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Original Research Article

Association of metabolic syndrome in patients with vitiligo

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ABSTRACT

Background: Vitiligo can trigger inflammatory processes due to decreased number of melanocytes and their anti-inflammatory effects as well as oxidative stress. Metabolic syndrome includes hypertension, abdominal obesity, dyslipidemia, glucose intolerance, leading to cardiovascular disease, diabetes mellitus and stroke. Because of the systemic nature of vitiligo, metabolic syndrome or its component may be observed in vitiligo. To observe association of metabolic syndrome in patients with vitiligo.

Methods: This case control study included 54 vitiligo patients and 54 age and sex matched controls according to inclusion and exclusion criteria. Detailed history, physical examination and laboratory investigations were done in all participants and revised National Cholesterol Education Program Adult Treatment Panel III criteria were used for diagnosis of metabolic syndrome. Data were analyzed by using SPSS (Statistical Package for Social Sciences) Version 23.

Results: Metabolic syndrome was present in 20 (37.0%) patients with vitiligo and in 9 (16.7%) control subjects. Frequency of metabolic syndrome was significantly higher in vitiligo patient compared to control (p=0.017). Systolic blood pressure, diastolic blood pressure, fasting plasma glucose and mean serum triglycerides level were significantly higher in the patient group than that of control group, whereas serum high density lipoprotein cholesterol was significantly lower in the patient group than that of control group. There were no significant difference between cases and controls regarding waist circumference.

Conclusions: Presence of metabolic syndrome was higher in patients with vitiligo. Further large-scale studies are needed to establish it.

Keywords: Cardiovascular disease, Metabolic syndrome, Type 2 diabetes, Vitiligo

INTRODUCTION

Vitiligo is a chronic, acquired pigmentary disorder of melanocytes characterized by hypopigmented or depigmented macules and patches of the skin, mucous membranes and hairs which may be accompanied by sensorineural deafness, uveitis and thyroiditis.[1] Vitiligo affects 0.5–2% of the population worldwide, but more than 8.8% in some areas of India. It affects both sexes and all ages equally with incidence high at 10-30 years of age.[2] About 30% of patients have positive family history. Various disorders are associated with vitiligo, like hypo and hyperthyroidism, pernicious anaemia, Addison's disease, diabetes mellitus, hypoparathyroidism,

myasthenia gravis, alopecia areata, morphea, lichen sclerosus, halo nevus and malignant melanoma. Six types of vitiligo have been described as localized or focal, segmental, generalized, universal, acrofacial and mucosal. The generalized pattern is most common. Which are usually diagnosed clinically and by using a Wood's lamp.

It is a multifactorial, polygenic disorder, the exact etiology and pathogenesis of which is not yet well understood. There are many potential pathophysiological theories involving autoimmune, neural, autocytotoxic, biochemical, oxidative stress, melanocytorrhagy and decreased melanocyte survival hypothesis.[3] Tumor necrosis factor-α (TNF-α), interferon-γ (IFN-γ), IL-1, IL-6, IL-10 and IL-17 have been demonstrated to be associated with vitiligo pathogenesis and a significant increase in the expression of IFN- γ, TNF-α, IL-10 in involved and adjacent uninvolved skin in vitiligo patients has also been seen.[4] Metabolic syndrome is a cluster of disorders that involve central obesity, insulin resistance (IR), impaired glucose metabolism, hypertension and dyslipidemia, associated with cardiovascular disease (CVD) risk and type 2 diabetes (T2D).[5]

The pathogenic mechanisms of metabolic syndrome are complex, including insulin resistance, neurohormonal activation and chronic inflammation. Insulin resistance causes release of pro-inflammatory cytokines from the adipose tissue and associated with the generation of reactive oxygen species (ROS). ROS initiates a vicious cycle of inflammation, endothelial damage and fibroblast proliferation that contributes to the development of hypertension, dyslipidemia, diabetes, cardiac hypertrophy and CVD. Inflammation and inflammatory markers have been shown to be elevated in patients with metabolic syndrome. Elevated serum TNF-α and Interleukin 6 (IL-6) levels are associated with obesity, insulin resistance, the development of diabetes and CVD.[6] The chronic and systemic Th-1 mediated inflammation of vitiligo characterized by increased levels of pro-inflammatory cytokines, such as tumor necrosis factor-α and interleukin-6, play a key role in pathogenesis of vitiligo as well as metabolic syndrome.[7]

On the other hand, oxidative stress, loss of melanocytes and melanin pigments in adipose tissues causes production of reactive oxygen species (ROS), that has been implicated in the shared pathogenesis of both vitiligo and metabolic syndrome.[8] Oxidative stress can cause obesity by two-step adipogenesis includes proliferation of pre-adipocyte and their differentiation into mature adipocyte. Reactive oxygen species have been shown to be involved both of these events.[9] But other studies have suggested that, there is no relationship between vitiligo and metabolic syndrome.[7,10] Found no significant difference in the prevalence of metabolic syndrome between the vitiligo patients and the controls (35.6% vs 33.3%, p=0.779).[10] Also observed no significant difference in the prevalence of metabolic syndrome between the vitiligo patients and the controls (20.6% vs 30.3%, p=0.084).[7] Moreover, association of metabolic syndrome in vitiligo patients have shown variations in above discussion. Apart from this, an increasing frequency of metabolic syndrome may impose a substantial burden on the overall health of vitiligo patients that needs to be appropriately foreseen and addressed. Therefore, this study was planned to see the association of metabolic syndrome in patients with vitiligo taking a control arm.

METHODS

A case-control study was conducted in the Department of Dermatology and Venereology, Bangladesh Medical University (BMU) from March 2021 to August 2022. Among 54 patients of vitiligo and 54 controls as per the inclusion and exclusion criteria.

Inclusion criteria

Diagnosed case of vitiligo by clinically and using wood's lamp, age ≥18 years were included.

Exclusion criteria

Pregnancy, type-1 DM, secondary HTN, alcoholism, current smoking were excluded.

History of medical conditions or drugs known to affect-Other autoimmune diseases (Rheumatoid arthritis, Inflammatory bowel disease, Lupus erythematosus), psoriasis, use of oral immunosuppressive or systemic corticosteroids and women on hormone replacement therapy. Participants are unwilling to give written consent to undergo the study

Metabolic syndrome

The diagnosis of metabolic syndrome was based on the criteria of revised National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III), with Asian modification for abdominal circumference. The criteria are increased waist circumference. In Asian population, ≥90 cm in males and ≥80 cm in females. Raised triglycerides ≥150 mg/dl (or on treatment for raised triglycerides). Decreased HDL-C <40 mg / dl in men and <50 mg/dl in women (or on treatment for reduced HDL-C). Increased blood pressure, systolic ≥130 and / or diastolic ≥85 mmHg (or on treatment for hypertension); and increased fasting plasma glucose ≥5.6 mmol/l (or on treatment for increased plasma glucose). The presence of any 3 or more of these 5 risk factors constitutes a diagnosis of metabolic syndrome.

Study procedure

Both quantitative and qualitative data were collected by using pre designed questionnaire designed for the study. The questionnaire was prepared reviewing literature and by consulting with supervisor, co-supervisor and experts. Before enrolment in this study informed written consent was obtained from the participants after full explanation of

the purpose of the study. Thorough history including age, gender, smoking, diabetes mellitus, hypertension, onset of vitiligo and concomitant medications were taken and relevant physical examination including recording of weight, height, body mass index (BMI), blood pressure and waist circumference was done.

Statistical analysis

Data were processed and were analyzed manually and by using SPSS (Statistical Package for Social Sciences) Version 23. Quantitative data were expressed by mean and standard deviation; and comparison were done between the groups by unpaired "t" test. Qualitative data were expressed by frequency and percentage; and comparison were carried out between two groups by Chi-square ($\chi 2$) test. A probability value<0.05 ($p<0.05$) was considered statistically significant, p value<0.01 considered highly significant and p value>0.05 considered non- significant.

RESULTS

The age of the patients with vitiligo ranged from 18 to 68 years with the mean age of 33.52±13.46 years, whereas the age of the control subjects ranged from 18 to 61 years with the mean age of 30.28±10.11 years. The mean age did not differ significantly between patients with vitiligo and control subjects (t=1.415, p=0.160).

Among the patient with vitiligo, 24 (44.4%) patients were in the age group of 21-30 years, 9 (16.7%) patients were in the age group of 31-40 years, 8 (14.8%) patients were in the age group of 51-60 years, 7 (13.0%) patients were in the age group of up to 20 years, 5 (9.3%) patients were in the age group of 41-50 years and 1 (1.9%) patients were in the age group of 61-70 years ; whereas in control group 26 (48.1%) patients were in the age group of 21-30 years, 15 (27.8%) patients were in the age group of 31-40 years, 6 (11.1%) patients were in the age group of up to 20 years, 4 (7.4%) patients were in the age group of 41-50 years, 2 (3.7%) patients were in the age group of 51-60 years and 1 (1.9%) patients were in the age group of 61-70 years. The age did not differ significantly between patients with vitiligo and control subjects when categorized in different age group (p=0.373) (Table 1).

There were 33 (53.7) male and 21 (46.3) female in patients with vitiligo, whereas 29 (61.1%) male and 25 (38.9%) female in control group. There was no significant difference of sex between two groups ($\chi 2=0.606$, p=0.436) (Figure 1). The mean waist circumference was 85.02±8.0 cm in patients with vitiligo (case) and 85.76±5.63 cm in control subject. The mean waist circumference did not differ significantly between vitiligo group and control group (p=0.580). The mean systolic blood pressure was 122.69±10.85 mmHg in patients with vitiligo (case) and 117.69±10.08 mmHg in control subject. Mean systolic blood pressure was significantly higher in vitiligo group than that of control group (p=0.015). The mean diastolic blood pressure was 77.96±9.93 mmHg in patients with vitiligo (case) and 73.94±9.34 mmHg in control subject. Mean diastolic blood pressure was significantly higher in vitiligo group than that of control group (p=0.033) (Table 2).

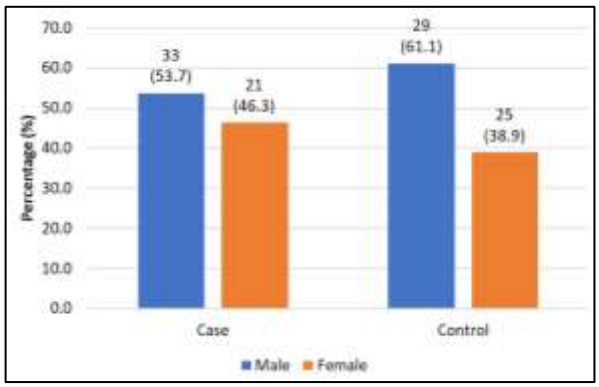

Figure 1: Distribution of the study subject by gender (n=108).

The mean fasting plasma glucose was 5.81±1.80 mmol/l in patients with vitiligo (case) and 5.21±0.50 mmol/l in control subjects. The mean fasting plasma glucose was significantly higher in vitiligo group than that of control group (p=0.013). Mean serum total cholesterol level was 190.28±44.58 mg/dl in patients with vitiligo (case) and 178.46±32.91 mg/dl in control subjects. Mean serum total cholesterol level did not differ significantly between vitiligo group and control group (p=0.120).

Mean serum HDL cholesterol level was 40.83±8.16 mg/dl in vitiligo group and 43.89±6.84 mg/dl in control group. Mean serum HDL cholesterol level was significantly lower in vitiligo group than that of control group (p=0.037). Mean serum triglyceride level was 170.35±72.38 mg/dl in vitiligo group and 139.43±58.20 mg/dl in control. Mean serum triglyceride level was significantly higher in vitiligo group than that of control group (p=0.016). Mean serum LDL cholesterol level was 117.50±29.22 mg/dl in vitiligo group and 104.99±27.05 mg/dl in control group. Mean serum LDL cholesterol level was significantly higher in vitiligo group and control group (p=0.022) (Table 3).

Blood pressure (≥130/85 mmHg) was raised in 14 (25.9%) patients with vitiligo and in 4 (7.4%) control subjects. Blood pressure was significantly higher in vitiligo patient compared to control (p=0.010). Waist circumference (≥90 cm for males and ≥80 cm for females) was increased in 28 (51.9%) patients with vitiligo and in 25 (46.3%) control subjects. Waist circumference did not differ significantly between two groups (p=0.564). Impaired fasting plasma glucose (≥5.6 mmol/l) was high in 22 (40.7%) patients with vitiligo and in 10 (18.5%) control subjects. Impaired fasting plasma glucose was significantly higher in vitiligo patient compared to control (p=0.010). Low serum HDL cholesterol (<40 mg/dl for males and <50 mg/dl for females) was in 33 (61.1%) patients with vitiligo and in 22 (40.7%) control subjects. Low serum HDL cholesterol was

significantly higher in vitiligo patient compared to control (p=0.034). In the present study hypertriglyceridemia (TG ≥150 mg/dl) was in 23 (57.1%) patients with vitiligo and in 21 (38.91%) control subjects. Hypertriglyceridemia did not differ significantly between two groups (p=0.695) (Table 4). Metabolic syndrome was present in 20 (37.0%) patients with vitiligo and in 9 (16.7%) control subjects. Frequency of metabolic syndrome was significantly higher in vitiligo patient compared to control (p=0.017) (Table 5). The mean age was 41.60±13.72 years in patients with metabolic syndrome and was 28.71±10.83 years in patients without metabolic syndrome. The mean age was significantly higher in vitiligo patients with metabolic syndrome compared to vitiligo patients without metabolic syndrome (p<0.001). There were 11 (55.0%) males in vitiligo patients with metabolic syndrome and 18 (52.2) males in vitiligo patients without metabolic syndrome.

Sex did not differ significantly in vitiligo patients with metabolic syndrome compared to vitiligo patients without metabolic syndrome (p=0.884). The BMI was 26.58±2.25 in patients with metabolic syndrome and was 24.61±2.44 in patients without metabolic syndrome. The BMI was significantly higher in vitiligo patients with metabolic syndrome compared to vitiligo patients without metabolic syndrome (p<0.001).

Frequency of elevated blood pressure (≥130/85 mmHg) was significantly higher in 12 (60.0%) vitiligo patients with metabolic syndrome compared to 2 (5.9%) vitiligo patients without metabolic syndrome (p<0.001). Frequency of increased waist circumference (≥90 cm for males and ≥80 cm for females) was significantly more in 19 (95.0%) vitiligo patients with metabolic syndrome compared to 9 (26.5%) vitiligo patients without metabolic syndrome (p<0.001). Impaired fasting plasma glucose (≥5.6 mg/dl) was significantly more in 15 (75.0%) vitiligo patients with metabolic syndrome compared to 7 (20.6%) vitiligo patients without metabolic syndrome (p<0.001). Low serum HDL cholesterol (<40 mg/dl for males and <50 mg/dl for females) was significantly more in 17 (85.0%) vitiligo patients with metabolic syndrome compared to 16 (47.06%) vitiligo patients without metabolic syndrome (p=0.006). Hypertriglyceridemia (≥150 mg/dl) was significantly more in 15 (75.0%) vitiligo patients with metabolic syndrome compared to 8 (23.5%) vitiligo patients without metabolic syndrome (p<0.001) (Table 6).

The mean duration of vitiligo was 9.31±7.68 years in patients with metabolic syndrome and was 4.73±4.70 years in patients without metabolic syndrome. The mean duration of vitiligo was longer in patients with metabolic syndrome than that without metabolic syndrome (p=0.009). Duration of vitiligo (≥10 years) was in 10 (50.0%) of patients and <10 years in 10 (50.0%) of patients with metabolic syndrome; whereas duration of vitiligo (≥10 years) was in 3 (8.8%) of patients and <10 years in 31 (91.2%) of patients without metabolic syndrome.

Duration of vitiligo (≥10 years) was significantly higher frequent in patients with metabolic syndrome than that without metabolic syndrome (p=0.001). Among vitiligo patients with metabolic syndrome, 11 (55.0%) patients were in generalized type, 7 (35%) patients were in focal type and 2 (10%) were in acrofacial type. Among vitiligo patients without metabolic syndrome, 15 (44.1%) patients were in generalized type, 8 (23.5%) patients were in focal type, 7 (20.6%) were in acrofacial type, 2 (5.9%) patients were in mucosal type and 2 (5.9%) were in segmental type. Metabolic syndrome did not differ significantly between different types of vitiligo (p=0.392) (Table 7).

Table 1: Age distribution of the participants (n=108).

Age (in years)	Study subjects		P value
	Case (n=54)	Control (n=54)	
≤20	7 (13.0)	6 (11.1)	
21-30	24 (44.4)	26 (48.1)	
31-40	9 (16.7)	15 (27.8)	0.373*
41-50	5 (9.3)	4 (7.8)	
51-60	8 (14.8)	2 (3.7)	
61-70	1 (1.9)	1 (1.9)	
Mean±SD	33.52±13.46	30.28±10.11	0.160

*Statistically significant.

Table 2: Distribution of the participants by waist circumference, blood pressure (n=108).

Study subjects	Case (n=54)	Control (n=54)	P value*
Waist circumference (cm)	85.02±8.0	85.76±5.63	0.580
Blood pressure (mmHg)			
Systolic blood pressure	122.69±10.85	117.69±10.08	0.015
Diastolic blood pressure	77.96±9.93	73.94±9.34	0.033

*Statistically significant.

Table 3: Laboratory findings of study subjects (n=108).

Laboratory findings	Study subjects		P value
	Case (n=54)	Control (n=54)	
Fasting plasma glucose (mmol/l)	5.81±1.80	5.21±0.50	0.013
S total cholesterol (mg/dl)	190.28±44.58	178.46±32.91	0.120
S HDL-C (mg/dl)	40.83±8.16	43.89±6.84	0.037
S. triglyceride (mg/dl)	170.35±72.38	139.43±58.20	0.016
S. LDL-C (mg/dl)	117.50±29.22	104.99±27.05	0.022

Table 4: Distribution of the participants by components of metabolic syndrome (n=108).

Components of metabolic syndrome	Study subjects		P value
	Case (%) (n=54)	Control (%) (n=54)	
Elevated blood pressure (mmHg)	14 (25.9)	4 (7.4)	0.010
Increased waist circumference (cm)	28 (51.9)	25 (46.3)	0.564
Impaired fasting plasma glucose (mmol/l)	22 (40.7)	10 (18.5)	0.010
Low serum HDL cholesterol (mg/dl)	33 (61.1)	22 (40.7)	0.034
Increased serum triglyceride (mg/dl)	23 (42.6)	21 (38.9)	0.695

Table 5: Comparison of metabolic syndrome among cases(vitiligo) and controls (n=108).

Metabolic syndrome	Study subjects		Odds ratio (95% CI)	P value
	Case (%) (n=54)	Control (%) (n=54)		
Present	20 (37.0)	9 (16.7)	2.941 (1.191-7.263)	0.017
Absent	34 (63.0)	45 (83.3)		
Total	54 (100.0)	54 (100.0)		

Table 6: Characteristics of vitiligo patients with and without metabolic syndrome (n=54).

Variables	Vitiligo patients		P value
	With metabolic syndrome (%) (n=20)	Without metabolic syndrome (%) (n=34)	
Age (in years) mean±SD	41.60±13.72	28.71±10.83	<0.001
Sex (male)	11 (55.0)	18 (52.9%)	0.884
BMI	26.58± 2.25	24.61±2.44	<0.001
Elevated blood pressure (≥130/85 mmHg)	12 (60.0)	2 (5.9)	<0.001
Waist circumference (≥90 cm for males and ≥80 cm for females)	19 (95.0)	9 (26.5)	<0.001
Impaired fasting plasma glucose (≥5.6 mg/dl)	15 (75.0)	7 (20.6)	<0.001
Low serum HDL cholesterol (<40 mg/dl for males and <50 mg/dl for females)	17 (85.0)	16 (47.06)	0.006
Increased serum triglyceride (≥150 mg/dl)	15 (75.0)	8 (23.5)	<0.001

Table 7: Relationship between duration & types of vitiligo and metabolic syndrome (n=54).

Duration of vitiligo	Vitiligo patients		P value
	With metabolic syndrome (%) (n=20)	Without metabolic syndrome (%) (n=34)	
Mean±SD (years)	9.31±7.68	4.73±4.70	0.009
≥10 years	10 (50.0)	3 (8.8)	0.001
<10 years	10 (50.0)	31 (91.2)	
Total	20 (100.0)	34 (100.0)	
Types of vitiligo			
Generalized	11 (55.0)	15 (44.1)	0.392
Focal	7 (35.0)	8 (23.5)	
Acrofacial	2 (10)	7 (20.6)	
Mucosal	0 (0.0)	2 (5.9)	
Segmental	0 (0.0)	2 (5.9)	
Total	20 (100.0)	34 (100.0)	

DISCUSSION

This case control study was carried out with the aim to observe the association of metabolic syndrome in patients with vitiligo. Among 54 patients of vitiligo and 54 controls as per the inclusion and exclusion criteria. In this study the mean age of the patients with vitiligo was 33.52±13.46 years; whereas the mean age of the control subjects was 30.28±10.11 years; difference was not significant (p=0.160) suggesting an age matched study. Similar age distribution was reported in the study of Sallam et al showing the mean age of the patients with vitiligo was 32.73±16.27 years.[7]

This result also consistent with the study by Namazi et al, that the mean age of the patients with vitiligo was 37.61±12.27 years.[11] Meymandi et al reported the mean age of their patients with vitiligo as 32.42±13.89 years.[8] Gourh et al, found that the mean age of the patients with vitiligo was 35.98±15.48 years.[12] While Sharma et al, found higher age distribution with mean age 43.5±10.5 years.[13] The higher mean age may be due to exclusion of younger subjects. There was 53.7% male and 46.3% female in patients with vitiligo; whereas 61.1% male and 38.9% female in control group in this study; difference was not significant (p=0.436). So this study was a sex matched study. This result correlated with the study of Namazi et al, that 53.0% of vitiligo patients were male and 47.0% of patients were female.[11] Rashed et al, also observed that 53.3% of patients with vitiligo was male and 46.7% were female in their study.[10]

In the current study the mean systolic blood pressure was 122.69±10.85 mm-Hg in patients with vitiligo (case) and 117.69±10.08 mmHg in control subject.[14] The mean diastolic blood pressure was 77.96±9.93 mmHg in patients with vitiligo (case) and 73.94±9.34 mmHg in control subject. Mean diastolic blood pressure was significantly higher in vitiligo group than that of control group (p=0.033).[15] It was shown that blood pressure (≥130/85 mmHg) was raised in 14 (25.9%) patients with vitiligo and 4 (7.4%) in control subjects.8 Mean waist circumference was 85.02±8.0 cm in patients with vitiligo (case) and 85.76±5.66 cm in control subject.

Mean waist circumference did not differ significantly between vitiligo group and control group (p=0.580).[14] This revealed that waist circumference (≥90 cm for males and ≥80 cm for females) was increased in 28 (51.9%) patients with vitiligo and in 25 (46.3%) control subjects.[8] In the current study the mean fasting plasma glucose was 5.81±1.8 mmol/l in patients with vitiligo (case) and 5.21±0.50 mmol/l in control subject.[16] Impaired fasting plasma glucose (≥5.6 mmol/l) was in 22 (40.7%) patients with vitiligo and in 10 (18.5%) control subjects in this study Sharma et al.[13] Total cholesterol level was 190.28±44.58 mg/dl in patients with vitiligo (case) and 178.46±32.91 mg/dl in control subject Sinha et al.[17] Mean serum HDL cholesterol level was 40.83±8.16 mg/dl in vitiligo group and 43.89±6.84 mg/dl in control group in this study Sharma et al.[13] Stated that low serum HDL cholesterol (<40 mg/dl for males and <50 mg/dl for females) was in 33 (61.1%) patients with vitiligo and in 22 (40.7%) control subjects. In the present study mean serum triglyceride level was 170.35±72.38 mg/dl in vitiligo group and 139.43±58.20 mg/dl in control.[13] In this study hypertriglyceridemia (≥150 mg/dl) was in 23 (42.6%) patients with vitiligo and in 21 (38.9%) control subjects.

This study revealed that mean serum LDL cholesterol level was 117.50±29.22 mg/dl in vitiligo group and 104.99±27.05 mg/dl in control group.[8] In this study metabolic syndrome was present in 20 (37.0%) patients with vitiligo and in 9 (16.7%) control subjects. Frequency of metabolic syndrome was significantly higher in vitiligo patient compared to control (p=0.017). This result was consistent with the study of Namazi et al where metabolic syndrome was present in 24 (34.34%) of patients with vitiligo and 10 (14.30%) of control subjects.[11]

Frequency of metabolic syndrome was significantly higher in vitiligo patient compared to control (p=0.007). Sharma et al, also found that the predominance of metabolic syndrome was significantly higher in the vitiligo group than in the control group (24 vs 12, OR=2.32, 95% CI=1.08-4.94, p<0.05).[13] Tanacon et al and Atakan et al, reported that that metabolic syndrome was significantly more in vitiligo patients than in controls (37.4% vs 19.4%, p<0.001).[14] Found that metabolic syndrome was significantly more common in vitiligo patients than in controls (38.1% vs 21.5%, odds ratio 2.2, p-value=0.04).[18]

This result also was consistent with the study of Adday et al, that metabolic syndrome was present in 26 (59.00%) of male patients with vitiligo and 18 (41.00%) of control subjects and 11 (38.00%) of female patients with vitiligo and 9 (24.00%) of control subjects.[5] Frequency of metabolic syndrome was significantly higher in vitiligo patient compared to control (p<0.02). But Salman et al, reported metabolic syndrome did not differ between vitiligo group and control (23.6% vs 18.3%, p-value=0.3).[19] It may be due to inclusion of low age group in the study. This study showed that the mean duration of vitiligo was 9.31±7.68 years in patients with metabolic syndrome and was 4.73±4.70 years in patients without metabolic syndrome.

CONCLUSION

This study revealed that the components of metabolic syndrome such as elevated blood pressure, impaired fasting plasma glucose, low serum HDL cholesterol and high mean serum triglyceride were statistically significant in vitiligo group, whereas raised values of waist circumference as a measure of central obesity was not statistically significant. From the findings of this study, it may conclude that, metabolic syndrome was found significantly more frequent in vitiligo patients than in controls.

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REFERENCES

1. Marchioro HZ, Castro CCSD, Fava VM. Update on the pathogenesis of vitiligo. Anais Brasileiros de Dermatologia. 2022;97(4):478-90.
2. Bergqvist C, Ezzedine K. Vitiligo: a review. Dermatology. 2020;236(6):571-92.
3. Allam M, Riad H. Concise review of recent studies in vitiligo. Qatar Med J. 2014;2013(2):10.
4. Mohammed GF, Gomaa AH, Al-Dhubaibi MS. Highlights in pathogenesis of vitiligo. World J Clin Cases. 2015;3(3):221.
5. Adday NS, Ajlan SK, Al-Hamdi KI. Metabolic Syndrome and Vitiligo: The Relationship. University of Thi-Qar J Med. 2022;23(1):69-77.
6. Rochlani Y, Pothineni NV, Kovelamudi S. Metabolic syndrome: pathophysiology, management and modulation by natural compounds. Therap Advan Cardiovas Dis. 2017;11(8):215-25.
7. Sallam M, Gaballah MA, Al-Harrass M. Metabolic syndrome in Egyptian patients with vitiligo: a case–control study. J Egypt Women's Dermatol Soc. 2017;14(2):100-5.
8. Meymandi SS, Aflatoonian M, Khalili M. Prevalence of Metabolic Syndrome in Vitiligo Patients in Comparison With the Control Group. Hormozgan Med J. 2022;26(3):141-4.
9. Rani V, Deep G, Singh RK. Oxidative stress and metabolic disorders: Pathogenesis and therapeutic strategies. Life Sci. 2016;148:183-93.
10. Rashed EA, Fouda I, Elgmal E. Evaluation of the prevalence and risk of metabolic syndrome in vitiligo patients. Int J Med Arts. 2019;1(2):91-7.
11. Namazi N, Amani M, Haghighatkhah HR. Increased risk of subclinical atherosclerosis and metabolic syndrome in patients with vitiligo: a real association or a coincidence. Dermatol Ther. 2021;34(2):14803.
12. Gourh V, Arya A, Dubey A. Study of metabolic syndrome in patients of Vitiligo: A single-center observational study. Asian J Med Sci. 2022;13(9):168-73.
13. Sharma YK, Bansal P, Menon S. Metabolic syndrome in vitiligo patients among a semi-urban Maharashtrian population: a case control study. Diabet Met Syndr: Clin Res Rev. 2017;11(1):77-80.
14. Tanacan E, Atakan N. Higher incidence of metabolic syndrome components in vitiligo patients: a prospective cross-sectional study. Anais Brasil Dermatol. 2020;95(2):165-72.
15. Aryanian Z, Shirzadian A, Farzaneh S. Metabolic derangement in patients with vitiligo: a cross-sectional study. J Invest Med. 2022;70(4):963-6.
16. Varma K, Kumar U, Mahadik A. ssociation of metabolic syndrome in patients of vitiligo. Indian J Clin Exp Dermatol. 2021;7(4):337-40.
17. Sinha PK, Nigam P, Swain JP. Association of metabolic syndrome with vitiligo. a case control study. J Evol Med Dental Sci. 2019;8(36):2783-7.
18. Hatice ATAS, Gönül, M. Increased risk of metabolic syndrome in patients with vitiligo. Balkan Med J. 2017:34(3):219-25.
19. Salman HA, Abdulkareem SR. Metabolic Syndrome in Iraqi Patients with Vitiligo. Am J Dermatol Venereol. 2020;9(3):43-6.

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