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Original Research Article

Association of metabolic syndrome in patients of vitiligo

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ABSTRACT

Background: The metabolic syndrome is the term used to describe a constellations of metabolic derangements that includes insulin resistance, hypertension, Dyslipidemia, central or visceral obesity, type 2 DM & accelerated cardiovascular disease. An oxidative imbalance is responsible for the development of both metabolic syndrome & vitiligo.
Aim: In the present study we have evaluated the association of metabolic syndrome with Vitiligo.
Materials and Methods: In this observational cross-sectional study we selected 40 subjects attending skin OPD with age matched 40 controls and assessed the waist circumference, blood pressure, serum triglyceride level, cholesterol and high-density cholesterol along with Fasting blood glucose level at tertiary care Hospital. A detailed history including age, gender, diabetes mellitus, hypertension, smoking and onset of vitiligo was taken. The MetS criteria were defined by National Cholesterol Education Program Adult Treatment Panel III 2005 (ATP III) guidelines.
Results: We identified metabolic syndrome in 15 subjects with vitiligo and 6 subjects without vitiligo. The P value came 0.022 which is statistically significant. Active vitiligo, segmental vitiligo and increased duration of vitiligo were determined to be independent predictors of metabolic syndrome.
Conclusion: The risk of developing metabolic syndrome is increased in patients of vitiligo. Screening and the close follow up of the patients of vitiligo with clinical feature such as in unstable, segmental vitiligo with increased duration is necessary for the early diagnosis of the metabolic syndrome to reduce the morbidity & mortality of the patients.

1. Introduction

Vitiligo is an acquired disorder of the skin and mucous membranes that is characterized by well circumscribed macules and patches and that occurs secondarily to selective destruction of melanocytes.[1]

The vitiligo has complex, multifactorial and largely unknown etiopathogenesis. Several theories have been proposed to explain the pathogenesis of vitiligo such as role of genetics, oxidative stress, autoimmune, neurohumoral, melanocytorrhagy, viral infection and autocytotoxicity. Although none of them is mutually exclusive, and it is likely that they each contribute partially towards it.[1]

The prevalence of vitiligo ranges from 0.5% to 1%. Its highest incidence has been reported amongst Indians from the Indian subcontinent. India is considered to have the highest prevalence in the world, at about 8.8%. Mexico and Japan also has high prevalence of vitiligo.[2]

The metabolic syndrome or the insulin resistance syndrome are the terms used to describe a constellations of metabolic derangements that includes insulin resistance, hypertension, Dyslipidemia, central or visceral obesity, type 2 DM & accelerated cardiovascular disease.[3]

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An oxidative imbalance is responsible for the development of both metabolic syndrome & vitiligo. Melanin in the adipose tissue has both anti-inflammatory and antioxidant effects. A lower number of melanocytes as well as decreased melanogenesis in the adipose tissue might reduce the anti-inflammatory effects of the Melanocytes and cause an increased production of the free oxygen radicals in vitiligo which is responsible for the metabolic syndrome.[4]

Other mechanism may contribute to the development of metabolic syndrome in patients of vitiligo such as insulin resistance, lipid profile disturbances & other metabolic disorders, due to the increased inflammatory cytokines and autoimmune reactions of the melanocytes.[5,6]

2. Materials and Methods

Total forty (40) patients with clinically diagnosed vitiligo and forty (40) age & sex matched controls were chosen and written consent was taken to participate during the study period. A detailed history of onset, duration, progression and associated symptoms were obtained from the patients and their parents. Relevant past history, family history and drug intake prior the onset of the disease is recorded. General and systemic examination was done.

Dermatological examination was carried out. Morphology, distribution, progression and various special features were recorded. Oral and genital mucosa were examined. All routine investigations including haemoglobin, total leukocyte count, differential count, hepatic and renal profile was done. Special investigation like Lipid Profile, Fasting blood sugar level & Body mass index (BMI) measurement was done. The results was analysed and discussed in detail.

2.1. Inclusion criteria

1. All new patients with vitiligo presenting to RDGMC institution.
2. All male/female patients of age group 10-80 yrs.
3. Patients who have given consent for the study.

2.2. Exclusion criteria

1. Patients who are not cooperative or not willing to participate in the study.
2. Immunocompromised patients.

3. Results

As per national cholesterol education program (2001, 2005).[7]

Metabolic syndrome diagnosis is made when there is presence of three or more of the following five:

In our study total 40 vitiligo patients were assessed with 40 age matched control subjects. Fasting Glucose, Cholesterol Triacylglycerol, LDL, HDL, Waist Circumference, Systolic and diastolic blood pressure were measured. There was significant difference was observed in Fasting Glucose level in cases when compared to control with p value of 0.03. Waist Circumference and blood pressure (systolic & diastolic) also showed significant difference when compared to control. In Vitiligo patients the level of serum Triglyceride was found higher and shows highly significant when compared with control with a P value of 0.033. The levels of HDL in Vitiligo patients were highly significant when compared with control With a P value of. In our study Metabolic syndrome was present in 15 cases in comparision to 6 controls which came out to be statistically significant with a p-value of 0.022.

Table 1:

Diagnostic Criteria (Any 3 Below)	Value
Waist circumference	Male >=102 cm in men Female >=88 cm in women
Triglycerides	> 150 mg/d
HDL cholesterol	Male <40mg/dl Female <50mg/dl
fasting blood glucose	> 100 mg/dL
Blood pressure	130/ 85 mm Hg (Systolic/Diastolic)

Table 2:

Parameters	Our study		
	Cases (Mean±SD)	Controls (Mean±SD)	P Value
Fasting blood glucose	104±14.3	98±19.2	0.03
Systolic blood Pressure	116.6±10.8	114±12.8	0.04
Diastolic blood Pressure	76.4±52	74.6±4.6	0.00
Waist Circumference	86.2±12.4	84.5±11	0.02
S. Triglyceride	174.21±55	138±26	0.033
S. HDL	49.8±8.2	51.90±5.91	0.145

4. Discussion

The etiopathogenesis of Vitiligo is complex, multifactorial and largely unknown.[10] The initial event in pathophysiology is considered to be the intrinsic defect in melanocytes. In this, oxidative stress in melanocytes is leading to a local inflammatory response and the start of innate immune processes, which in subjects genetically predisposed individual leads to development of autoimmunity, forms melanocyte-specific cytotoxic immune responses.[11] Similarly in Metabolic syndrome. Oxidative stress plays an important role leading to its development. In this syndrome accumulation of plasma free fatty acid increases the production of Reactive Oxygen Species by stimulating NOX and decreasing the antioxidant enzyme activity resulting in disturbance in glucose metabolism,

Table 3: On comparision above studies with our study following results was obtained

Parameters	Our study		Hatice Ataş, Müzeyyen Gönül[8]		P. K. Sinha, Prashant Nigam, J. P. Swain[9]	
	Cases (Mean±SD)	Controls (Mean±SD)	Cases (Mean±SD)	Controls (Mean±SD)	Cases (Mean±SD)	Controls (Mean±SD)
Fasting blood glucose	104±14.3	98±19.2	97.1 ±26.1	92.7 ±21.2	101.56±14.3	98±19.67
Systolic blood Pressure	116.6±10.8	114±12.8	124.6 ±16.8	124 ±11.5	118.4±11.5	116±13.4
Diastolic blood Pressure	76.4±52	74.6±4.6	70.6 ±11.2	70.7 ±9.5	79.4±7.1	78.4±5.8
Waist Circumference	86.2±12.4	84.5±11	94.3 ±13.7	95.1 ±12.3	81.35±10.2	84.45±09.5
S. Triglyceride	174.21±55	138±26	157.9 ±70.2	140.7 ±52.7	184.21±59.4	142.59±29.3
S. LDL	119±12	81±14	113±11	86±11.1	123±19.32	89.65±12.1

dyslipidaemia, hypertension and abdominal obesity which are the most common manifestations of Metabolic syndrome.[12] Thus oxidative stress is major reason due to which there is increased predisposition of developing metabolic syndrome in patients of vitiligo.

In our present study Metabolic syndrome was present in 15 vitiligo cases in comparision to 6 non vitiligo cases.

This variable too had statistically significant association with vitiligo like other previously done studies.

P. K. Sinha, Prashant Nigam, J. P. Swain[9] In the study, they selected 75 subjects with age matched 75 controls and they found significant differences in Serum HDL ($p < 0.001$), and Triglyceride levels ($p < 0.001$) only. However, In this study there was no significant difference in waist circumference, plasma glucose and blood pressure between cases and controls. Thus the study observed interrelation between Vitiligo and development of metabolic syndrome.

In another study conducted by Hatice Ataş, Müzeyyen Gönül,[8] Metabolic Syndrome was diagnosed in 24 (38.1%) subjects with vitiligo and 14 (21.5%) subjects without vitiligo. No significant differences were observed in the age, gender or other demographic or clinical characteristics, except for Metabolic Syndrome in between the vitiligo and control groups. (116) Active vitiligo, segmental vitiligo, increased duration of vitiligo and were determined as independent predictors for Metabolic Syndrome. (117)

5. Conclusion

This study was directed to assess the association of Metabolic Syndrome in patients with vitiligo. Our study showed that All the variables in lipid Profile i.e. Triglyceride, HDL , VLDL were Significantly deranged in the vitiligo group in comparision to non vitiligo group and also p-value of each parameters came out to be statistically significant. Screening and the close follow-up of vitiligo patients with poor clinical features, as in active, extended, segmental vitiligo with an increased duration, for the early diagnosis and treatment of MetS, can reduce the morbidity and mortality.

6. Conflict of Interest

No conflict of interest was declared by the authors.

7. Source of Funding

None.

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