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METABOLIC SYNDROME;

FREQUENCY OF METABOLIC SYNDROME IN PATIENTS OF SYSTEMIC LUPUS ERYTHEMATOSUS

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ABSTRACT… Introduction: Systemic lupus erythematosus (SLE) is a multiorgan autoimmune disease with an increased incidence rate of thrombotic events (9–37%). Metabolic syndrome (MetS) may contribute to increased cardiovascular risk in (SLE). The Metabolic syndrome is more prevalent in SLE patients than the general population and is associated with endothelial injury and coronary atherosclerosis. **Objective:** To determine the frequency of metabolic syndrome in systemic lupus erythematosus (SLE), patients presenting in a tertiary care hospital. **Study Design:** Cross-sectional survey. **Study Settings:** Medical out-patient Department of Jinnah Hospital Lahore. **Duration of Study:** Six months duration from 25th June 2014 to 26th December 2014). **Subjects and Methods:** Non-probability purposive sampling was done on 78 SLE patients (as per operational definition), which were enrolled after obtaining their written informed consent. Metabolic syndrome was labeled as per operational definition. Data was recorded on a specially designed performa. **Results:** From 78 cases of SLE there were 4% male and 96% were female. The mean age was 20- 60 years with standard deviation of 40.21±10.67 years. It was observed that there were 38.5% cases of SLE with family history of CHD, 66.67% patients of SLE were smokers, 48.7% patients had central obesity, 47.4% patients had high fasting blood glucose, 44.9% cases were with low HDL and 39.7% patients had high blood pressure. Metabolic syndrome was found in 33.3% patients of SLE. Metabolic syndrome was significantly associated with high blood pressure (p= 0.00), central obesity (p= 0.00), high blood glucose (p= 0.00), low HDL (p= 0.00) and gender p=0.01) but association with age (p=0.33), smoking (p=0.73) and family history of CHD (p=0.32) was not significant. **Conclusion:** The frequency of metabolic syndrome in SLE patients presenting in a tertiary care hospital was found to be 33%. Metabolic syndrome was significantly associated with SLE.

Key words: Systemic Lupus Erythematosus, Central Obesity, Coronary Artery Disease, metabolic syndrome.

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INTRODUCTION

Systemic lupus erythematosus (SLE) is a chronic inflammatory disease that can affect many organs of the body including skin, joints, kidneys, lungs, nervous system, serous membranes, heart, vessels and blood. The exact cause of this disease is not known. A number of antibodies against the nuclear material are produced which is another prominent feature of this disease.[1] The clinical course of SLE is characterized by periods of healthy intervals and disease. The disease occurs more commonly in females then males.[2]

Patients can present with generalized symptoms like fever, weight loss, decreased appetite etc or symptoms specific to different organ systems of the body like joint pains and swelling, chest pain, abdominal pain and swelling, shortness of breath, urinary problems, neurological and psychiatric problem etc. SLE should also be suspected if patients have joint pains and atypical findings like enlarged liver, spleen or lymph nodes.[1,3] Sometimes positive Coomb's test, decreased titre of compliment factors especially C_1q, C_2 and C_4 can suggest the diagnosis. History of recurrent abortions can be a clue toward diagnosis.[2]

Most physicians use the American College of Rheumatology (ACR) criteria for research work purpose.[5]This criteria is not 100% specific to

make diagnosis rather it was made to classify patients as case of SLE when compared to other connective tissue diseases for study purpose. Overall it has sensitivity and specificity of 96%.[6,7]

Metabolic syndrome (MetS) is a collection of different risk factors for cardiovascular disease.[8] In general population, it is associated with higher incidence of cardiac disease and mortality. Patients with SLE are noted to have increased association with MetS.[9] Mortality in SLE is not due to disease itself but it is usually due to cardiovascular cause. It is assumed that MetS may be the cause of increased deaths in SLE patients.[10,11]

Many factors can lead to MetS in SLE. Use of steroids can cause insulin resistance and high blood pressure. Limitation of activity due to joint pains can lead to central obesity. However MetS can have different expression in SLE and may not present with central obesity always. Usually we rely on central obesity to consider MetS. But it is not a wise decision in SLE. Attention to individual CHD risk factors is recommended.[12,13]

OPERATIONAL DEFINITIONS

Metabolic Syndrome

Metabolic syndrome was defined according to the revised criteria of National Cholesterol Education Program Adult Treatment Panel III (NCEP) guidelines which define metabolic syndrome as being present if three or more of the following five criteria are fulfilled:

(1) Central obesity: waist ≥90 cm in Asian males and ≥80 cm in asian women

(2) Low HDL <40 mg/dl in men and <50 mg/dl in women

(3) High blood pressure: ≥130/85 mm Hg or use of drugs for high blood pressure

(4) High fasting glucose ≥100 mg/dl

(5) Serum triglyceride level ≥ 150 mg/dl

Systemic Lupus Erythematosus

Systemic lupus erythematosus (SLE) was defined according to the American College of Rheumatology Classification system for systemic lupus erythematosus which classify a person as a probable case of lupus if 4 or more of the 11 criteria are present. (see appendix #1)

Inclusion Criteria

Diagnosed patients of SLE including both male and females between 20-60 years of age (as per operational definitions)

Exclusion Criteria

Subjects with history of alcohol intake or use of such drugs which affect lipid profile, blood glucose level, blood pressure e.g. oral contraceptive pills, statins, beta blockers, thiazide diuretics were assessed on history and clinical examination.

Data Collection

A total of 78 patients fulfilling the inclusion criteria were enrolled in the study from the medical out-patient department of Jinnah hospital, after obtaining their written informed consent. Fasting blood glucose and Lipid profile was done in the hospital laboratory. It included total cholesterol, low density lipoproteins (LDL), very low density lipoproteins (VLDL) and high density lipoprotein (HDL) cholesterol. Metabolic syndrome was labeled as per operational definition. Data was recorded on a specially designed performa along with the demographic data.

Data Analysis

Data was entered and analyzed through SPSS version 17.0 and Microsoft excel version 2010. Quantitative data like age was presented by mean and standard deviation. Qualitative data like gender and metabolic syndrome was presented by frequency and percentages. Data was stratified for age, gender, family history of CHD, smoking. Regression analysis was used to assess the relationship of individual variables with MetS. Chi–square test was applied post-stratification with p-value ≤ 0.05 considered as significant.

RESULTS

Among 78 cases of systemic lupus erythematosus in the present research, we found that there were 3 (4%) male and 75 (96%) were female. The minimum age was found as 20 years and maximum age was 60 years with mean and

standard deviation 40.21±10.67 years. It was observed that there were 30 (38.5%) cases of SLE in which family history of CHD was found. In 78 cases of systemic lupus erythematosus, there were 26 (33.3%) patients who were smokers for more than two years. Central obesity was measured by waist (more than 102 cm waist in men and more than 88 cm waist in women). It was observed that there were 38 (48.7%) patients with central obesity. There were 37 (47.4%) patients in which high fasting blood glucose was found. There were 35 (44.9%) cases with low HDL and 31(39.7%) patients with high blood pressure. Metabolic syndrome was found in 26 (33.3%) patients of systemic lupus erythematosus. It was observed that metabolic syndrome was significantly associated with high blood pressure (p= 0.00), central obesity (p= 0.00), high blood glucose (p= 0.00), low HDL (p= 0.00). In patients of metabolic syndrome 58% patients were between 20-40 years and 42% patients were between 41-60 years of age. There were 11.5% males and 88.5% females of metabolic syndrome. Family history of CHD was present in 31% patients of MetS while 27% patients of MetS were smoker. It was observed that metabolic syndrome was significantly associated with high blood pressure (p= 0.00), central obesity (p= 0.00), high blood glucose (p= 0.00), low HDL (p= 0.00).and gender (p=0.01) but association with age (p=0.33), smoking (p=0.37) and family history of CHD (p=0.32) was not significant.

	Frequency	Percentage
Male	3	4%
Female	75	96%
Total	78	100.0

Table-I. Frequency and percentage of Gender (SLE)

Age	Male		Female	
	Frequency	%	Frequency	%
20-40	2	67	55	74
41-60	1	33	20	26

Table-II. Frequency and percentage of age (SLE)

	Frequency	Percentage
Yes	30	38.5%
No	48	61.5%
Total	78	100.0

Table-III. Frequency and percentage of Family History of CHD in SLE

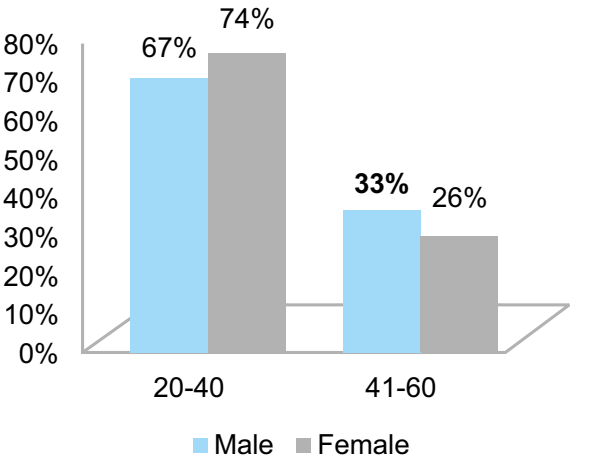


Figure-1. Age distribution in patients of SLE

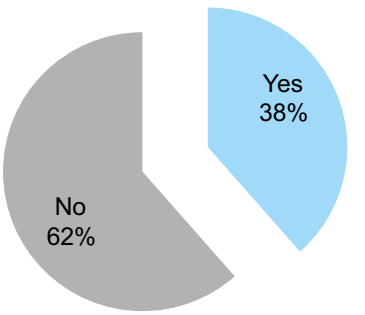


Figure-2. Percentage of patients with positive family history of CHD

	Frequency	Percentage
Yes	26	33.3%
No	52	66.7%
Total	78	100.0

Table-IV. Frequency and percentage of Smoking in SLE patients

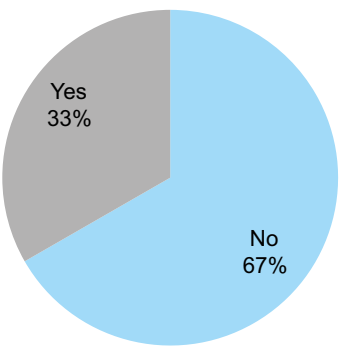


Figure-3. Percentage of smokers among SLE patients

	Frequency	Percentage	P Value
Yes	38	48.7%	0.00
No	40	51.3%	
Total	78	100.0%	

Table-V. Frequency and percentage of Central obesity (SLE)

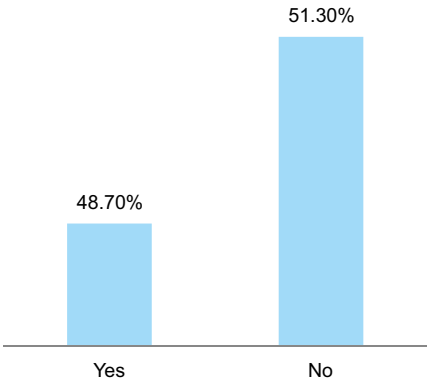


Figure-4. Percentage of patients with central obesity among SLE patients

	Frequency	Percentage	P value
Yes	37	47.4%	0.00
No	41	52.6 %	
Total	78	100.0%	

Table-VI. Frequency and percentage of High Fasting Blood Glucose (SLE)

	Frequency	Percentage	P Value
Yes	35	44.9 %	0.00
No	43	55.1 %	
Total	78	100.0%	

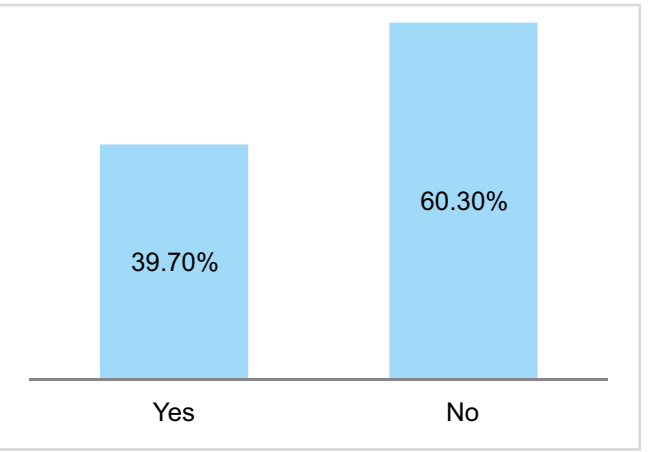
Table-VII. Frequency and percentage of Low HDL (SLE)

	Frequency	Percentage	P Value
Yes	31	39.7%	0.00
No	47	60.3%	
Total	78	100.0%	

Table-VIII. Frequency and percentage of High Blood Pressure (SLE)

	Frequency	Percentage
Yes	26	33.3%
No	52	66.7%
Total	78	100.0%

Table-IX. Frequency and percentage of Metabolic syndrome (SLE)



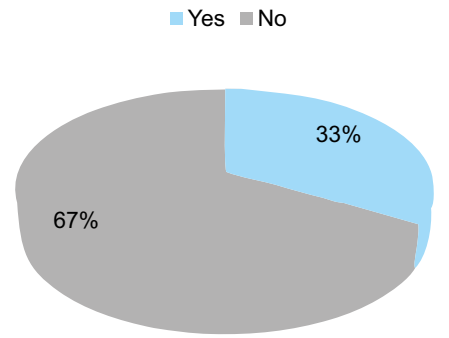


Figure-5. Percentage of patients with metabolic syndrome among SLE patients

Age	Metabolic syndrome		Total	P Value
	Yes	No		
20-40years	15 57.7%	24 46.2%	39 50%	0.337
41-60 years	11 42.3%	28 53.8%	78 100.0%	
Total	26 100.0%	52 100.0%	78 100.0%	

Table-X. Frequency and percentage of Age (Metabolic syndrome)

Gender	Metabolic syndrome		Total	P Value
	Yes	No		
Male	3 11.5%	0 .0%	3 3.8%	0.012
Female	23 88.5%	52 100.0%	75 96.2%	
Total	26 100.0%	52 100.0%	78 100.0%	

Table-XI. Distribution of Gender in patients of Metabolic syndrome

	Frequency	Percentage	P-value
Yes	7	27%	0.377
No	19	73%	
Total	26	100.0	

Table-XII. Frequency and percentage of Smoking in patients with metabolic syndrome

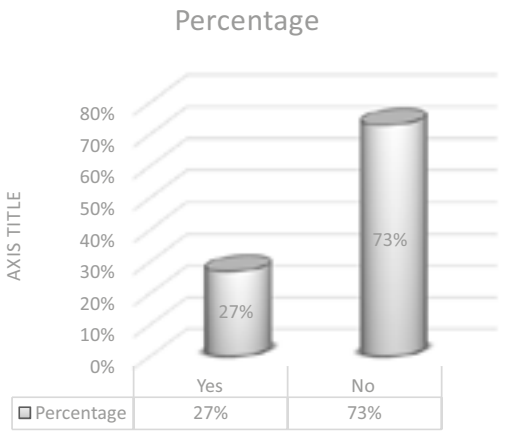


Figure-6. Percentage of smokers among patients with metabolic syndrome

	Frequency	Percentage	P-value
Yes	8	31%	0.323
No	18	69%	
Total	26	100.0	

Table-XIII. Frequency and percentage of family history of CHD in patients with metabolic syndrome

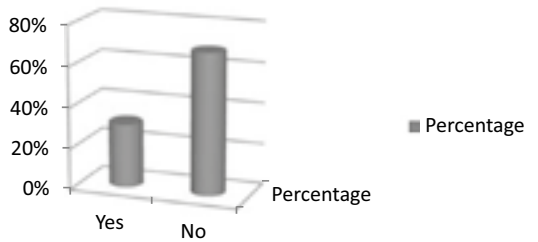


Figure-7. Percentage of patients with family history of CHD in metabolic syndrome

DISCUSSION

We enrolled 78 patients of SLE after fulfilling inclusion criteria. Males were 4% and females were common (96%). Young patients are more common than older ones. These findings are similar to earlier studies. Smoking history was positive in 33% patients. Some previous researches show different percentage (upto 68%). This is probably due to different social setup in our region than western setup.

Percentage of metabolic syndrome among SLE patients was almost similar to earlier data. In one of the previous studies, metabolic syndrome was present in 16.3% patients of SLE.[20] Another study showed that the frequency of MetS was 32.1%.[21] Yet another research showed the percentage of metabolic syndrome to be 28% in SLE patients.[22] Its most common component is central obesity. In our study, central obesity was seen in 48.7% of patients. It had significant association with MetS. Some previous researchers had different observation. They noted that MetS in SLE patients was more commonly associated with high blood pressure and low HDL levels. Obesity was relatively uncommon.[16,17] This difference in results might be due to the fact that sedentary lifestyle is more common in our people.

Association of MetS with smoking and family history of IHD was lower than observed in previous literature.

CONCLUSION

The frequency of metabolic syndrome in systemic lupus erythematosus patients presenting in a tertiary care hospital was found to be 33%. Metabolic syndrome was significantly associated with SLE.

REFERENCES

1. Von Feldt JM. **Systemic lupus erythematosus. Recognizing its various presentations.** Postgrad Med 1995; 97:79, 83, 86 passim.

2. Fessler BJ, Boumpas DT. **Severe major organ involvement in systemic lupus erythematosus.** Diagnosis and management. Rheum Dis Clin North Am 1995; 21:81.

3. Zhou WJ, Yang CD. **The causes and clinical significance of fever in systemic lupus erythematosus: a retrospective study of 487 hospitalized patients.** Lupus 2009; 18:807.

4. Jump RL, Robinson ME, Armstrong AE, et al. **Fatigue in systemic lupus erythematosus: contributions of disease activity, pain, depression, and perceived social support.** J Rheumatol 2005; 32:1699.

5. Sekigawa I, Yoshiike T, Iida N, et al. **Allergic diseases in systemic lupus erythematosus: prevalence and**

immunological considerations. Clin Exp Rheumatol 2003; 21:117.

6. Greco CM, Rudy TE, Manzi S. **Adaptation to chronic pain in systemic lupus erythematosus: applicability of the multidimensional pain inventory.** Pain Med 2003; 4:39.

7. Wolfe F, Petri M, Alarcón GS, et al. **Fibromyalgia, systemic lupus erythematosus (SLE), and evaluation of SLE activity.** J Rheumatol 2009; 36:82.

8. Telles R, Lanna C, Ferreira G, Ribeiro A. **Metabolic syndrome in patients with systemic lupus erythematosus: association with traditional risk factors for coronary heart disease and lupus characteristics.** Lupus. 2010; 19(7):803-9.

9. Parker B, Urowitz MB, Gladman DD, Lunt M, et al. **Clinical associations of the metabolic syndrome in systemic lupus erythematosus: data from an international inception cohort.** Annals of the rheumatic diseases, 2013; 72(8):1308-14.

10. Romero-Díaz J, García-Sosa I, Sánchez-Guerrero J. **Thrombosis in systemic lupus erythematosus and other autoimmune diseases of recent onset.** J Rheumatol 2009; 36:68.

11. Pyrpasopoulou A, Chatzimichailidou S, Aslanidis S. **Vascular Disease in Systemic Lupus Erythematosus.** Autoimmune Diseases 2012; 1-4.

12. Parker B, Ahmad Y, Shelmerdine J, Edlin H, Yates AP, et al. **An analysis of the metabolic syndrome phenotype in systemic lupus erythematosus.** Lupus, 2011; 20(14):1459-65.

13. Chakravarty EF, Bush TM, Manzi S, et al. **Prevalence of adult systemic lupus erythematosus in California and Pennsylvania in 2000: estimates obtained using hospitalization data.** Arthritis Rheum 2007; 56:2092.

14. V.K kawai,J F solus,A oeser, Y H rho, P raggi, A bian, T gebretsadik, A shinteni, C M stein. **Noval cardiovascular risk prediction models in patients with SLE.** Lupus, 2011; 20(14): 1526-34.

15. Mok CC, Poon WL, Lai JS, Wong CK. Et al. **Metabolic syndrome, endothelial injury, and subclinical atherosclerosis in patients with systemic lupus erythematosus.** Scandinavian journal of rheumatology, 2010; 39(1): 42-9.

16. Pereira RM, de carvalho JF, bonfa E. **Metabolic syndrome in rheumatological disease.** Autoimmune Rev, 2009; 8(5):415-9.

17. Bellomio V, Spindler A, Lucero E, Berman A, Sueldo R, et al. **SLE Study Group of the Argentinean Society of Rheumatology. Metabolic syndrome in Argentinean patients with systemic lupus erythematosus.** Lupus 2009; 11:1019-25.

18. Negron AM, Molina MJ, Mayor AM, Rodriguez VE, Vila LM. **Factors associated with metabolic syndrome in patients with systemic lupus erythematosus from Puerto Rico.** Lupus, 2008; 17(4):348-54.

19. I.E.M. Bultink, F. Turkstra, M. Diamant, B.A.C. Dijkmans1, A.E. Voskuyl. **Prevalence of and risk factors for the metabolic syndrome in women with systemic lupus erythematosus.** Clinical and Experimental Rheumatology 2008; 32-8.

20. Sabio JM, Zamora-pasadas M, Jimenez-jaimez J, et al. **Metabolic syndrome in patients with SLE from southern spain.** lupus, 2008;17(9):849-59.

21. Cecilia P Chung, Ingrid Avalos, Annette Oeser, Tebeb Gebretsadik, Ayumi Shintani, Paolo Raggi, and C Michael Stein. **High prevalence of the metabolic syndrome in patients with systemic lupus erythematosus: association with disease characteristics and cardiovascular risk factors.** Ann Rheum Dis. 2007; 2: 208–14.

22. Cederholm A, Svenungsson E, Ulfgren AK, et al. **Decrese binding of annexin v to endothelial cells: a potential mechanism in atherothrombosis of patients with SLE. Arterioscler.** Thromb. Vasc.Biol, 2005; 25(1):198-203.

AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Touseef Anwar	Drafting of manuscript critical revision, Data analysis	
3	Naveed ur Rehman	Plagiarism chekc and final approval	
4	Muhammad Badar Bashir	Co-author	