth that like most drugs, statins are essentially metabolized within the liver. This could lead to direct hepatocellular damage, causing unsettled liver work tests[4].

Besides any medication has the potential to cause an peculiar liver damage named as 'drug-induced liver injury' or 'DILI' which will be hepatocellular, cholestatic, or blended design in nature.

Liver damage has rarely ever been reported but gentle rises of alanine aminotransferase (ALT) or aspartate aminotransferase (AST) have been recorded. The patients having liver diseases by using statins led to improve the enzymes level of AST and ALT[5].

MATERIAL AND METHODS

This study is conducted at Punjab Institute of cardiology, Lahore, a total of 100 patients admitted from 1st July 2020 to 30 June 2021 with ischemic heart diseases were considered for inclusion as this was retrospective observational cohort study. The patients already taken statin were included in this study. LFTs were noted before the start of statin in their records then during the use of statin at 3rd and 6th month with great care. Consecutive and non probability sampling technique was used with age of patients greater than 18 years of any gender. Patients with history of smoking, fatty liver disease, chronic liver disease, Alchoholic liver disease, hepatitis and malignancy were excluded from this study.The collected data was analyzed by using SPSS version 23. The mean and standard deviation was calculated for age, term of statin utilize, and LFTs. Frequency was considered for the sort of statin used, provisional diagnoses, and comorbids. A p-value of <0.05 was taken as significant[6].

RESULTS

A total number of 100 patients were included in this study after inclusion exclusion criteria. The ratio male to female is 3:2.Patients using two types of statin i.e. Atorvastatin 20mg and Rosuvastatin 10mg were included. LFTs elevation was seen in the study. The most common presentation in the study was Non-ST-elevation myocardial infarction and hypertension. Seventy-nine patient already taking rosuvastatin 10mg/day and 21 were using atorvastatin 20mg/day at induction. The mean for alanine transaminase (ALT), aspartate transaminase (AST), and gamma-glutamyl transpeptidase (GGT) were all marginally raised.

Table 1: General information regarding admission.

Sr. No.		N=100
1	Age(Mean)	45+10 years
2	Male	60(60%)
3	Female	40(40%)
4	Admission Pre requisite (Diagnosis)	
	ACS	4(4%)
	LWMI	10(10%)
	IWMI	16(16%)
	AWMI	30(30%)
	NSTEMI	40(40%)
5	Comorbids	
	DM	15(15%)
	HTN	60(60%)
	HTN & DM	20(20%)

NSTEMI=Non-ST-elevation Myocardial Infarction, AWMI=Anterior wall Myocardial Infarction, IWMI=Inferior Wall Myocardial Infarction, ACS=Acute Coronary Syndrome, HTN=Hypertension, DM=Diabetes Mellitus.

Table 2: Duration and types of statins used in the study.

Sr. No		N=100
1	Total duration of statin use(Mean)	15+5 months
2	Rosuvastatin 10mg	79(79%)
3	Atorvastatin 20mg	21(21%)

Table 3: Liver functions tests with respect to All Statins.

Sr. #	Markers	At Induction	3 Mth	6 Mth	Normal ranges	p-value
1	ALT(IU/L)	40+12	41+11	41+10	10-50	>0.05
2	AST(IU/L)	35+11	36+12	36+13	5-40	>0.05
3	GGT(IU/L)	37+13	37+10	38+12	0-40	>0.05
4	ALP(IU/L)	80+20	81+25	83+24	35-140	>0.05

Table 3: Liver functions tests with relation to specific statins.

Sr #	Markers	At Induction	3 months	6 months	Normal ranges	p-value
Atorvastatin 20mg/day						
1	ALT(IU/L)	42+12	40+11	44+10	10-50	>0.05
2	AST(IU/L)	37+11	37+12	39+13	5-40	>0.05
Rosuvastatin 10mg/day						
1	ALT(IU/L)	41+12	42+11	40+10	10-50	>0.05
2	AST(IU/L)	37+11	37+12	32+13	5-40	>0.05

ALT=Alanine transaminase, AST=Aspartate transaminase, GGT=Gamma-glutamyl transpeptidase, ALP=Alkaline phosphatase.

DISCUSSION

Borderline rises are nearly continuously generous. These require no encourage mediation, and patients can be securely endorsed drugs over long periods of time. The middle time period of statin utilize some time recently acceptance in our think about was 15 months. ALT levels were somewhat more elevated than AST levels in our study; this essentially compares to the truth that ALT could be a more particular marker of liver damage than AST for most patients.

All heights were found to be factually insignificant. As said already, these borderline heights do not justify encourage investigation or mediation and, thus, statins can be utilized without hesitation[7].

The built up the safety and adequacy of statin utilize in cardiovascular diseases with abnormal liver work tests. Numerous comes about from our study imitate those of the GREACE ad-hoc investigation. Improved cardiovascular results, no prove of clinically noteworthy liver damage, or decompensation over time and as it were mild rises of LFTs with statin utilize are some of them. Whereas the GREACE analysis worked on atorvastatin primarily, in our study, these results were seen with rosuvastatin as well. There were two major contrasts between our think about and the GREACE examination[8]. One, we did not induct patients with fatty liver illness in our study, though a great extent of

patients in the GREACE investigation had it. Furthermore, all of our patients were utilizing statin some time recently acceptance into the study and all patients had a few heights of LFTs, this was not the case with the GREACE analysis. These were due to varying study conventions and were statically and clinically insignificant[9].

There were cases where ALT and/or AST levels diminished over the follow-up period, but such occurrences were distant few and between. Within the tremendous majority of the patients, both ALT and AST were gently elevated indeed some time recently acceptance. These levels either remained unfaltering or increased mildly over the follow-up period. These rises did not have any clinical or statistical impact inevitably but the return of LFTs to ideal levels was not the standard. This can be the one instance where our consider contrasts extraordinarily from past data[10].

Our opinion is driven by a single perception that an awfully little rate of patients in our study did create direct rises of LFTs. These patients are prime candidates for the improvement of DILI. Such patients require standard testing and stoppage of the drug (in the event that recognized) ought to LFTs stay elevated chronically, as DILI can cause irreversible liver damage. There's no other strategy to distinguish these patients but to carry out normal LFTs.

So yes, there's a relationship between irregular LFTs and statin utilize. But more critically, in light of all the past information examined here and it is basic to keep in mind that these minor derangements don't carry any clinical significance.

CONCLUSION

The use of statins clinically proved insignificant elevation of LFTs and hence it is safe to prescribe. There is a relationship between disturbed LFTs and statin utilize. This relationship is dose dependent but is clinically and measurably insignificant.

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