Original Article

Serum Lipid Profile in Vitiligo Patients: A Case Control Study

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Abstract

Background: *Vitiligo is a common dermatological problem which results from the loss of melanocytes from the epidermis and clinically manifest as well-demarcated white patches on the body. The prevalence of vitiligo is more than 8% worldwide. It causes cosmetic disfigurement and psychological problem, which has an impact on person's social & professional life. It also causes sun burn and skin cancer. Exact etiology of vitiligo is unknown but several hypothesis is associated in pathogenesis of vitiligo. High level of serum lipid profile may be associated with vitiligo.*

Objective: *The present study was carried out to assess serum lipid profile status in patients with vitiligo.*

Methods: *For this study, 50 subjects with vitiligo aged 20-50 years were considered as the study group (Group B) and 50 age matched healthy subjects were considered as control group (Group A) for comparison. Serum lipid profile was measured & compared in both group.*

Results: *In this study, serum total cholesterol, serum triacylglycerol and serum low density lipoprotein cholesterol were significantly ($p< 0.05$) higher in vitiligo patients as compared to healthy controls. Serum high density lipoprotein cholesterol was lower in vitiligo patients than healthy controls but it was not statistically significant.*

Conclusion: *From the study results, it was concluded that higher level of serum lipid profile was associated with vitiligo. The clinician may use lipid lowering agent such as simvastatin to treat this condition.*

Key words: *Vitiligo, Serum lipid profile.*

Introduction

Vitiligo is an acquired, idiopathic disorder characterized by depigmented patches in skin due to destruction of melanocytes. People of all ages and both sexes are affected equally. Patients lose their skin color usually in a patchy and progressive manner.[1] Clinically the activity of vitiligo is of two types, progressive and stable. In progressive disease there is enlargement of already present lesion and or the appearance of new lesion within two months and in stable vitiligo there is no change in the lesion within two months.[2] The prevalence of vitiligo is around 1% in the United States & Europe. It ranges from < 0.1% to > 8% worldwide.[3] In India, the prevalence ranges from 0.09% to 8%. In China, Nepal & Srilanka the prevalence of vitiligo are 0.09%, 0.9% & 1.2 % respectively.[4] Although vitiligo can affect any part of the body but the common sites are the exposed areas (face, neck, eyelids, nostrils, finger tips & toes), body folds (armpits, groin), nipple, lips and genitalia. It starts as multiple pigmented mole that develops a peripheral pigmented zone then gradually become fade & disappear in time. The white patches gradually enlarge over weeks to months. Vitiligo extends rapidly for a few months then stabilizes.[5] People with vitiligo may be at increased risk of developing social & psychological stress. The main impact of vitiligo is the psychological effect. Vitiligo patients have lower self-esteem, higher levels of perceived stigma and disability, anger, poorer Quality Of Life (QOL) overall and negative impact on sexual relationships.[6] Beside this patients may develop skin cancer & sun burn.[7] The exact cause of vitiligo is unknown but the most probable mechanisms are free radicals induced & immune mediated damage of melanocytes.[8] Higher level of serum lipid profile may be associated with vitiligo patients. Serum lipid profile includes serum total cholesterol (120-200 mg/dl), serum triacylglycerol (<150 mg/dl), serum low density lipoprotein cholesterol (<130 mg/dl) and serum high density lipoprotein cholesterol (>40 mg/dl).[9] Free radicals like superoxide anion (O_2-), hydroxyl radical (OH-) cause lipid peroxidation & produce lipid peroxides & lipoxides. These oxidizes yield malondialdehyde that causes destruction of melanocytes.[10]

Methods

The present study was a case control study and conducted in the Department of Physiology, Dhaka Medical College, Dhaka from July 2015 to March, 2016. A total of 100 subjects were selected with age ranging from 20 to 50 years. Among them, 50 subjects with vitiligo were considered as the study group (Group B) and 50 age matched healthy subjects were considered as control group (Group A) for comparison. The subjects were selected from outpatient department of Dermatology & Venereology, BSMMU, Dhaka & from personal contact from different areas of Dhaka city. Subjects with hypertension, diabetes mellitus, renal failure, hypothyroidism, pregnancy, vitamin B12 and folic acid supplementation were excluded from the study. After selection, the aim and benefit of the study was explained to each patient. An informed written consent was taken from all the participants.

Study protocol was approved by Institutional Ethics Committee of Dhaka Medical College. A detail medical and family history of all subjects were recorded in a preformed questionnaire. Anthropometric measurement of the subjects was done and blood pressure was measured. With all aseptic precautions 5 ml blood from each study subject was collected after an overnight fast (at least 12 hours) to measure serum lipid profile. This parameter was estimated in the Department of Biochemistry, BSMMU, Dhaka. Data were analyzed by Student's 't' test and Pearson's correlation coefficient (r) test using SPSS for windows version 22.0.

Results

The general characteristics of study subjects and control group are presented in Table I. Both the groups were matched for age and BMI. Serum total cholesterol, serum triacylglyerol and serum low density lipoprotein cholesterol level was significantly higher in group B ($p < 0.05$) in comparison to those of group A (Table II). Again, serum high density lipoprotein cholesterol level was lower in group B in comparison to those of group A (Table II) but it was not statistically significant ($p= 0.142$).

Table I : General characteristics of the subjects in both groups (n=100)

Parameters	Group		p value
	Group-A Healthy subjects (n =50)	Group-B Vitiligo patients (n =50)	(A vs B)
Age	35.00 ± 8.34 (20-50)	33.08 ± 6.53 (20 - 50)	0.203^{ns}
Sex			
Male	25 (50.0)	25 (50.0)	
Female	25 (50.0)	25 (50.0)	
Height (m)	1.62 ± 0.07 (1.52 – 1.73)	1.62 ± 0.06 (1.55 – 1.73)	
Weight (kg)	61.66 ± 6.09 (50 - 70)	60.52 ± 6.36 (52 - 70)	
BMI (kg/m^2)	23.3 ± 1.5 (20.7 – 27.4)	22.8 ± 1.0 (21.0 – 25.8)	0.095^{ns}
Systolic BP (mmHg)	117.80 ± 12.46 (100 - 180)	114.1 ± 7.6 (100 - 125)	
Diastolic BP (mmHg)	75.7 ± 7.0 (60 - 85)	75.8 ± 7.9 (60 - 85)	

Results are expressed as mean ± SD. Figure in parentheses indicate range. Unpaired Student's't' test was performed to compare between groups. The test of significance was calculated & p value < 0.05 was accepted as level of significance. n = number of subjects

Table II: Study parameter of the subjects in both groups (n=100)

Parameter	Group		p value
	Group-A Healthy subjects (n =50)	Group-B Vitiligo patients (n =50)	(A vs B)
Serum total cholesterol (mg/dl)	150.00±13.30	210.02±19.11	<0.005
Serum TAG (mg/dl)	115.74±48.70	180.00±57.23	<0.001
Serum LDL-C (mg/dl)	105.84±14.40	138.62±11.36	<0.001
Serum HDL-C (mg/dl)	50.92±5.27	48.74±7.4	0.142

Discussion

This case control, analytical study was conducted to assess the serum lipid profile status in vitiligo. A total of 100 subjects were included in the study based on predefined enrollment criteria. They were grouped into cases (vitiligo patients) and controls (healthy subjects). In this study male and female subjects were equal in number both in case and control group.The results of this study showed significantly higher (p <0.005) serum total cholesterol level in vitiligo patients (210.02±19.11 mg/dl) than control (150.00±13.30 mg/dl). Again, serum triacylglycerol is significantly higher (p< 0.001) in vitiligo patients (180.00±57.23mg/dl) than control group (115.74±48.70 mg/dl). Similar observations were reported by other investigators of different countries. In an Indian study the researchers showed that serum TAG level was significantly (p < 0.01) higher in vitilgo patients than healthy controls where the mean serum TAG was 174.21±55 mg/dl in cases and 138±26 mg/dl in controls.[11] The present study showed that serum LDL-C is significantly higher (p<0.001) in vitiligo patients (138.62±11.36 mg/dl) than healthy controls

(105.84±14.40 mg/dl). This study is supported by another study.[12] Again, this study revealed serum HDL-C is higher in control group (50.92±5.27 mg/dl) than vitiligo patients (48.74±7.4 mg/dl) but it was not statistically significant which is similar to another study.[13]

Several studies conducted by the researchers showed that clinical use of lipid lowering agent like simvastatin lowers the lesion of non segmental vitiligo.[14] Simvastatin is being evaluated for vitiligo management because of its multimodal action, easy availability and low cost.

The proposed multimodal actions range from anti-inflammatory, antioxidant to immunomodulatory properties which may be of therapeutic benefit in vitiligo patients.[15,16] So, as an option, lipid lowering agent may play a vital role in treatment of vitiligo.

Conclusion

From the study results, it was concluded that higher level of serum lipid profile was associated with vitiligo.The clinician may use lipid lowering agent such a simvastatin to treat this condition.

Limitations: The limitations of this study were small sample size & short time duration and different markers of oxidative stress such as serum malondialdehyde, superoxide dismutase & for autoimmunity melanocyte specific T cell could not be measured due to financial constrains.

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