ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 09, Issue, 07, pp. 28949-28953, July, 2019

RESEARCH ARTICLE OPEN ACCESS

PATTERN OF METABOLIC SYNDROME AMONG SYSTEMIC LUPUS ERYTHEMATOSUS PATIENTS ATTENDING IN A TERTIARY CARE HOSPITAL

[1]Amanat Ullah, *[1]Milton Barua, [1]Anupam Barua, [1]Jahangir Alam, [1]Mofizul Islam, [1]Ruhul Quddus, [1]Labeeba faria and [1]Zulfiquar Seraj

[1]MBBS, FCPS, MCPS, MRCP; AR, Dept. of Endocrinology, CMCH
[2]MBBS, FCPS, MD; Dept. of Endocrinology, BIRDEM

ARTICLE INFO

Article History:
Received 09th April, 2019
Received in revised form
20th May, 2019
Accepted 19th June, 2019
Published online 31st July, 2019

Key Words:
Increased waist circumference,
Private Laboratory,
Among the patients.

ABSTRACT

Systemic Lupus Erythematosus (SLE) patients having metabolic syndrome (MS) are at increased risk of future cardiovascular disease. This cross-sectional study is done for one year to find out the different patterns of metabolic syndrome among SLE patients, were evaluated according to the case record form with particular reference to patterns of metabolic syndrome. All investigations were done in the Biochemistry Department of CMCH and also in some recognized Private Laboratory if those are not available at CMCH. Among all 40 patients 7(17.5%) patients were having metabolic syndrome, 15 patients (37.5%) were suffering from Hypertension, 9 patients (22.5%) had increased waist circumference, 1 (2.5%) patient had diabetes, 11 (27.5%) patients had low HDL & 16 patients (40%) had raised triglyceride Level. Among the patients with metabolic syndrome, all of them (100%) had hypertension, 3 (42.8%) had increased waist circumference, 1(2.5%) patient had diabetes, 4(57.1%) patients had low HDL and 6(85.7%) patients had high triglyceride level. The study showed that 15(37.5%) patients were hypertensive and one (2.5%) patient was diabetic. All patients were on steroids, half (50%) of the patients were taking Hydroxychloroquine, 11(27.5%) patients were on prednisolone, 11(27.5%) were on both Prednisolone and Hydroxychloroquine, only 1(2.5%) patient was taking MycophenolateMofetil. Ultimately hypertension and high triglyceride were the most common component of Metabolic Syndrome found SLE patients. Chronic Steroid use is a predisposing factor for developing metabolic syndrome.

Citation: Amanat Ullah, Milton Barua, Anupam Barua *et al.* 2019. "Pattern of metabolic syndrome among systemic lupus erythematosus patients attending in a tertiary care hospital", *International Journal of Development Research*, 09, (07), 28949-28953.

INTRODUCTION

Systemic Lupus Erythematosus (SLE) is a multisystem autoimmune disease that predominantly affects women of childbearing age. It is also a major cause of mortality and morbidity in young populations (James, 2005 and Rahman, 2008). The prevalence of SLE varies throughout the world. In the western world, it is about 40 per 100000 populations. There appear to be a higher incidence in blacks and Hispanics than in other population. Over 80 percent of cases occur in women during their childbearing age (Hemminki, 2009 and Isenberg, 2001). Metabolic syndrome (MetS) is a combination of factors that multiply a person's risk for heart disease, diabetes, and stroke.

***Corresponding author: Milton Barua,**
MBBS, FCPS, MCPS, MRCP; AR, Dept. of Endocrinology, CMCH

It was defined according to the 2009 joint interim statement from the: International Diabetes Federation Task Force on Epidemiology and Prevention; National Heart, Lung, and Blood Institute; American Heart Association; World Heart Federation; International Atherosclerosis Society; and the International Association for the Study of Obesity. This definition requires the presence of at least three of the following criteria: a) elevated waist circumference using population/country-specific thresholds; b) elevated triglycerides (fats in the blood; > 150 mg/dl) or a regimen of drug therapy to treat it; c) reduced high-density lipoprotein (HDL) cholesterol (< 50 mg/dl); elevated blood pressure (130/85 mm Hg or greater) or a regimen of drug therapy to treat it; and d) elevated fasting glucose (> 100 mg/dl) or a regimen of drug therapy to treat it. Metabolic Syndrome is associated with accelerated risk of atherosclerosis and therefore the risk of coronary and cerebrovascular disease is

high among these patients. The excess risk of coronary heart disease in SLE is well recognized and there is also an increased risk of cerebrovascular disease (Manzi, 1997). It is also established that accelerated atherosclerosis is the key driver of this excess mortality and morbidity (6). Patients with lupus are at increased risk of metabolic syndrome and thus at increased risk of cardiovascular disease (6). Therefore, these patients are in need of more comprehensive cardiovascular disease screening. A number of large cohort studies have been established to examine risk factors for CVD in SLE patients (Isenberg, 2001). Bessant et al. estimated 10-year risk of CHD and stroke events in a large prospective SLE cohort. The mean (SD) estimated 10-year risk for CHD and stroke were 1.4% (0.2%–3.4%) and 0.6% (0.4%–1.3%), respectively. Over 10 years of follow-up, 8.5% actually had a CHD event and 10.8% had a stroke, demonstrating an approximate six-fold and 18-fold underestimate of CHD and stroke risk, respectively. This and other studies support the view that classic risk factors alone, whilst more common in SLE, do not fully explain the higher CVD risk in this population. They also suggest that SLE can be considered as an 'independent' CHD risk factor (Björnådal, 2004). A study was done by Ford et al. found in an age-adjusted analysis that increased waist circumference was more frequent in SLE patients (odds ratio (OR) (95% CI) 1.3 (0.8, 2.2)) (Ford, 2004).

They noted a statistically significant higher waist circumference (WC) in lupus patients compared to controls (Park, 2008). They also found that higher corticosteroid doses, Korean and Hispanic ethnicity, chronic inflammation are associated with MetS in SLE patients. Parker et al studied 1484 patients, in which most were women (89%) and about 35 years of age and who had lupus for about 18 months. About 44% of the participants were Caucasian, 16% were Hispanic, 15% were African-American or Afro-Caribbean, and 20% were Southeast Asian. The participants had, on average, moderate lupus disease activity, but about 20% had severe lupus disease activity. Metabolic syndrome was present in 16% of the patients studied and was significantly more common in men (22.2%) than in women (15.2%). Lupus patients having metabolic syndrome were more likely to be an older age group and more prevalent in Hispanic or Korean ethnicity than those without it (16). A large study from Mexico in 2006 found an overall prevalence of MetS in adults >20 years of 37%–50%, depending on the definition used (Rojas, 2010) and 24%–36% in adults aged 20–39 years(8). Similarly, the San Antonio Heart Study demonstrated that people of Mexican Hispanic descent had a higher prevalence of MetS than Caucasians, an observation especially pronounced in women (30.9% vs 16.8%) (Lorenzo, 2007). A recent study of South Korean adults described a variable MetS prevalence in women of 16%–31%, depending on the definition used (Park, 2008). The majority of studies to date have used the NCEP ATP III definition, while more recent studies have also included the 2009 IDF harmonized criteria. The absolute estimate of prevalence has varied across different studies from 18% to 30%; however, in studies with a control group the prevalence of MetS has been shown to be higher than in the general population (13). Among the components of metabolic syndrome, increased blood pressure is the most commonly noted in SLE patients and is more common in SLE than in controls. Interestingly, central adiposity is less consistently over-represented in SLE patients (15). Sabio et al. compared the mean body mass index (BMI) between SLE patients and controls and found that controls had increased waist circumference rates (Chung, 2007). By analyzing all these studies, it is found that no single disease-specific factor predispose patients with SLE to develop MetS. Lupus-related factors significantly associated with the metabolic syndrome included: severe lupus disease activity (10 or greater on the SLEDAI-2K), current oral or past intravenous steroid treatment, and current immunosuppressive treatment (13). Additional analyses revealed that factors independently associated with increased risk of metabolic syndrome included: increased oral daily dose of prednisone, older age at study entry, being of Korean or Hispanic ethnicity and current treatment with immunosuppressive drugs (12,13). A number of studies have, however, suggested that higher levels of inflammatory disease activity and previous disease-related damage contribute to the risk of developing Metabolic Syndrome (Parker, 2011). This study is done to find out the different pattern of metabolic syndrome among SLE patients because identifying the patterns of Metabolic Syndrome has enormous importance in these patients (17). SLE patients having Metabolic syndrome are at increased risk of future CVD (11). As such its presence should alert physicians to individuals in whom more focused attention should be paid to the primary preventive measures for CHD(12). Therefore these patients are in need of more comprehensive cardiovascular disease screening (Alberti, 2006).

MATERIALS AND METHODS

It was a hospital-based Observational study. done on the patients who had been admitted in the Departments of Medicine, of Chittagong Medical College Hospital (CMCH), Chittagong during a period of 1 Year (January 2015 to December 2015). As the overall prevalence of metabolic syndrome in SLE patient is around 18% to 30%. So sample size was calculated by the following a formula, which was 80.07 but for the time constraint, a total of 40 cases of SLE was taken as study sample by purposive or judgment sampling technique. All patients admitted in the Department of Medicine wards were included which were consistent with ARA (American Rheumatology Association) criteria for systemic lupus erythematosus. Diagnosed case of SLE, age more than 18 years, both female and male and patients who provided written informed consent to participate in the study were included in the study and SLE with pregnancy, patients who need ICU support were excluded. The subjects were thoroughly informed about the aims, objectives and detail procedure of the study before examination. Informed written consent was taken from the entire participant who was selected for the study. She/he was encouraged for voluntary participation and allowed freedom to withdraw from the study whenever she liked even after participation. Data was included a detailed history, clinical examination, and investigations with particular references to the different components of metabolic syndrome. For different blood tests 10cc venous blood was collected by a trained laboratory technologist and peripheral blood film also was produced in the spot to avoid technical error. Fifty adult patients were included in this study.

RESULTS

Table 1 showing gender distribution of the study patients where 39(97.5%) were female. Only one patient was male. Table also shows age group distribution where <20 years were 7(17.5%), 21-30 years were 20(50.0%), 31-40 years were 10(25%) and 41-50 years were 3(7.5%).

Table 1. Gender & Age Group Distribution of the patients

Age	Frequency	Percent	Male	Percent	Female	Percent
<20 years	7	17.5			14	35
21-30 years	20	50.0	1	2.5	20	50
31-40 years	10	25.0			5	12.5
41-50 years	3	7.5			0	0
Total	40	100.0	1	2.5	39	97.5

Table 2. Drug Treatment for SLE

Drug	Frequency	Percent
Prednisolone	11	27.5
Hydroxychloroquine	20	50
Prednisolone + Hydroxychloroquine	11	27.5
Other drugs : MycophenolateMofetil	1	2.5

Table 3. Frequency of different component of Metabolic Syndrome in Study Subjects

Components of Metabolic Syndrome	Frequency	Percent
Hypertension	15	37.5
Waist Circumference	9	22.5
Fasting Blood Sugar	1	2.5
High Density Lipoprotein	11	27.5
Triglyceride	16	40

Table 4. Frequency of different components among Metabolic Syndrome Patients

Component	Frequency	Percent
Hypertension	7	100
Waist Circumference	3	42.8
Fasting Blood Sugar	1	14.2
Low High Density Lipoprotein	4	57.1
High Triglyceride	6	85.71

Table 5. Presence of Metabolic Syndrome among Steroid & Non Steroid groups

	Frequency of Metabolic Syndrome	Percent
Patients on Steroid	7	100
Patients not taking steroid	0	0

Table 2 showing half (50%) were on drug treatment for SLE mainly Hydroxycloroquine. It also shows use of steroids where 11(27.5%) patients were on prednisolone, 11(27.5%) were on both Prednisolone and Hydroxychloroquine. 1(2.5%) patient is taking MycophenolateMofetil. Table 3 showing 15 patients (37.5%) were suffering from Hypertension, 9 patients (22.5%) has increased waist circumference, 1 (2.5%) patient has diabetes, 11 (27.5%) patients has high HDL & 16 patients (40%) has raised Triglyceride Level. Table 4 showing among the 7 patients suffering from metabolic syndrome, all of them (100%) have hypertension, 3(42.8%) patients have increased waist circumference, 1(2.5%) patient has diabetes, 4(57.1%) patients have high HDL and 6(85.7%) patients have high Triglyceride level. Table 5 shows that, all the 7 patients having Metabolic Syndrome are on Steroid (100%).

DISCUSSION

This study was conducted at Chittagong Medical College Hospital among 40 diagnosed SLE patients to see the pattern of Metabolic Syndrome. Among all 40 patients, 7(17.5%) patients were having metabolic syndrome. So, there is a high prevalence of metabolic syndrome in SLE patients in our country. In a study, it was found that in an age-adjusted analysis, SLE patients were more likely to have MetS (OR 2.1 (95% CI 1.1, 3.8)). This increased risk was not primarily attributable to increased central obesity (OR 1.3 (0.8, 2.2) but was mainly driven by an increased prevalence of hypertension (OR 3.4 (1.9–6.0) low high-density lipoprotein (HDL) cholesterol (OR 2.2 (1.3–4.0) and high triglycerides (OR 1.9 (1.02–3.5). Different worldwide studies showed the prevalence of Metabolic Syndrome between 16% to 17%, which is almost consistent with our study (15, 16). We also studied the frequency of different component of Metabolic Syndrome among the study subjects. It reveals that high Triglyceride is the most common component of metabolic syndrome found among 40 patients of SLE and hypertension is the second most common. 15 patients (37.5%) were suffering from Hypertension, 9 patients (22.5%) had increased waist circumference, 1 (2.5%) patient had diabetes, 11 (27.5%) patients had low HDL & 16 patients (40%) had raised Triglyceride Level. The frequency of different components among Metabolic Syndrome patients was also studied. Among the 7 patients suffering from metabolic syndrome, all of them (100%) had hypertension, 3(42.8%) patients had increased waist circumference, 1(2.5%) patient had diabetes, 4(57.1%) patients had low HDL and 6(85.7%) patients had high Triglyceride level. So, we found that hypertension is the most common component among SLE patients having metabolic syndrome. The relation between steroid use and metabolic syndrome were also explored. It is found that the prevalence of metabolic syndrome and chronic steroid use is closely linked. All the 7 patients having Metabolic Syndrome in our study were on Steroid (100%). Regarding gender distribution of the

study patients, 39(97.5%) were female. Only one patient was male. So there is female preponderance in the studied patients. This is an expected result as most of the studies show a similar result. Cameron et al (Cameron, 1999) has reported a male to female ratio of 1:8 to 1: 14 in a series of adult patients. Regarding age grouping of the study patients, <20 years were 7(17.5%), 21-30 years were 20(50.0%), 31-40 years were 10(25%) and 41-50 years were 3(7.5%). SLE is a disease of childbearing age (Manzi, 2003). The median age of onset of SLE is 24.years in a series reported by Malaviya AN (Malaviya, 1988). It is also found in the study that, 15(37.5%) patients were hypertensive and one (2.5%) patient was diabetic and who was also on antidiabetic drugs. All the hypertensive patients were taking different antihypertensive drugs such as Losartan Potassium, Ramipril, Amlodipine, Prazocin etc. Analyzing drug treatment in these patients it is found that, most of the patients were taking either Hydroxychloroquine or prednisolone or both. Half (50%) of the patients were taking Hydroxychloroquine. 11(27.5%) patients were on prednisolone, 11(27.5%) were on both Prednisolone and Hydroxychloroquine. 1(2.5%) patient was taking Mycophenolate Mofetil. We have found that Hydroxychloroquine is the most commonly used drug among these 40 SLE patients. The results of the present study demonstrate a high prevalence of the metabolic syndrome in women with SLE, a disease characterized by chronic inflammation, accelerated atherosclerosis and premature cardiovascular disease. Hypertension and dyslipidemia, not obesity, were recognized as the most frequent components of the metabolic syndrome in this patient population. Besides traditional cardiovascular risk factors, such as age, we were able to identify SLE related and treatment-related factors associated with high MetS score. Based on these findings, subgroups of female lupus patients may be identified that are at disproportional high risk of developing cardiovascular disease and diabetes mellitus, with possible therapeutic consequences.

Conclusion

This was an observational cross-sectional study to find out the pattern of metabolic syndrome among 40 diagnosed cases of SLE patients. Most patients were female of childbearing age. Seven (17.5%) patients had metabolic syndrome. Hypertension and High Triglyceride were the most common component of Metabolic Syndrome found in these patients. Chronic Steroid use is also a predisposing factor for developing metabolic syndrome.

REFERENCES

Abu-Shakra M, Urowitz MB, Gladman DD, Gough J. 1995. Mortality studies in systemic lupus erythematosus. Results from a single center. I. Causes of death. *J Rheumatol* 22: 1259–1264.

Alberti KG, Zimmet P, Shaw J. 2006. Metabolic syndrome – a new world-wide definition. A Consensus Statement from the International Diabetes Federation. *Diabet Med*, 23: 469–480

Bernatsky, S., Boivin, J.F., Joseph, L., 2006. Mortality in systemic lupus erythematosus. *Arthritis Rheum*, 54: 2550–2557.

Björnådal, L., Yin, L., Granath, F., Klareskog, L., Ekbom, A. 2004. Cardiovascular disease a hazard despite improved prognosis in patients with systemic lupus erythematosus: Results from a Swedish population based study 1964–95. *J Rheumatol.,* 31: 713–719.

Bloomgarden, Z.T. 2003. American Association of Clinical End ocrinologists (AACE) consensus conference on the insulin resistance syndrome. *Diabetes Care*., 26: 1297–1303

Budman, D.R. and Steinberg, A.D. 1977. Hematologic aspects os systemic lupus erythematosus. *Current concepts.* Ann Int Med., 86: 220-229

Cameron, S.J., Bank, E., Melmerby. 1999. Lupus Nephritis. Disease of the month. *J Am SocNephrol,* 10: 413-422.

Chung CP, Avalos I, Oeser A. 2007. High prevalence of the metabolic syndrome in patients with systemic lupus erythematosus: Association with disease characteristics and cardiovascular risk factors. *Ann Rheum Dis*., 66: 208–214.

Edworthy, S.M., Zatarain, E., McShane, D.J., Bloch, D.A. 1982. "Analysis of the 1982 ARA lupus criteria data set by recursive partitioning methodology: new insights into the relative merit of individual criteria". *J. Rheumatol.,* 15 (10): 1493–8

Expert panel on Detection Evaluation, and Treatment of High Blood Cholesterol in adults. Executive summary of the third report of the National Cholesterol Education Program (NECP). *JAMA* 2001;285:2486-79

Ford, E.S., Giles, W.H., Mokdad, A.H. 2004. Increasing prevalence of the metabolic syndrome among U.S. adults. Diabetes Care., 27: 2444–2449.

Hemminki, K., Li, X., Sundquist, J., Sundquist, K. 2009. "Familial associations of rheumatoid arthritis with autoimmune diseases and related conditions". *Arthritis Rheum.,* 60 (3): 661–668.

Hux, M., Fan, Z.R., Zhou, S.Y. 2004. Hematological abnormality and clinical aharacteristics in systemic lupus erythematosus. Zhongguoshi Yan. Apri;12(2):170-3

Isenberg, D.A., Gladman, D. 2001. The Systemic Lupus International Collaborating Clinics Group – origins and outcomes. *Lupus.,* 10: 375–377.

James, William; Berger, Timothy; Elston, Dirk. Andrews' Diseases of the Skin: Clinical Dermatology. 10th ed. Saunders. 2005. p 345-456

Kumar A. Indian guideline on the management of SLE. Indian RheumatologicalmAssoc 2002, 10: 80-96

Levin JS, Fritzler and Keith Elkon. Autoantibodies in SLE, In rheumatology, 3rd ed. M.C. Hochberg, AJ Silman(eds) Philadelphia:Mosby 2003: 1337-1346.

Lorenzo C, Williams K, Hunt KJ, Haffner SM. The National Cholesterol Education Program – Adult Treatment Panel III, International Diabetes Federation, and World Health Organization definitions of the metabolic syndrome as predictors of incident cardiovascular disease and diabetes. Diabetes Care 2007; 30: 8–13.

Malaviya AN, SinghRR, KumarA. Systemic lupus erythematosus in Northern India. A review of 329 cases. J Assoc. Physicians India.1988; 36: 473-75

Manzi M, Ramsay- Goldman, Star KV, Epidemiology of systemic lupus erythematosus. In Rheumatology, 3rd edition, philadaelphia: Mosby,2003:1295-1296

Manzi S, Meilahn EN, Rairie JE Age-specific incidence rates of myocardial infarction and angina in women with systemic lupus erythematosus: Comparison with the Framingham Study. Am J Epidemiol 1997; 145: 408–415.

Mary K. Crow (February 28, 2008). "Collaboration, Genetic Associations, and Lupus Erythematosus". *N Engl J Med*358 (9): 956–961.

Masters, K. 2009. "Lupus And Lipstick: The Industry Responds". *The Internet Journal of Dermatology*7 (1).123-130.

Miguel EC, Rodrigues Pereira RM, Debraganca Pereira CA. Psychiatric menefestations of systemic lupus erythematosus: Clinical features, symptoms and signs of central nervous system activity in 43 patients. Medicine1994;73:224-232

Park HS, Park CY, Oh SW, Yoo HJ. . Prevalence of obesity and metabolic syndrome in Korean adults. Obes Rev 2008; 9: 104–107.

Parker B, Ahmad Y, Shelmerdine J,. An analysis of the metabolic syndrome phenotype in systemic lupus erythematosus. Lupus 2011; 20: 1459–1465.

Rahman A, David A. Isenberg. "Review Article: Systemic Lupus Erythematosus". *N Engl J Med*, 2008; 358 (9): 929–939.

Rojas R, Aguilar-Salinas CA, Jiménez-Corona A,. Metabolic syndrome in Mexican adults: Results from the National Health and Nutrition Survey 2006. SaludPublicaMex 2010; 52(Suppl 1): S11–S18.

Sabio JM, Zamora-Pasadas M, Jiménez-Jáimez J, . Metabolic syndrome in patients with systemic lupus erythematosus from Southern Spain. Lupus 2008; 17: 849–859.

Voulgarelis M, Kokori SIG, Ioannidis JPA. Anemia in systemic lupus erythematosus: etiological profile and the role of erytropoetin . Ann Rheum Dis 2000;59: 217-222

Wallace DJ, The clinical presentations of SLE, In Dubois' Lupus erythematosus 4thed Chapter 33, Wallace DJ and Hahn BH(eds) Philadelphia, Lea and Febiger 1993: 317-321.

****