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IN ACTIVE DETECTION OF DIABETES AND PULMONARY TUBERCULOSIS RESULTS OF THE CONDUCTED INVESTIGATION AND MODERN GENERAL DESCRIPTION

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Abstract

Current issues of the dissertation. Relevance and necessity of the dissertation topic. According to the Presidential decree on the implementation of the new development strategy of Uzbekistan in the "year of human attention and quality education" for **2022-2026,** the following tasks are assigned to the health care system: preventive examination of **12.6** million people aged **18-40, 40-** screening **6.3** million young and older people without chronic diseases for cardiovascular diseases and diabetes, and 3 million people for early detection of oncological diseases."

According to the information presented in this 309-item state program, there are unfavorable epidemiological conditions among the population that increase the risk of developing socially significant acute and chronic infectious and non-infectious diseases. For example, it is noted that **10.7** million people in the country do not lead a healthy lifestyle. **16.5** percent of the population consumes tobacco and 4.7 percent alcohol, 16.0 percent do not eat enough fruits and vegetables, 36.6 percent add extra salt to food, **32.9** percent have OTV and **23.5** percent have obesity, and 38 percent have high blood pressure and **8.4** percent have high blood sugar, **26.0** percent have lack of physical activity has been identified or problems related to them have arisen.

At the global level, alarming statistics have been announced, especially regarding DM and Pulmonary Tuberculosis. Currently, 6.1% of the world's population has type 2 diabetes. According to British researchers, this disease will continue to increase, and by 2030, 1.1 billion people will be affected by this disease.

Second, according to the WHO, the problem of early detection of pulmonary tuberculosis is a pressing issue for developing countries with a high prevalence of this disease (**WHO, 2021**).

The level of study of the problem. In recent years, due to the rapid spread of type 2 diabetes (DM2), the situation with pulmonary tuberculosis, one of the most common diseases in this population, has worsened. According to WHO data, in 2017 there were **790,000** people with DM2 and OS comorbidity (**WHO, 2018**). There are no epidemiological data on the incidence of tuberculosis in the population infected with DM2 in the regions of Uzbekistan. In particular, in the conditions of the Fergana Valley, the frequency and epidemiologic-clinical nature of pulmonary tuberculosis in the population infected with DM2 have not been studied. From the literature, we could not find detailed

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studies of epidemiological and clinical contemporary characteristics, risk factors and regional aspects of prevention of pulmonary tuberculosis in the population with DM2.

DM2 attracts attention due to the rapid growth rate compared to other non-communicable diseases (NCDs). For example, in the last 10 years, the population of the world with DM2 has doubled, and according to the data published at the beginning of **2023**, it will exceed **500 million**. It continues to grow and is **10.0%** of the total population in some countries that have adopted a Western lifestyle. In half of the population of European countries, the diagnosis is not made in time and the effects of diabetes on the internal organs are not sufficiently addressed (**ESD/EASD, 2019**).

Current research data suggest that by **2045**, more than **600 million** people worldwide will have DM2 and approximately the same number will have prediabetes. The same is predicted in Uzbekistan.

These figures raise serious questions, especially in the pulmonary TB population with DM2. DM2 as a risk factor for pulmonary tuberculosis requires further investigation and the need to develop individualized approaches based on the results of such studies in specific regions and populations.

An analysis of the results of research conducted by foreign and domestic authors, as well as the annual reports of WHO on tuberculosis, show that today, fighting tuberculosis and controlling its spread remains one of the most important tasks in the world.

This means that the problem of screening and early detection of pulmonary tuberculosis and risk factors is of great medical and socio-economic importance, and is becoming more relevant against the background of the ongoing pandemic of non-infectious diseases, primarily in connection with DM2.

Currently, the national anti-tuberculosis programs of most countries are based on inactive (passive) detection of tuberculosis, there is no tuberculosis screening system and screening prevention among the population.

At the same time, the analysis of randomized controlled trials testifies to the high effectiveness of the "active screening" (epidemiological) approach in the diagnosis of tuberculosis, especially in the conditions of the high prevalence of tuberculosis with comorbidity. can reduce morbidity and mortality.

Screening and active prevention with science-based screening is an important/indispensable element of modern clinical phthisiology, which is at the forefront of the fight between high-risk populations/humans and pulmonary tuberculosis. Many modern researchers have come to this conclusion.

Among the population with comorbid pathology, in particular with diabetes, the important diagnostic and clinical, as well as prognostic and preventive value of epidemiological approaches in the diagnosis of pulmonary tuberculosis have been determined with some conclusions.

The purpose of the research is to study the frequency and clinical-epidemiological characteristics of pulmonary tuberculosis, its risk factors in the population with diabetes in the conditions of the Fergana Valley of Uzbekistan, and to develop ways of prevention.

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Research material and methods

The research was conducted in the population of 600 patients with diabetes with pulmonary tuberculosis, aged 18 to 90, who were treated in Andijan and Namangan regional phthisiatric hospitals in 2022-2023: the control group was made up of 100 people with tuberculosis and no diabetes. Among them, 328 (55%) of the main group are men and 272 (45%) are women. In the control group, 56 (56%) were men and 44 (44%) were women. The population of patients involved in the study was characterized by age in the main and control groups as follows: 18-29 years old - 20 (3.3%) and 20 (20.0%), 30-33 -31 (5.17%) and 17 (17%) , 40-49-100 (16.67%) and 12 (12%), 50-59-197 (32.83%) and 26 (26.0%), 60-69 -187 (31.27%) and 16 (16.0%), 59 (9.84%) and 7 (7.0%) at 70-79, 5 (0.83%) and 2 (20) at 80-89, ≥ 90 years old - 1 (0.17%) and 00 (0.0%).

Methods of epidemiological investigation.

The entire patient population involved in the examination was analyzed and studied using the "Questionnaire-screening questionnaire" (Prof. U.K. Qayumov, 2021). According to the questionnaire, risk factors were determined and evaluated: 1) smoking-1 cigarette per day or when an episode of light smoking was detected, this factor was accepted; 2) this risk factor (XO) was recognized when there is a genetic predisposition to tuberculosis and its complications in fathers and mothers or relatives; 3) alcohol consumption - population - in a patient, when an episode of alcohol consumption was confirmed once a month, this factor was accepted as XO; 4) hypodynamia - population - this XO was accepted when the patient engaged in physical work or physical education for less than 2 hours per week. 5) consumption of fruits and vegetables less than the norm (MSMKI) - consumption of fruit and vegetable products in a small amount of less than 40 kg per day in a population patient this factor, which was determined by habit, was taken as a risk factor; 6) passport data, personal and family anamnesis data, previous diseases, drug abuse habits, and information about being in infectious disease centers; 7) comorbid diseases (diabetes and other endocrine pathologies, diseases of internal organs, acute infections) and iatrogenic factors (poor diet, unhealthy lifestyle, drug abuse).

WHO diagnostic criteria were used to classify each factor as a risk factor (WHO, 2020)..

Biochemical examination methods: Liver enzymes aspartate aminotransferase (AST), alanine transaminase (ALT), total, bound and unbound bilirubin, alkaline phosphatase (standard kits "Vektor Best") were examined biochemically in all population-patients.

Cholesterol (XS) and triglycerides (TG), glucose, total protein, albumin, potassium, sodium concentrations and coagulogram indicators in the blood serum of patients were determined using the technical capabilities of the TB dispensary laboratories. The concentration of lipids was determined by the autoanalyzer "technikon AA2" (USA) and the amount of microelements by atomic absorption method in AAS-34 and AAS-IN atomic-absorption spectrometers. HS ≥ 5.0 mmol/l, TG ≥ 1.7 mmol were considered hypercholesterolemia and hypertriglyceridemia. Hypernatremia was defined as Na ≥ 148 meq/l, potassium ≤ 3.5 meq/l as hypokalemia, and calcium ≤ 2.2 mmol/l as hypocalcemia.

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ADA (**American Diabetes Association, 2015**) and WHO (1999-2013) diagnostic criteria were used to assess glycemia:

Detection time	Blood glucose concentration, mmol/l
The norm	
in the morning	< 5.6
Diabetes	
in the morning	≥6.1
Impaired glucose tolerance	
in the morning	< 6.1
Disorders of postprandial glycemia	
in the morning	>5.6 и < 6.1

Glycated hemoglobin (HbA,C) was determined and evaluated in blood, its level ≥ 6.5% was considered as a risk factor and a criterion for diagnosing DM2-type.

In addition, its concentration was used to evaluate the choice of therapy in DM2O'Sq (in pharmacoepidemiological analysis) (**ADA, 2015**):

	In a young patient	In a middle-aged patient	In old age
There are no severe macrovascular complications and/or no risk of severe hypoglycemia	< 6.5%	<7.0%	<7.5%
There are severe macrovascular complications and/or there is a risk of severe hypoglycemia	<7.0%	<7.5%	<8.0%

Patients underwent echocardiography (ExoKG) - if necessary, ECG, multi-slice computed tomography (MCCT) (if necessary), ultrasound examination (USE) and radiography of the chest cavity by methods accepted and used in clinical practice. Anthropometric measurements were performed: obesity, excess body weight (OTV), underweight (TVE). According to WHO criteria, Ketle's index (kg/m2) was evaluated as follows (per population-patient)(WHO, 1997):

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Indicators	Value, kg/m²
Lack of weight	< 18.5
Normal weight	18.5-24.9
Excess body weight	25-29.9
Obesity	

When measuring and evaluating arterial pressure (AB), recommendations developed by **WHO** experts (**WHO, 1999**) were used (**second edition, 2004**) recommendations of experts report of the scientific society of cardiology of the Russian Federation on arterial hypertension (in mm sim ust) AB: systolic **AB ≤ 139**; diastolic AB ≤ 89, arterial hypertension (**AG) – SAB ≥ 140; DAB ≥ 90 mm** on "AG + **DM" - SAB >140; DAB > 85 mm** cm above (**ESC, 2013**).

Methods of microbiological investigations and pharmacoepidemiological analysis. Each patient underwent a microbiological examination: sputum analysis for MBT using a fluorescent microscope, cultivation of tuberculosis bacilli in liquid and solid media was performed and monitored dynamically.

The treatment process in each OS and DM2O'Sq patients was studied and evaluated using a special "Pharmacoepidemiological Questionnaire-Questionnaire". A retrospective pharmacoepidemiological study was performed by the "snapshot cross-sectional" method by copying the medical history and medical card data conducted in the tuberculosis dispensary hospital and polyclinic. Such a scientific approach is widely used and recommended by compatriot researchers (Rakhmatova D.B, 2021)

General clinical analyzes of blood and urine. Laboratory methods include the study of general clinical analyzes of blood and urine, in which we determined and studied: the number of erythrocytes (**RBC**), hemoglobin (**HBG**), color indicator, hematocrit (**HCT**), leukocyte count (WBC), leukocyte formula, neutrophils, eosinophils , basophils, lymphocytes, monocytes, plasma cells, EChT, relative density of urine, amount of proteins in urine, leukocytes and erythrocytes in urine tissue, bacteria, epithelial cells

Pulmonary tuberculosis was diagnosed based on comprehensive examination, diagnosis of diabetes was made based on the results of HbA,C (≥6.5%) and serum glucose level (≥6.1 mmol/l).

CONCLUSIONS

1. Epidemiological research in the early detection, prevention and treatment of pulmonary tuberculosis in the diabetic population with tuberculosis and in the non-diabetic population with tuberculosis is an effective, efficient, economical, medically useful and promising safe scientific and practical direction.

2. In the modern conditions of the Fergana Valley, different forms of pulmonary tuberculosis are determined by the frequency of distribution among the population with and without diabetes. (focal pulmonary tuberculosis -**2.83**% and **1.0%**, infiltrative pulmonary tuberculosis - **91.3**% and 77.0%,

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tuberculoma - **2.17**% and **0.00**%, fibro-cavernous pulmonary tuberculosis - from **3.83**% and **12.0**%, disseminated pulmonary tuberculosis - from **1.83**% and **10.0**%, pulmonary tuberculosis with cirrhotic form - from 0.50% and **4.0**%, primary pulmonary tuberculosis from **69.0**% and relapsing pulmonary tuberculosis -**17.0**%, pulmonary tuberculosis with erosion of lung tissue -**46.5**% and **62.0**%, pulmonary tuberculosis with resistance to multiple anti-tuberculosis drugs -**12.7%** and **22.0**%, MBT is characterized by existing pulmonary tuberculosis (from **86.7**% and **54.0**%) and gender-specific epidemiological characteristics.

3. Among the diabetic population with pulmonary tuberculosis, 10 external factors are identified as risk factors with the following distribution frequencies: noise-**30.0**%, dust-**27.3%**, chemical factors-**2.5**%, ions-**0.3**%, current -**0.7%**, hot sex-**0.5**%, pesticides-**1.5**%, defoliants-0.2%, nitrates (only in DM2 O'Sqb) and other total factors-**10,2**%.

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