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Metabolic Syndrome Associated Arthropathy

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ABSTRACT

Metabolic syndrome is a global health problem identified in large scale of population worldwide with many complications. Arthropathy also is a great health problem that can add burden on patients with metabolic syndrome. Our issue was to evaluate the most commonly type of arthropathy in association with metabolic syndrome. We collected 90 Egyptian patients of arthropathy from internal medicine clinic at New Kasr El-Aini Hospital during the period from December 2013 to June 2014. All the patients were evaluated carefully by complete history taking, full clinical examination and full laboratory investigations. According to the types of arthropathy found in our patients they were classified into 3 groups: osteoarthritis, gouty arthritis and rheumatoid arthritis. The results obtained from our patients were tabulated and statistically analyzed. Our results concluded that osteoarthritis was the most common type of arthropathy found in association with metabolic syndrome suggesting that control of components of metabolic syndrome can reduce the chance of developing osteoarthritis in metabolic syndrome patients.

Key words : Metabolic syndrome – Arthropathy - Egyptian

INTRODUCTION

Metabolic syndrome (Met S) describes a combination of multiple cardiovascular risk factors as dyslipidemia, central obesity, a disturbance of glucose/insulin metabolism and hypertension (Reilly and Rader, 2003). In 2001, the National Cholesterol Education ProgramAdult Treatment Panel III (NCEP/ATPIII) published a clinical description of metabolic syndrome, defining it as the presentation of three or more of the following factors:

- ➢ Abdominal obesity, characterized as waist circumference >102 cm (for men) or >88 cm (for women)
- ➢ triglyceride level ≥150 mg/dL
- ➢ HDL cholesterol level <40 mg/dL (for men) and <50 mg/dL (for women)
- ➢ arterial blood pressure ≥130/85 mm Hg
- ➢ fasting glycemia ≥110 mg/dL (NCEP-ATP III, 2002)

Arthropathy is a broad term that includes a group of diseases affecting joints: Osteoarthritis (OA), gout, immuno/inflammatory arthritis and many other arthropathies can be included under that definition (Karvounaris et al., 2006). A proinflammatory cytokines such as interleukins (IL 6, IL 1, IL 8, IL 18), tumour necrosis factor alpha (TNF α) and adipokines capable of promoting synovial inflammation (Velasquez and Katz, 2010). Thus, our issue was to expert the distribution of different types of arthropathy that can be more frequently discovered in metabolic syndrome patients.

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PATIENTS AND METHODS

Patients:

In this study, 90 Egyptian patients of metabolic syndrome suffering from joint disease were included. All subjects attended the internal medicine clinic, New Kasr El-Aini Hospital during the period from December 2013 to June 2014. Written consent of agreement in participation in this study was obtained from all subjects.

Methods:

All patients enrolled in the current study were subjected to full history taking, complete clinical examination, full laboratory investigatins and radiological assessment of the affected joints. According to the different types of arthropathy associated with metabolic syndrome the patients were classified and all the data collected from patients were tabulated and statistically analyzed.

RESULTS

The data collected from the 90 patients of metabolic syndrome and arthropathy revealed that there were 3 groups according to the type of arthropathy associated with metabolic syndrome:

Group (A): included 48 patients suffering from Osteoarthritis.

Group (B): included 33 patients suffering from gouty arthritis.

Group (C): included 9 patients suffering from rheumatoid arthritis.

All the data collected from the patients were tabulated and statistically analyzed using Statistical Program for Social Science (SPSS) version 18.0. Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

The mean for age and sex of patients was shown in table (1) where no statistical significant difference found between the 3 groups of patients. Anthropometric measurements of the patients showed that the weight and Body Mass Index (BMI) were significantly higher in osteoarthritis patients when compared to gout or rheumatoid patients as shown in table (2). The clinical data of patients showed that patients of rheumatoid arthritis showed more severely affection of joints than the other groups as shown in table (3). Laboratory investigations of serum samples collected from patients were shown in tables (4), (5) and (6).

DISCUSSION

As regard comparison between patients of metabolic syndrome for age and sex distribution found in the three groups: osteoarthritis, gout and rheumatoid arthritis; the three groups were matched for age and sex with no statistically significant difference observed between the three subgroups. Our results revealed that anthropometric measurements were significantly correlated with osteoarthritis in comparison to gouty or rheumatoid arthritis. Weight, waist circumference (WC) and BMI; were significantly higher in osteoarthritis patients with metabolic syndrome when compared to gouty or rheumatoid arthritis patients.

The most frequently associated type of arthropathy revealed to be in common association with metabolic syndrome was osteoarthritis then gouty arthritis; while immune-inflammatory rheumatoid arthritis was the least in association with metabolic syndrome.

Obesity is the main preventable risk factor that has been identified in osteoarthritis. Longitudinal data

Table-1. Comparison between sub-groups as regard demographic data

Demographic Data	Group (A)	Group (B)	Group (C)	x2/F*	p-value
Sex - No. (%)					
Male	21 (43.75%)	24 (72.73%)	3 (33.33%)	2.735	0.255
Female	27 (56.25%)	9 (27.27%)	6 (66.67%)		
Age (years)					
Mean±SD	57.5±7.12	49.45±3.14	53.3±2.26	2.591	0.095

Table-2. Comparison between groups as regard anthropometric measurement

Anthropometric measurement	Group (A)		Group (B)		Group (C)		ANOVA test	
	Mean	±SD	Mean	±SD	Mean	±SD	F	p-value
Weight	95.69	16.12	91.73	4.05	83.47	3.52	2.342	**0.038**
Height	168.44	5.78	166.73	7.36	160.87	6.74	1.744	0.194
WC	125.91	13.55	120.88	2.66	115.63	4.88	1.451	0.252
BMI [wt/(ht)^2]	34.91	6.65	33.09	2.20	31.29	1.34	2.168	**0.049**

Table-3. Comparison between groups as regard data obtained by clinical examination

Clinical examination	Group (A)		Group (B)		Group (C)		ANOVA test	
	Mean	±SD	Mean	±SD	Mean	±SD	F	p-value
Systolic	158.13	9.11	165.91	11.14	145.80	6.14	5.502	**0.010**
Diastolic	102.19	6.05	100.36	4.59	90.47	3.82	5.944	**0.007**
No. of Swollen Joints	4	2	5	2	8	1	10.584	**<0.001**
No. of Tender Joints	4	1	6	1	9	1	26.436	**<0.001**
No. of Joints with Erosions	2	2	2	0	5	1	11.162	**<0.001**

Table-4. Comparison between groups as regard laboratory data

Laboratory data	Group (A)		Group (B)		Group (C)		ANOVA test	
	Mean	±SD	Mean	±SD	Mean	±SD	F	p-value
Glucose fasting	221.63	30.28	185.82	37.30	150.80	6.34	8.22	**0.002**
Glucose 2 hours	366.25	37.04	276.36	52.01	241.27	10.16	20.81	**<0.001**
HbA1c	10.09	1.04	7.95	0.65	8.07	0.40	7.28	**0.003**
Creatinine	0.94	0.15	1.06	0.14	1.33	0.06	11.23	**<0.001**
Uric acid	3.94	0.90	8.95	0.65	6.53	0.25	135.81	**<0.001**
T. bilrubin	0.99	0.11	0.90	0.08	0.40	0.00	52.42	**<0.001**
D. bilirubin	0.20	0.08	0.15	0.05	0.30	0.00	6.34	**0.006**
AST (SGOT)	20.63	3.05	14.82	0.87	19.13	0.81	20.14	**<0.001**
ALT (SGPT)	21.00	4.23	14.09	1.30	22.13	0.91	16.64	**<0.001**
ALP	37.63	2.96	37.55	2.38	50.27	2.11	29.66	**<0.001**
TG	258.1	47.09	173.5	28.22	180.97	7.60	15.91	**<0.001**
T.Cholesterol	290.00	27.57	259.09	9.54	279.47	11.77	6.69	**0.004**
HDL	38.0	3.94	42.55	3.59	38.20	1.61	4.63	**0.019**
LDL	166.69	13.09	163.36	8.24	145.80	6.14	4.14	**0.027**
Haemoglobin	12.34	0.75	13.82	0.87	12.07	0.50	13.29	**<0.001**
ESR 1st hour	51.75	9.19	34.36	3.75	68.67	3.51	33.23	**<0.001**
ESR 2nd hours	83.44	14.46	57.09	6.06	110.00	5.00	31.45	**<0.001**

Table-5. Comparison between groups as regard rheumatoid factor

Rheumatoid factor	Group (A)		Group (B)		Group (C)		Chi-square test	
	No.	%	No.	%	No.	%	x2	p-value
Positive	0	0.0	0	0.0	2	66.7	19.286	**<0.001**
Negative	16	100.0	11	100.0	1	33.3		
Total	16	100.0	11	100.0	3	100.0		

Table-6. Comparison between groups as regard C-reactive protein

	Group (A)		Group (B)		Group (C)		ANOVA test	
	Mean	±SD	Mean	±SD	Mean	±SD	F	p-value
C reactive protein	13.00	2.39	6.09	2.55	18.10	0.75	42.64	**<0.001**

have shown that obesity or overweight is a powerful risk factor for the development of osteoarthritis. In addition, obesity is also a risk factor for the progression of radiological OA (Cooper, et al, 2000).

Clinically, the results of the present study revealed that the group of patients with MS and rheumatoid arthritis were significantly more frequently have joints affected regarding number of swollen joints, number of tender joints and number of joints with erosions.

Our results found association between raised blood glucose level and osteoarthritis when compared to gouty arthritis or rheumatoid arthtritis. Hart, et al, (1995) found that raised fasting blood

glucose is significantly associated with osteoarthritis independent of obesity and supported the concept that osteoarthritis has an important systemic and metabolic component in its etiology. In addition, Dahaghin, et al, (2007) have found that the prevalence of hand OA is higher in younger people with diabetes and that the presence of overweight with diabetes and hypertension has an additive influence on hand OA, and supported the suggestion that OA has a metabolic component in its etiology.

CONCLUSION

Metabolic syndrome patients complicated with arthropathy were found commonly in association with osteoarthritis. We concluded that the prophylactic measures against development of osteoarthritis can be of great importance in metabolic syndrome patients.

Conflict of Interests:

The authors declare that there is no conflict of interests regarding the publication of this paper.

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