CHANGE IN DERANGED SERUM CHOLESTEROL, SERUM HIGH DENSITY LIPOPROTEIN (HDL) AND PSORIASIS AREA SEVERITY INDEX (PASI) SCORE OF PSORIATIC PATIENTS WITH LOW DOSE ORAL ATORVASTATIN THERAPY

Fazal-Ur-Rehman Bangash[1], Abdur Rahim Khan[2], Gul Naz Begum[3], Nabila Sher Mohammad[3], Nayyer Uz Zaman[4], Arshad Parvez[1]

ABSTRACT

Background: Psoriasis, a debilitating proliferative chronic inflammatory skin disease with a global prevalence of 3.5 %, and deranged values of cholesterol and high density lipoprotein (HDL) in the blood, is a worldwide major public health problem. Oral Atorvastatin therapy might be beneficial in treating deranged values of cholesterol and high density lipoprotein in blood and psoriasis as well as it reduced both of them.

Objective: To determine the efficacy of low dose atorvastatin therapy (10 mg/day) in terms of improvement of serum cholesterol and serum HDL levels and PASI score in patients having psoriasis.

Methodology: This Study included 60 psoriatic patients who were randomly divided by lottery method into two equal groups after fulfilling inclusion/ exclusion criteria. Each participant's deranged serum cholesterol, serum HDL levels and Psoriasis Area and Severity Index scores were calculated and analyzed on 1st visit. Participants of intervention group were provided tablet Atorvastatin 10 mg as daily dose for three months and were allowed to take conventional treatment for psoriasis too while controls were allowed to take conventional treatment for psoriasis which they were already on. After three months on follow up visit of both groups their serum cholesterol, serum HDL levels and PASI scores were reassessed.

Results: There was a significant reduction in serum cholesterol and serum HDL derangement and PASI scores of participants of intervention group with Atorvastatin 10 mg/day oral therapy for three months as compared to control group. In intervention group, p-value for variables under study came out to be less than 0.05 whereas in control group p-value for these variables came out to be greater than 0.05 except for serum cholesterol but even then it was far more than for serum cholesterol of intervention group.

Conclusion: Atorvastatin in small dose i.e. 10 mg/day is effective in lowering serum cholesterol and serum HDL derangement and decreasing psoriasis severity.

Key Words: PASI score, Psoriasis, Serum Cholesterol, Serum High Density Lipoprotein.

INTRODUCTION

Psoriasis is a common chronic inflammatory, debilitating and immune mediated skin disorder.[1] Psoriasis vulgaris is as the commonest type of psoriasis accounting for almost 90% of all cases with symmetrically distributed dull red or pink salmon silvery scaly plaques well differentiated from normal surrounding skin. [1] It is considered as genetic, systemic and immunologic skin disorder.[2,3] 3.5 % is the global average prevalence for psoriasis.[4] Data is scarce regarding prevalence and incidence of psoriasis in Pakistan.[5] Reduction in the life expectancy of psoriatic patients is mostly considered due to a complication of psoriasis in the form of higher incidence of cardiovascular disorders.[6] Correlation between cardiovascular disease and psoriasis is today's emerging concern.[6] It is also evident that psoriasis has an association with cardiovascular risk factors like diabetes mellitus, hypertension, obesity, deranged serum cholesterol, serum HDL and smoking.[7]

Research work on metabolism of lipids especially in psoriasis started in the 1st decade of 20th century by quantitatively analyzing cholesterol in the serum of psoriatic patients.[8] Psoriasis is commonly recurrent and chronic inflammatory skin disease which has an association with abnormal metabolism of plasma lipids.[9] Since

[1]Department of Pathology, Khyber Girls Medical College, Peshawar.
[2]Department of Dermatology, Hayatabad Medical Complex, Peshawar.
[3]Department of Biochemistry, Khyber Girls Medical College, Peshawar.
[4]Department of Biochemistry, Gajju Khan Medical College, Swabi.

Address for correspondence:
Dr.Fazal-Ur-Rehman Bangash
Department of Pathology, Khyber Girls Medical College, Peshawar.
Cell #: 03339119474
E-mail. xray2002_3@yahoo.com

total cholesterol level is elevated and have interrelationship with psoriasis severity [10], starting of statin therapy must be considered and accordingly cardiovascular risk assessment. As statins were helpful in reducing psoriatic cutaneous plaque activity, cardiovascular treatment for prevention of atherosclerosis might also be helpful in reduction of psoriatic disease severity.[11] In last few years, inflammatory and immunomodulatory effects of statins have been identified which may be beneficial for psoriatic patients.[12]

The rationale was to conduct a randomized control study to know the effect of low dose Atorvastatin 10 mg alone, for a comparatively shorter time i.e. three months, on levels of serum cholesterol, serum HDL and clinical improvement in severity of psoriasis. In our study the dose of Atorvastatin was 10 mg to see whether the effect of small dose of Atorvastatin in psoriasis was as effective as with high dose.

METHODOLOGY

It was a randomized control study conducted during February 2018 to September 2018 at Dermatology department of Hayatabad Medical Complex Peshawar. Patients having psoriasis were enrolled from Dermatology unit Hayatabad Medical Complex Peshawar fulfilling inclusion criteria of the same age group, having psoriasis history more than one year and deranged serum cholesterol and serum HDL while exclusion criteria of smokining, obesity, pregnancy, NIDDM, HTN and patients on lipid lowering agents. Serum cholesterol and serum HDL estimation was done in Research laboratory of Khyber Girls Medical College Hayatabad Peshawar.

PASI Score was recorded on a structured proforma. 3 ml blood samples were taken from 12 hourly or more fasting individuals, by venipuncture from cubital vein and kept in ice packs until transferred to Research laboratory of Khyber Girls Medical College Hayatabad. Serum cholesterol and serum HDL was estimated by enzymatic colorimetric method on spectrophotometer (Merck Microlab 300 made in Japan). Those having normal range were excluded from the study. 60 eligible participants for this study were randomly equally divided into intervention and control groups by lottery method through choosing an envelope of their own choice. Participants of intervention group were provided tablet Atorvastatin 10 mg daily dose for 12 weeks. Both groups continued taking conventional psoriasis treatment as they were already on. After 12 weeks, on follow up visit of both groups, PASI score, serum cholesterol and serum HDL was reassessed.

Raw data was collected and organized in the form of tables. Means of PASI score, serum cholesterol and serum HDL of intervention group before and after intervention as well as of control group on 1st and follow up visits was analyzed by paired samples t-test and p-value was calculated by using SPSS version 21. p-value ≤ 0.05 was statistically considered significant.

Table 1 shows that p-value for pairs of PASI score, serum cholesterol and serum HDL of intervention group in the present study was 0.001 which was less than 0.05. It means that in intervention group of this study there was a statistical significant variation between the mean results of 1st visit before Atorvastatin 10 mg/day therapy and follow up visit after Atorvastatin 10 mg/day therapy.

Table 2 shows p-value for pairs of PASI score, serum cholesterol and serum HDL of control group in this study was greater than 0.05 except for serum cholesterol i.e. 0.032 but even then it was far more than for intervention group i.e. 0.001 which means that there was no statistically significant variation between the mean results of 1st visit and follow up visit for control group without Atorvastatin therapy of present study.

DISCUSSION

Correlation between psoriasis and cardiovascular diseases is an emerging concern of present time with a risk factor like deranged levels of serum cholesterol and serum HDL.[6,7] In the present study on follow up visit of psoriasis patients in intervention group, at the end of third month of Atorvastatin (10 mg/ day) therapy, significant improvement was seen in the severity of psoriasis and the mean percent serum total cholesterol was reduced whereas serum high density lipoprotein was increased in intervention group during follow up visit. Similar results were also shown in a study by Asad F and her co researchers from Pakistan in 2017 with 40 mg/ day.[13] The reasons for similar results might be same nationality, similar study design and sample size with similar group of antihyperlipidemic drug. A study, by Turkish researcher Piskin S and his colleagues in 2003, reported normal level of serum HDL which is a contrasting result to our study.[14] The reasons for difference might be different nationalities and different sample size with study design.

An Indian study by Nakhwa YC and his colleagues in 2014 presented significant elevation of serum cholesterol and serum high density lipoprotein in cases and controls.[15] In contrast to our study, Faghihi T and his co researchers from Iran in 2011, gave oral Atorvastatin at a dose 40 mg/ day and failed to prove association with therapeutic benefit when administered to psoriasis patients grouped separately in Atorvastatin vs placebo group with PASI score below 12 prior to Atorvastatin therapy.[16] The reasons might be different countries with different geographical populations with different genetic makeup.

So I looked for any clinical and biochemical improvement in psoriasis patients with deranged serum cholesterol and serum HDL levels in intervention and control groups by randomized control study. I did this research to know if low dose i.e. a tablet of 10 mg daily

Table 1: Paired samples t-test of PASI score, Serum Cholesterol and Serum HDL of intervention group.

Pairs	Variables	Mean	Std. Deviation	T	df	p-value
Pair 1	PASI score on 1st visit/ follow up visit	0.80000	0.61026	7.180	29	0.000
Pair 2	Serum Cholesterol on 1st visit/ follow up visit	57.033	20.744	15.059	29	0.000
Pair 3	Baseline Serum HDL/ Follow up	-15.167	5.363	-15.489	29	0.000

Table 2: Paired samples t-test of PASI score, Serum Cholesterol and Serum HDL of control group.

Pairs	Variables	Mean	Std.Deviation	T	Df	p value
Pair 1	PASI score on 1st visit/ F.Up visit	-0.06897	0.45756	-0.812	28	0.424
Pair 2	Serum Cholesterol on 1st visit/ F.Up visit	-3.793	9.053	-2.256	28	0.032
Pair 3	Serum HDL on 1st visit/ F.Up visit	0.241	1.902	0.683	28	0.500

Atorvastatin for three months has the effect on deranged serum cholesterol, serum HDL and disease severity of psoriasis. p-value for all pairs of PASI score, serum cholesterol and serum HDL of intervention group in this study was 0.001 which was less than 0.05 as compared to control group. It means that in intervention group of this study, there was a statistical significant variation between the mean results of 1st visit before Atorvastatin 10 mg/day therapy and follow up visit after Atorvastatin 10 mg/day therapy.

CONCLUSION

Decrease in PASI score along with decrease in serum cholesterol and increase in serum HDL of intervention group showed significant improvement with Atorvastatin 10 mg/ day oral therapy for three months.

REFERENCES

1. Griffiths CE, Barker JN. Pathogenesis and clinical features of psoriasis. Lancet. 2007;370(9583):263–71.
2. Barker JN. Genetic aspects of psoriasis. Clin Exp Dermatol. 2001;26:323–5.
3. Schlaak JF, Buslau M, Jochum W. T cells involved in psoriasis vulgaris belong to the Th1subset. J Invest Dermatol. 1994;102:145–9.
4. Parisi R, Symmons DPM, Griffiths CEM, Ashcroft DM. Global Epidemiology of Psoriasis. A Systematic Review of Incidence and Prevalence. J Invest Dermatol. 2013;133(2):377–85.
5. Ejaz A, Suhail M, Iftikhar A. Psoriasis in pakistani population. Associations, comorbidities and hematological profile. JPAD. 2013;23(1):42–6.
6. Gelfand JM, Neimann AL, Shin DB, Wang X, Margolis DJ, Troxel AB. Risk of myocardial infarction in patients with psoriasis. JAMA 2006;296:1735–41.
7. Egeberg A. Psoriasis and comorbidities. Epidemiological studies. Dan Med J. 2016;63(2):1–11.
8. Chibowska M. Role of serum lipids in psoriasis. Przegl Dermatol. 1970;57(2):255–60.
9. Rocha-Pereira P, Santos-Silva A, Rebelo I, Figueiredo A, Quintanilha A, Teixeira F. Dislipidemia and oxidative stress in mild and in severe psoriasis as a risk for cardiovascular disease. Clin Chim Acta. 2001;303:33-9.
10. Vahlquist C, Michaelsson G,Vessby B. Serum lipoproteins in middle aged men with psoriasis. Acta Derm Venereol (Stockh). 1987;67:12–5.
11. Shirinsky IV, Shirinsky VS. Efficacy of simvastatin in plaque psoriasis. A pilot study. J Am Acad Dermatol. 2007;57:529-531.
12. Aslam S, Khurshid K, Asad F. Efficacy and safety of simvastatin in chronic plaque psoriasis. JPAD. 2013;23(3):310–4.
13. Asad F, Khan M, Rizvi F. Atorvastatin as an adjuvant with betamethasone valerate reduces disease severity and cardiovascular risks in Psoriasis. JPMS. 2017;33(6):1507-11.
14. Piskin S, Gurkok F, Ekuklu G, Senol M. Serum lipid levels in psoriasis. Yonsei Med J. 2003;44(1):24–6.
15. Nakhwa YC, Rashmi R, Basavaraj KH. Dyslipidemia in Psoriasis. A Case Controlled Study. Int Sch Res Not. 2014;1–5.
16. Faghihi T, Radfar M, Mehrabian Z, Ehsani AH, Rezaei Hemami M. Atorvastatin for the treatment of plaque type psoriasis. Pharmacotherapy. 2011;31:1045–50.