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Prevalence of Metabolic Syndrome in Patients with Bronchial Asthma

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Abstract: Bronchial asthma and metabolic syndrome are serious health problems that are growing rapidly around the world. Reversible airway obstruction with hyperresponsiveness is the main criterion for bronchial asthma, while hypertension, obesity, dyslipidemia, and type 2 diabetes mellitus are the main criteria for MS. It is estimated that a quarter of the world's population has MS and an increased cardiovascular risk compared to people without it. Diabetes is 5 times more common in people with MS. Hyperglycemia and hyperinsulinemia have been found to have clinically significant adverse effects on airway structure and function; performance and health status of the subjects.

To date, the prevalence of metabolic syndrome in patients with bronchial asthma has not been studied enough.

Keywords: bronchial asthma, metabolic syndrome, arterial hypertension, obesity, dyslipidemia, type 2 diabetes mellitus.

Purpose: to study the prevalence and consequences of metabolic syndrome in patients with bronchial asthma.

Materials and Methods: A cross-sectional study was conducted in 320 patients with asthma. In the study, patients admitted to the pulmonology department of the regional multidisciplinary hospital were selected. Clinical and laboratory data, including history, clinical examination, spirometry, blood analysis, EChT, liver and kidney function, lipid spectrum (UZLP cholesterol, triglycerides) and CRO levels were analyzed. Body weight, height, TVI (weight kg/height meter ^{2}) and waist circumference were measured in all patients. The Diabetes Federation (IDF) was used to diagnose MS [4]. MS was diagnosed when at least three of the following criteria were present: 1) waist circumference ≥ 94 cm in men and ≥ 80 cm in women; 2) systolic blood pressure ≥ 130 mm Hg. and/or diastolic blood pressure ≥ 85 mmHg or continuous therapy for arterial hypertension; 3) postprandial glucose > 100 mg/dL or ongoing therapy for high glucose; 4) low HDL-C < 40 mg/dl in men or < 50 mg/dl in women or special treatment of this condition; 5) triglycerides ≥150 mg/dL or specific treatment for this condition.

Results and analyses All biochemical and anthropometric parameters related to the diagnosis of MS are presented in Table 1. According to the IDF classification, MS was diagnosed in 184 (57.5%) patients with bronchial asthma.

The proportion of each component of MS in asthmatic patients was assessed. Abdominal obesity was observed in 40%, low HDL-C levels in 40%, increased meal glucose in 27.5%, high triglyceride levels in 15%, and high arterial blood pressure in 12.5%. Therefore, in patients with bronchial

asthma, the lowest level of HDL-Chol and the highest percentage of abdominal obesity were found, followed by the amount of glucose at dinner (40, 40 and 27.5%), and TG and AH were found at the lowest frequency (15 and 12.5%, respectively). In patients with asthma, the most common component was increased waist circumference (40%) and lower HDL-Chol (40%) (**Table** 1).

Table 1. The demographic and metabolic characteristics of the study groups.

Clinical Parameters	Asthma (320)
Age	45.60 ± 11.11
Sex	-
Females	224 (70%)
Males	96 (30%)
BMI (kg/m2)	23.54 ± 3.18
Waist circumference	97.98 ± 15.55
SBP	133 ± 18.76
DBP	81 ± 10.57
FBS (mg/dl)	151.05 ± 65.36
Triglyceride (mg/dl)	121.41 ± 106.59
HDL-Chol (mg/dl)	49.0 ± 15.8
CRP	6.3 ± 2.1
FEV1	44.85 ± 17.89
FEV1/Fvc	65.15 ± 13.02
Met syndrome	184 (57.5%)

Data are presented as mean ± SD or as frequency and percentage; BMI: Body Mass Index; CRP: C reactive protein; FBS: Fasting blood sugar; SBP: systolic blood pressure; DBP: diastolic blood pressure; LDL: Low Density Lipoprotein; HDL: High Density Lipoprotein; FEV-1: Forced Expiratory Volume in the first second; Mets: Metabolic syndrome.

24 (7.5%) patients with bronchial asthma without MS criteria (n-136) had no symptoms of metabolic syndrome, 56 (17.5%) had at least one parameter of metabolic syndrome, and 56 (17.5%) had two parameters of metabolic syndrome.

Table 2. Criteria of metabolic syndrome of the study population.

-	Asthma		P value
Clinical Parameters	MS	No MS	
Age	46.45	44.75	0.63
Females	37.50%	32.50%	0.313
Males	20%	10%	0.053
BMI	23.99 ± 3.72	21.55 ± 4.33	0.065
SBP	138.5 ± 19.40	127.5 ± 16.8	0.06
DBP	87.5 ± 4.729	74.5 ± 10.87	0.001
FEV1	41.95 ± 20.84	47.75 ± 14.3	0.31
FEV1/FVC	63.9 ± 15.9	64.4 ± 9.56	0.72
FBS	191.80 ± 70.39	110.3 ± 17.81	0.001
Triglyceride (mg/dl)	155.4 ± 140.1	87.4 ± 35.37	0.042
HDL-Chol (mg/dl)	58.5 ± 9.5	51.7 ± 7.5	0.47
CRP	7.2 ± 1.54*	5.6 ± 2.69	0.03

MS: Metabolic syndrome; BMI: Body Mass Index; CRP: C reactive protein; FBS: Fasting blood sugar; SBP: systolic blood pressure; DBP: diastolic blood pressure; LDL: Low Density Lipoprotein; HDL: High Density Lipoprotein; FEV-1: Forced Expiratory Volume in the first second.

When comparing the group of non-asthmatic MS and those with MS asthma, waist circumference (P = 0.0158), SBP: (P = 0.025), DBP (P = 0.0157), triglycerides (P = 0.0264), glucose content of the

meal (P = 0.0001) were significant between the two groups. a slight difference in the indicators was observed (Table 2.).

Correlations between MS and clinical parameters in patients with MS are shown in Table 3. In patients with asthma, FEV-1 (r = 0.33, P < 0.03), SBP (r = 0.32, P < 0.04), DBP (r = 0.62, P < 0.001) and FBS (r = 0.68, P < 0.001) indicators were found to be correctly correlated with MS.

Table 3. Correlation between clinical parameters and MS.

Test parameter	Asthma with MS	
	r	P
Age	0.05	0.74
Sex	0.1	0.5
BMI	0.26	0.1
SBP	0.32	0.04
DBP	0.62	0.001
FEV1	0.33	0.03
FEV1/FVC	0.24	0.13
FBS (mg/dl)	0.68	0.001
Total chol (mg/dl)	0.24	0.13
riglyceride (mg/dl)	0.18	0.26
HDL-Chol (mg/dl)	0.08	0.59
CRP	0.01	0.93

Discussion: Our study is the first to assess the prevalence of metabolic syndrome in patients with asthma in the city of Bukhara, and to examine the relationship between comorbidities and asthma characteristics and metabolic syndrome.

The main results of this study were that MS was detected in (57.5%) patients with asthma. Metabolic of the syndrome spreading whole in the world difference does; his and the level of meeting is different. Various local according to the data presented in the studies the prevalence of metabolic syndrome in the population is 18-46% [12]. Ours the result of our research received from the results high b died. _ it's long and b. He is suffering from asthma in patients metabolic of the syndrome spreading by learning turned out to be 36.7% in these studies did , this our from the result of our research is low [7]. Diagnosis to put for used different criteria and studies on b _ populations between _ differences (physical activity, food, life style, age, smoking and others) metabolic of the syndrome spread differences partially explanation can.

Ours with asthma in our study hurt in patients the most the most common component is waist circumference (40%) and It was determined that the HDL-Chol will be low (40%) . Previous research data showed that type 2 diabetes, dyslipidemia and hypertension with asthma in patients more occurs. Of this the reason is that he is suffering from asthma of obesity in patients spreading and asthmatics by from regular steroid therapy use to be can Adeyeye and others with asthma hurt of obesity in patients prevalence is 49.4% that he did found out that and ours to our research than is high [6].

Obesity and asthma with is described . Obesity increases the level of TNF-a , angiotensinogen , of plasminogen-1 inhibitor activation , IL-6, leptin, adiponectin level decline endothelial functions strengthens and inflammation against to the environment take characterized by the arrival [1,2] . TNF-α also in asthma breath of the ways allergic reactions participation in the beginning is enough A meta- analysis obesity and the development of asthma between dependence showed [15]. Bronchial

asthma is one how many phenotypes contained complicated is a syndrome. Obesity with dependence in previous studies as well seeing developed ; however , this of relationships main mechanism it seems more complicated and only the body weight gain with not explained [13]. Metabolic syndrome - systemic fire status being this of asthma to appear and to the noise effect shows. This is in the diagnostic algorithm and the disease more wider evaluation strategic in the approach new opening up possibilities to potential have has been not studied process [16,17].

We are those who have MS and MS is not dead patients statistically between _ _ important the difference found, however these indicators are statistically significant according to functional parameters b have not.

Summary: BA with in patients metabolic of the syndrome spreading high _ Comorbidity in patients with metabolic syndrome prevention get and to treatment developed complex measures aimed at exit importance was determined . for MS risk factors timely detection of asthma patients _ in patients complications prevention get and life quality improve for important can take place .

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