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The Incidence of Lipoprotein Disorder in Patients with Psoriasis Attending in a Tertiary Care Hospital of Bangladesh

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Abstract- *Objective:* In this study our main goal is to evaluate the incidence of lipoprotein disorder in patients with psoriasis attending tertiary care hospital in Bangladesh.

Method: This case control study was carried out in the Department of Dermatology & Venereology, Chittagong Medical College Hospital (CMCH), Chittagong from June 15, 2013 to May 14, 2014. In this study; 60 patients with Psoriasis (group-A) and 60 patient with skin disease other than Psoriasis (group-B) were included according to availability within the study period.

Results: During the study, it was found that; most of the patients were male among the psoriasis patients. Mean ±SD of weight was found 61.87±7.84 kg and height was found 1.62±0.05m among the psoriatic patients. There was a significant differences in Systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) between group A (Psoriasis) and group B (Skin diseases other then Psoriasis).

Keywords: *psoriasis, dyslipidemia, diabetes, hypertension.*

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Conclusion: Our study indicates that the Psoriatic patients with Diabetes and Hypertension have increased risk of abnormal serum lipoprotein levels which may aggravate the Microvascular and Macrovascular end points. Further study is required to evaluate whether this lipoprotein abnormalities among Psoriatic patients having Diabetes Mellitus and Hypertension is due to other chronic co-morbid diseases or psoriasis plays the predominant role in the genesis of Dyslipidemia?

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I. Introduction

Psoriasis is a chronic inflammatory disease related to many diseases, especially cardiovascular disease. Among these diseases, atherosclerosis plays the most important role.[1] Atherosclerosis is caused by inflammation and an imbalance of the lipid metabolism. Psoriasis and atherosclerosis not only share the same cytokines involved in the immunological mechanism, such as interleukin-17 (IL-17), but also have common angiogenic factors and oxidative pathways.[2] In addition, both of them have similar lipid profiles, including decreased high-density lipoprotein (HDL) levels and/or increased low-density lipoprotein (LDL) levels.[3] In the pathological process of atherosclerosis, the accumulation of cholesterol triggers the production of pro-inflammatory cytokines, such as Tumor Necrosis Factor Alpha (TNFα), and also leads to the aggregation of monocytes and differentiation into foam cells. TNFα eventually induces an inflammatory cascade in blood vessels. [4]

In chronic inflammation TNFα may also influence the lipid profile, such as LDL-C levels, via a decreased concentration of a Apolipoproteins. Moreover, TNFα lowers the quality of lipoprotein by inducing the production of LDL and Oxidized LDL (oxLDL) and reducing the level of HDL-C at the same time. Oxidized LDL (oxLDL) not only exacerbates the inflammation but also promotes cholesterol accumulation in lysosomes, which eventually leads to cell death. On the other hand, HDL has a reverse cholesterol transport (RCT) function, anti-oxidative capacity, and anti-inflammatory properties by regulating dendritic cells' (DCs) differentiation, and reducing T cell activation and IL-12 production. However, these properties are reduced during chronic inflammation, such as psoriasis.[5]

In this study our main goal is to evaluate the incidence of lipoprotein disorder in psoriasis patients attending tertiary care hospital in Bangladesh.

II. Objective

To assess the incidence of lipoprotein disorder in psoriasis patients attending tertiary care hospital in Bangladesh.

III. Methodology

a) *Type of Study*
This study is a case control study.

b) *Place of study*
This study was carried out in Department of Dermatology & Venereology, Chittagong Medical College Hospital (CMCH), Chittagong from June 15, 2011 to May 14, 2012.

c) *Study Population*
Patient presented with psoriasis and presented with skin problem other than psoriasis.

d) *Sampling Technique*
Purposive / Judgment sampling.

e) *Sample Size*
Assuming the prevalence of Diabetes Mellitus and Hypertension among the Psoriasis patients is 35% and acceptable error is 10% of it (prevalence). we get required sample size:- $n=Z^2x\ p\ x\ q/e^2$. z=Standard normal deviation 1.96. p=Prevalence (Assumed) of the disease = 0.35.q=1-P=0.65. e= Acceptable error = 10% of p=0.035. So $n=(1.96)\ x\ 0.35\ x\ 0.65/(0.035)^2$ = 713.44 According to above formula, sample size was obtained but due to time limitation, in the present study 60 patients with Psoriasis and 60 patient with skin disease other than Psoriasis were included according to availability within study period.

f) *Selection criteria*

i. *Inclusion criteria*

- For case - Diagnosed case of Psoriasis, - Patients of both sexes Age group 18-65 years.
- For control - Age matched Patients without Psoriasis.

ii. *Exclusion criteria*
1) Pregnancy -2) Secondary causes of Diabetes Mellitus such as Cushing Syndrome, Acromegaly, Thyrotoxicosis, Pancreatitis, Ca-Pancreas 3) Drugs like Corticosteroid, Thiazide diuretics etc. 4) Secondary Causes of Hypertension such as Cushing Syndrome, Thyroid disorders, Acromegaly, Chronic Kidney Disease (CKD) Drugs: Corticosteroid, OCP 5) Patient unwilling to give consent. 6) Severely ill patients eg, patients with renal failure, myocardial infarction shock.

g) *Study Procedure*
Patients attending in the Dermatology Department were diagnosed case or psoriasis was included in the study. 60 patients with age matched control who were attending in the same Department with skin problem were also selected. These patients were selected after excluding the exclusion criteria, Psoriasis was diagnosed clinically attending in the CMCH. Secondary causes of Diabetes Mellitus and Hypertension were also excluded clinically. Selected patients were informed about the aims, objectives, significance and detail procedure of the study before examination. An informed written consent was taken from all the patients who was selected for the study and encouraged for voluntary participation and allowed freedom to withdraw from the study whenever they liked even after participation. All eligible subjects will be provided a structured questionnaire with direct supervision by the researcher herself to obtain socio-demographic and health related Then clinical examination was done. Blood pressure was recorded by a standard Sphygmomanometer in sitting position aller 30 minutes rest. At least two records of blood pressure of the patient were taken on two occasions. Then average blood pressure was noted. Patients were asked to come in fasting condition for at least 8 to 12 hours. Fasting blood sample was taken for fasting blood sugar and fasting lipid profile. Then patients were given 75gm glucose mixed in 300ml of plain water. After two hours second blood sample was also collected for post prandial blood sugar. Blood sample was collected by same laboratory technologist and analysis was done in the Clinical Pathology Department of CMCH.

h) *Data Collection Method*
All relevant information for each individual study subject was recorded on pre-tested data sheet. The data sheet was used for collection of information. Data was collected by the researcher.

i) *Data Processing Plan*
Data was processed and analyzed using computer software SPSS (Statistical Packages for Social Sciences Version-19). The test statistics was used for analysis of data are student's t test (for comparison of data presented in quantitative scale like blood glucose level), Chi-square test (for comparison of data presented in categorical scale like presence of DM and HTN in two groups). For any analytical test the level of significance is 0.05 and P-value <0.05 was considered significant.

IV. Results

Table-1: Distribution of the patients according to age group

		N	Mean	±SD	Median	Range	Significance
Age (years)	Group A	60	47.78	9.81	48.00	27-65	P=0.159^{NS}
	Group B	60	44.97	11.86	47.00	26-65	

Table 1:- shows that the mean age of patient in group A is 47.78±9.81 and in group B is 44.97±11.86 which is almost similar in both the groups"

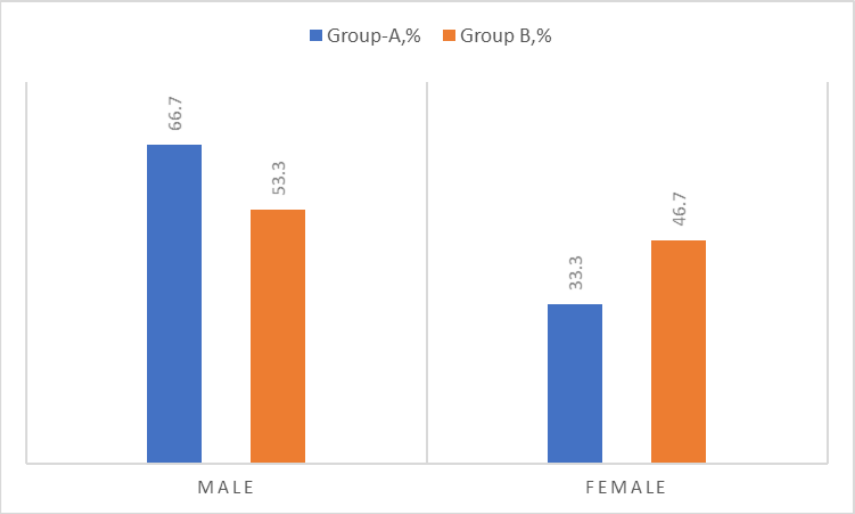

Figure-1: Gender distribution of the study

In figure-1 shows gender distribution of the study subjects where most of the patients were male in both groups. The following figure is given below in detail:

Table 2: Distribution of study groups (n=120)

Study Groups	Frequency	Percentage
GroupA (With Psoriasis)	60	50%
Group B (without Psoriasis)	60	50%
Total	120	100%

Table 2: among the total study subjects half of the patients included with diagnosed case of Psoriasis and the other half were with skin diseases other then Psoriasis.

Table-3: Socio Demographic status of patients.

Variables		Study group				X^2 Test of significance
		Group A, %		Group B, %		
		Number	% percent	Number	% percent	
Sex	Male	40	66.7	72	53.3	P= 0.136^{NS}
	Female	20	33.3	48	46.7	
Age group	≤30 years	6	10.0	20	23.3	P=0.121^{NS}
	31-40 years	8	13.3	21	21.7	
	41-50 years	24	40.0	38	23.3	
	51-60 years	18	30.0	33	25.0	
	>60 years	4	6.7	8	6.7	

In table-3 shows socio demographic status of patients. Among the study subject, two third was male. There was no significant difference in sex between group A and group B. In group A most of the patients belong to 4th decade and in group B was equal distribution of age group between 30-60 years. The following table is given below in detail

Table-4: Distribution of socioeconomic status among the study group A

Socio- economic status	Frequency	Percentage
Lower class	21	35
Lower Middle class	20	33
Upper middle class	16	26.7
Upper class	3	5

In table-4 shows distribution of socioeconomic status among the study group A. Among the psoriasis patients, most of them were from lower to upper middle-class family.

Table-5: Anthropometric findings of the patients with psoriasis

	N	Mean	±SD	Medium	Range
Weight (kg)	60	61.87	7.84	60.00	45-92
Height (m)	60	1.62	0.05	1.63	1.52-1.72
BMI (kg/M^2)	60	23.55	2.53	23.44	18.37-30.04

In table-5 shows anthropometric findings of the patients with psoriasis. Among the psoriasis patients mean ±SD of weight was found 61.87±7.84 kg and height was found 1.62±0.05m.

Table-6: Distribution of study groups according to blood pressure

Blood pressure		N	Mean	±SD	Medium	Range	Sign.
Systolic (mmHg)	Group A	60	130.08	18.42	130.00	100-210	P=0.002 highly significant
	Group B	60	120.50	13.74	120.00	100-140	
Diastolic (mmHg)	Group A	60	82.67	7.04	80.00	75-100	P=0.007 highly significant
	Group B	60	78.50	9.31	80.00	60-100	

In table-6 shows distribution of study groups according to blood pressure. There was a significant difference in systolic blood pressure and diastolic blood pressure between group A and group B.

Table-7: Distribution of study groups according to blood glucose level

Blood pressure		N	Mean	±SD	Medium	Range	Sign.
Fasting blood sugar	Group A	60	102.53	27.67	95.00	70-190	P=0.002 highly significant
	Group B	60	92.00	15.37	89.50	68-138	
Diastolic (mmHg)	Group A	60	82.67	49.98	130.00	90-360	P=0.007 highly significant
	Group B	60	78.50	27.27	124.50	85-198	

Table-7 shows distribution of study groups according to blood glucose level. There was significant difference in fasting blood sugar and post prandial blood sugar between group A and group B.

Table-8: Distribution of study groups according to lipid profile

Lipid profiles		N	Mean	±SD	Medium	Range	Sign.
Serum total cholesterol (mg/dl)	Group A	60	182.58	40.64	188.50	101-299	P=0.034 significant
	Group B	60	168.52	30.27	170.00	80-200	
Serum HDL (mg/dl)	Group A	60	37.97	6.68	37.50	20-62	P=0.032 significant
	Group B	60	35.73	4.38	36.00	30-42	
Serum LDL (mg/dl)		N	Mean	±SD	Medium	Range	Sign.
	Group A	60	120.47	29.63	125.00	65-185	P=0.022 significant
	Group B	60	109.52	21.15	110.00	68-144	
		N	Mean	±SD	Medium	Range	Sign.
Serum TG (mg/dl)	Group A	60	160.70	40.28	160.00	80-240	P=0.046 significant
	Group B	60	146.43	37.14	140.50	75-210	

Table-8 shows distribution of study groups according to lipid profile. There was significant difference in serum Total Cholesterol, HDL, LDL and TG between group A and B.

V. Discussion

Among the study subjects 60 (50% of the study Subjects) out of 120 patients were with Psoriasis and 60 (50% of the study subjects) out of 120 were without Psoriasis. The patients with Psoriasis were in the age group of 41-50 years. Among gender distribution 72(60% of the study subjects) were male. Group A and group B were statistically insignificant (p0.0).

In our study most of the Psoriasis patients were male (72%). The mean age of the Psoriatic patients are 44 years, which is supported by one other study.[6]In our country female are less conscious about their health. They have to do many households work. Economically they depend on males. For health related problems, they go to local village doctors for treatment. So, their attendance in tertiary level hospital like CMCH may be less than male.

In one large population-based study from the UK in which over 130,000 patients with psoriasis were included, showed higher incidences of Diabetes and Hypertension. Another study used the General Practice Research Database and found higher rates of Diabetes Mellitus, Hypertension, Hyperlipidemia, obesity and smoking in patients with psoriasis than in the controls subjects.[7-8] In one case control study conducted in USA in 2008 with data taken from the study of 1127 patients with Psoriasis and matched cohort of non-Psoriatic patients, Psoriatic patients were significantly more likely to develop Cardiovascular Co-Morbidities including Diabetes Hypertension, Hypercholesterolemia, compared with non-psoriasis patients.[9] In a hospital based case control study conducted in Italy, Metabolic Syndrome like Hyperglycemia, Hyperlipidemia, Hypertension was found significantly more common in Psoriatic patients than in controls (30.1% vs 20.6%, Odds ratio 1.65).[10] Another case control study conducted in Korea investigators also found a higher prevalence of metabolic syndromes (17.8%), Cardiovascular disease (4.6%), Hypertension (32.5%) and Hyperlipidemia (22.3%) in patients with Psoriasis, as compared with that of the controls.[11]

Regarding diastolic blood pressure mean±SD was found 82.67±7.04 mmHg in group A and it was 78.30±9.31 mmHg in group B. It was also found significant ($p<0.05$). Mean±SD of fasting biood sugar was found 102.53±27.67 mg/dl and post prandial blood sugar was found 144.75 ± 49.98 mg/dl among the group A patients whereas it was 92±15.37 mg/dl and 121±41.41 mg/dl in group B. Both the distribution is statistically significant ($p<0.05$). Among the study subjects DM was found in 26 patients (43.3) in group A and 10 patients (16.7%) in group B.[{OR(CI)}= 3.824 (1.635-R 8.942)]. p:0.051. HIN found 23(38.3%) in group A and 8(13.3%) in group B [{OR(CI)}= 4.041 (1.629-10020)]. $p<0.05$).

In the present study mean + SD of serum total cholesterol is 182.58±40.64 mg/dl, serum HDL is 37.97±6.68 mg/dl, serum LDL is 120.47±29.63 mg/dl and serum triglyceride is 160.70 40.28 mg/dl in group A and those are 168.52±30.27 mg/dl, 35.75±4.38 mg/dl, 109.52±21.15 mg/dl, 146.43±37.14 mg/dl respectively among group B patients. Distribution is statistically significant between both groups ($p<0.05$) which supports previous reports of an association between Psoriasis and Hyperlipidaemia. In a recent study among 1.3 million German health care recipients found that metabolic syndrome was 2.9 folds more frequent among Psoriasis patients and the most common diagnosis were Hypertension (35.6% in Ps Vs 20.6% in control) and Hyperlipidemia (29.9% Vs 17.1%).[12] Our study is nearly consistent with this study.

VI. Conclusion

1. Our study indicates that the Psoriatic patients with Diabetes and Hypertension have increased risk of abnormal serum lipoprotein levels which may aggravate the Microvascular and Macrovascular end points in patients with high risk groups.
2. Further study is required to evaluate whether this lipoprotein abnormalities among the patients with Psoriasis having Diabetes Mellitus and Hypertension is due to other chronic co-morbid diseases or psoriasis plays the predominant role in the genesis of Dyslipidemia?
3. Exploration of the relationship between Hyperlipidemia and Psoriasis may unveil the discovery of another novel treatment option for psoriasis with most promising outcome.

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