

Quality of life and urinary disorders in metabolic syndrome

Diagne N. S.^{1,4,*}, Nait Khachat A.¹, Azanmasso H.^{1,3}, Tchonda E.¹, Belhai K.¹, Tahiri A.², Lmidmani F.¹, Diop A. G.⁴, Ndiaye M M⁴, El Fatimi A.¹

¹Department of Physical Medicine and Rehabilitation, Ibn Rochd, Casablanca, Morocco

²Department of Endocrinology, Ibn Rochd, Casablanca, Morocco

³Department of Lions Club's "Insulin bank" of Cotonou, Benin

⁴Department of Neurology, Fann, Dakar, Senegal

Email address:

ngorsidediagne@yahoo.fr (Diagne N. S.)

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Abstract: Introduction: Risk factors of urinary disorders in metabolic syndrome are known. Effect of their association is poorly documented. Objectives: Determine the types of metabolic syndrome as a largest provider of urinary disorders and impact of these on the quality of life. Methodology: We conducted a cross-sectional, descriptive, analytical multicenter study from January to May 2013. It was done in three centers: the departments of Physical Medicine and endocrinology of university hospital Ibn Rochd of Casablanca and the Lions Club's "Insulin bank" of Cotonou, Benin. All patients with metabolic syndrome were included. Metabolic syndrome was diagnosed for NCEP ATP III criteria. Variables such as demographic characteristics, metabolic syndrome, glycemia, triglyceridemia and HDL cholestrolemia were noted. Evaluation of Urinary disorder was conducted by Urinary Symptoms Profile scale (USP). Urinary Symptoms Profile scale has ten items. It accesses urinary incontinence, urge incontinence and dysuria. Evaluation of quality of life was conducted by SF Qualiveen Scale. SF Qualiveen evaluates bother with limitations, fears, feeling and frequency of limitations. Results: we included 68 patients. Women represented 82.2%. The mean of age was 54.43 years. Patients with diabetes represented 98.5%. The main types of metabolic syndrome were the following associations: diabetes, high blood pressure and obesity (19.1%); diabetes, high blood pressure and dyslipidemia (16.2%); diabetes, obesity and dyslipidemia (8.8%). Urinary disorders are reported in 51.5% of cases. The main urinary symptoms were overactive bladder (58.8%), urinary incontinence (32.4%) and dysuria (16.2%). Overactive bladder was found in 64.28% of women and in 50% of men. Forty seven point thirty six percent (47.36%) of patients with diabetic neuropathy have manifested dysuria. The average score of USP was 8+/- 8.8. The average score of Qualiveen was 1.25. Metabolic syndrome is significantly associated to urinary disorders, especially the types diabetes-obesity-dyslipidemia ($p=0.004$) and diabetes-obesity- high blood pressure (HBP) ($p=0.001$). Discussion: Urinary disorders in metabolic syndrome are dominated for overactive bladder. Overactive bladder is more frequent in women and patients aged less than 40 years. Risk factors of urinary disorder are diabetes and obesity. In metabolic syndrome, quality of life is impaired in patients with urinary disorders. Conclusion: Metabolic syndrome, especially the associations diabetes-obesity and diabetes- high body circumference (HBC) to others items, increased risk of urinary disorders. Urinary symptoms in metabolic syndrome are dominated by overactive bladder. Overactive bladder is more frequent in women and patients aged less than 40 years. Dysuria is unusual in metabolic syndrome and it's not always correlated to diabetic neuropathy. Quality of life is impaired in patients with urinary disorder.

Keywords: Metabolic, Syndrome, Urinary, Disorder

1. Introduction

Metabolic syndrome is an association of metabolic and

hemodynamic factors. It is a risk factor for cardiovascular disease [1]. Prevalence of metabolic syndrome is 31.2% in Tunisia and 35% in United States of America [2, 3]. In a

published study in Diabetes and Metabolism, the frequency of metabolic syndrome was 76.12% for Moroccan patients with diabetes. It was 40% for Moroccan patients with obesity. Outwards of cardiovascular impact, metabolic syndrome is associated to urinary disorders [4, 5]. Overactive Bladder is the most frequent urinary disorders in metabolic syndrome [4, 6, 7]. Mechanisms of overactive bladder are through hyperglycemia, diabetes and atherosclerosis. Pathophysiological mechanism of diabetes includes nervous system dysfunction [8]. High blood pressure and diabetes increase urinary uric acid [9] and encourage urolithiasis. Urinary disorders in metabolic syndrome are studied. Diabetes, high body circumference, high blood pressure are recognized as risk factors of urinary disorders [10, 5, 12, 13, 8, 11, 14]. Their impact on quality of patients life poorly documented. Urinary disorders can have an impact in professional activity and quality of life. The focus of our study was to determine the types of metabolic syndrome as a largest provider of urinary disorders and the impact of these metabolic troubles on the quality of patients life.

2. Methodology

We conducted a cross-sectional, descriptive, analytical multicenter study from January to May 2013. It was done in three centers: the departments of Physical Medicine and endocrinology of university hospital Ibn Rochd of Casablanca and the Lions Club's "Insulin bank" of Cotonou, Benin. Patients with metabolic syndrome and under adapted therapeutic were included. Metabolic syndrome was diagnosed according the NCEP ATP III which is defined by the presence of, at least, three of the following criteria:

- Waist circumference > 102cm (M), 88cm (W)
- Hypertriglyceridemia (triglycerides \geq 150mg/dl)
- Cholesterolemia < 40mg/dl (M) , 50mg/dl (W)
- Blood pressure \geq 130/85mmHg or medication
- Fasting plasma glucose \geq 110mg/dl [15]

Patients with adenomas of prostatic, genital prolapse, diabetic nephropathy, pelvic surgery, neurological disorders (stroke, Parkinson disease, spine injury, multiple sclerosis, and diuretic treatment) were not included. Physicians have administered a questionnaire to eligible patients about sociodemographic characteristics, body mass index, waist circumference, diabetes' duration, evolution, complications and nature of medication. Laboratory tests, concerning fasting glycemia, glycosylated hemoglobin, High density lipoprotein cholesterol, triglyceridemia and performed in the last six months, have been noted. Evaluation of Urinary disorder was conducted by Urinary Symptoms Profile Scale (USP). Urinary Symptoms Profile Scale has ten items. It has evaluated urinary leakage, overactive bladder and dysuria during the last four weeks. Results are reported as total score. Score was proportional to severity urinary disorders. SF Qualiveen Scale was administered only to patients with urinary disorder. SF Qualiveen has

appreciated both with limitations, fears, feeling and frequency of limitations. Items were formulated with direct questions and answers were given as a score ranging zero to four. Each dimension composed two items. Dimension score was the mean of all items. A score greater than or equal to two means that dimensions are affected. Qualiveen score was the mean of all dimensions. Data were analyzed with SPSS 16.0 software. Test was performed with chi 2 methods. The significance level was set to 5%.

3. Results

3.1. Sociodemographic Characteristics

Sixty eight (68) patients have been included in the study. 64.70% of patients were Moroccan. The mean of age was 54.43 \pm 10.8 years (31-84). Forty five point fifty eight percent (45.58%) patients were aged between 51 and 60 years against 27.94% between 61 and 80 years. Study population was made of 82.2% female and 17.8% men. 83.3% of patients were married, 10.3% were widows, 4.4% singles and divorced 1.5%.

3.2. Metabolic Syndrome Components

Patients with diabetes are represented 98.5% of cases and 83.8% of patients had high blood pressure. Obesity was noted in 75% of cases. Dyslipidemia was presented in 61.8% of cases. 48.5% of patients had high body circumference. Diabetes duration was more than ten years in 38.2% of cases against 20.6% between two and five years. It was between five and ten years in 19.1% of patients and lower than one year in 6% of cases. Diabetic neuropathy was found in 22.1% of cases. It was associated to retinopathy in 5.9%.

3.3. Types of Metabolic Syndrome

Patients with more of three elements of metabolic syndrome are represented 39.7%. Association diabetes-high blood pressure and obesity was found in 19.1%. Dyslipidemia was associated for high blood pressure and diabetes in 16.2%. Patients with obesity, dyslipidemia and diabetes are represented 8.8% of cases. Table 1 shows types of metabolic syndrome.

3.4. Urinary Disorders

Fifty one point five percent (51.5%) of patients have presented urinary disorders. Urinary disorders were more frequent in women (82.85%). The main urinary symptoms were overactive bladder (58.8%), urinary incontinence (32.4%) and dysuria (16.2%). The average score of USP was 8 \pm 8.8. The mean score of dysuria was 0.4. Overactive bladder score was 5.81 against 1.68 for urinary incontinence. Overactive bladder was found in 64.28% of women and in 50% of men. It occurred more in the age group between 30-40 years (71.42%). Results are presented in Table 2. Dysuria occurred more frequently in patients

with diabetic neuropathy (47.36%). Urinary disorders were reported mostly in patients with more than three elements of metabolic syndrome represented (55.55%). Metabolic syndrome especially the associations diabetes-obesity-dyslipidemia ($p=0.004$); diabetes-dyslipidemia-high body circumference ($p=0.000$); diabetes-high blood pressure-obesity ($p=0.001$) were correlated significantly of urinary disorders. The main risk factors of urinary disorders in metabolic syndrome were diabetes ($p=0.003$) and obesity ($p=0.000$). Results are presented in table 1.

3.5. Quality of Life

The average Qualiveen in patients with urinary disorder was 1.25. Average score was 1.13 for fear dimension against 0.7 for bother with limitations. It was less important for feeling dimension (0.67) and frequency of limitations (0.55). Urinary disorders in metabolic syndrome have affected fears in 38.23% of cases. Fear was affected enormously in 15.38% and so much in 38.46%.

Impact of urinary disorders on others dimensions was less important. Bother with limitations are affected in 19.11%, frequency of limitations in 17.64% and feeling in 16.17%.

4. Discussion

Urinary disorders in metabolic syndrome are recurrent. There are dominated by overactive bladder [6, 7]. Boudokhane and al have found overactive bladder in 85.2% of patients with metabolic syndrome. There is no gender difference [14]. Others authors have noted that frequency of overactive bladder in metabolic syndrome depends on sex. It is more frequent in women [5, 14]. Tai and al found frequency of overactive bladders to 52% in women population with metabolic syndrome [16]. In our study, proportion of overactive bladders in women population is higher than results of Tai and al. Urinary disorders are more common among women with metabolic syndrome. In European general population, overactive bladders symptoms were found in 15.6% of male subjects >40 years old. This frequency is increased with advancing age [17]. In United State, Stewart noted similiary prevalence for overactive bladders [18]. Overactive bladder is more frequent in patient with metabolic syndrome than general population. Leak urinary represented 38.2%. Dysuria is less frequent [14]. Dysuria in metabolic syndrome is correlated of diabetic neuropathy [14]. About overactive bladder and leak urinary our results are similar to data of literature [5, 14]. In our study, dysuria is less frequent [14]. We found that diabetic neuropathy is unusual. Age is not a risk factor for urinary disorder in metabolic syndrome [19]. The mean of age of patients with metabolic syndrome is 56.2+/- 9.2 years (30-70) [14]. Our results are similar of those data.

High blood pressure, high body circumference, high body mass index, dyslipidemia and high post prandial glycemia are risk factors of urinary disorders in metabolic syndrome [14, 5, 20]. Obesity and diabetes are risk factors of urinary disorders in our study. Mechanisms of urinary disorders in metabolic syndrome are variable. In obesity patients, endocrine mechanism involves leptin [21]. An increased abdominal pressure is noted. This leads to increase bladder pressure and stimulate the end of urethra [22]. Hyperinsulinemia in diabetic patients is accountable for overactive and increased prostatic smooth muscle tone. Hyperglycemia increased cytoplasmic calcium in smooth muscle and neural tissue, stimulate sympathetic nervous system [23]. Diabetes, benign prostatic hyperplasia, neurogenic factors explains urinary dysfunction in diabetic patients with metabolic syndrome [24, 25]. Studies showed a relationship between age and overactive bladder in metabolic syndrome [26, 27]. Boudokhane and al aren't found a correlation [14]. We are found a relationship between age and urinary disorders ($p=0.004$). Any relationship was found between overactive bladders and age in our study. Risk factors in metabolic syndrome are known. Effect of their association is poorly documented. An association of risk factors has a synergic or antagonist effect. Metabolic syndrome especially the associations diabetes-obesity- dyslipidemia; diabetes-high blood pressure- obesity were correlated significantly of urinary disorders. High body circumference is not a risk factor of urinary disorder in metabolic syndrome. The association high body circumference to diabetes and dyslipidemia, increased significantly risk of urinary disorder ($p=0.000$). Impact of urinary disorders on quality of life poorly documented. Chartier and al, found that urinary disorders are disturbed daily activity, professional activity and quality of life [28]. Kupelian and al have found similar results [29]. In our study, urinary disorders impair quality of life. Impact is greater for fear dimension.

5. Conclusion

Metabolic syndrome is usual in african population. Metabolic syndrome increased risk of urinary disorder. Urinary disorder is more frequent in patients with diabetes and obesity, or diabetes and high body circumference. Women are more affected by urinary disorders in metabolic syndrome. Urinary symptoms are dominated by overactive bladder which more frequent in women. Dysuria is unusual in metabolic syndrome. Unlike data of literature, dysuria in our study is not correlated to diabetic neuropathy. Urinary disorders in metabolic syndrome impair quality of life. Impact is greater for fear and bother with limitations dimensions.

Table 1. Metabolic syndrome / urinary disorders.

		Number of cases	Urinary disorders (%)	Chi ²	p
Metabolic Syndrome	Diabetes + obesity + dyslipidemia	7	57.1	8.1	0.004
	More than three elements	27	55.55	0.01	0.9
	Diabetes + HBP + dyslipidemia	11	54.54	1.3	0.2
	Diabetes + dyslipidemia+ HBC	4	50	12.6	0.000
	Diabetes+ HBP+ obesity	13	46.15	10.9	0.001
	Diabetes +HBP+ HBC	3	33.33	2.8	0.09
	HBP+ obesity+ dyslipidemia	1	100		
	Diabetes+ obesity+ HBC	1	0		
	Obesity+dyslipidemia+ HBC	1	0		
Risk factors of urinary disorder	Glycemia	43	67.4	0.7	0.4
	Glycated Hemoglobin	41	60.9	0.21	0.6
	Dyslipidemia	42	57.1	0.4	0.5
	HBP	57	49.12	0.6	0.8
	Diabetes	67	52.2	8.6	0.003
	HBC > 102cm	33	54.54	0.01	0.9
	BMI > 30	51	52.9	17.3	0.000

Table 2. Age/ overactive Bladder

Age (years)	Overactive bladder		Total
	Yes	No	
30-40	5	2	7
41-50	4	7	11
51-60	17	14	31
61-80	11	8	19
Total	37	31	68

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