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The prevalence of risk factors of developing of cardio-vascular diseases and diabetes among the urban population of Karaganda region

Frequency of developing of diabetes mellitus in patients with risk factors developing of cardiovascular diseases was investigated. The prevalence of main modifiable factors that generate a high risk of diabetes and cardiovascular disease were investigated in 891 respondents of the city of Saran, Land Karaganda (population 56,000, city-satellite of Karaganda) using of international questionnaire FINDRISC and cardiovascular risk calculator-SCORE. It was showed that increasing of risk of cardiovascular diseases accompanied parallel by increasing of risk of diabetes. Among of urban population of Karaganda region it were established the role of risk factors like obesity, fasting glycemia, arterial hypertension, hypercholesterolemia, allowing realization of preventive activities in the target population.

Key words: risk factors, diabetes mellitus, cardio-vascular diseases, Karaganda region, obesity, arterial hypertension, hyperholesterolaemia, hyperglycemia.

Actuality

Last period it was reported a intensive increase number of incidence of diabetes mellitus (DM) in the world. It is expected that by the 2035g. the prevalence of DM be increase to 347 million. people and 145 millions in rural areas [1]. Kazakhstan DM is rankedas socially significant disease, requiring a system of decisions and actions of the State supporting. According to data from a large clinical trials of diabetes is an independent factor for development of cardiovascular diseases, which led to the emergence of the term of cardiometabolic syndrome [2]. Each every second man in the group very high cardiovascular risk: each second man has high and very high risk of developing diabetes mellitus [3].

According to the State Health Kazakhstan Program named «Densaulyk 2016–2020», as well as plan of WHO on prevention and control of not infectious diseases is one of the objectives of improving of state of health by prevention of risk factors at the global, regional and national levels [4, 5]. In this regard, effective measures reducing premature mortality from diseases of the circulatory system and DM, is prevention, which is possible as result of studying the prevalence of risk factors for these diseases. In this context we tried to investigate the risk of development of diabetes mellitus among respondents with varying degrees of cardio-vascular risk, as well as to identify the prevalence of modifiable factors in investigated groups.

Research objective: to investigate the risk of development of diabetes mellitus in patients with various level of cardiovascular risk and also to study prevalence of the main modified factors forming high risk of a diabetes mellitus and of cardiovascular diseases

Materials and methods

This clinical investigation is based on the results using of questionnaire and clinical analysis of 891 respondents of the city of Saran, the Karaganda region, with existence of risk of cardiovascular diseases at the age of 18–65 years are the basis for a research, a male made 20,4 % of them, the woman of 79,5 %. The volume of selection was defined proceeding from necessary significance value. Screening included questioning, with use of the international questionnaires on establishment of risk factors of socially important diseases as SD, the cardiovascular diseases (CD); anthropometry, measurement of the ABP, definition of a glucose and cholesterin of a blood. Definition of a glucose of a blood was carried out by means of the Accu-Chek glucose meter (Roche Diagnostics, Germany), a blood cholesterol — Accutrend Plus (Roche Diagnostics, Germany).

In the first part was carried out calculation of total cardiovascular risk (CVR) on a scale SCORE, using a special risk calculator. To assess total CVR takes into account gender, age, level of systolic HELL, smoking, total cholesterol. In the second phase 850 complete answers were selected from 891which were grouped CVR: I — no risk, low-moderate risk (<5 %), high risk (5–10 %) and very high risk (10 %). 41 answers were not selected as not completed.

Respondents with different cardiovascular risk on a scale SCORE, conducted interviews using questionnaire FINDRISC. For measuring the risk of DMfollowing questions from the questionnaire were used:

age, body mass index, waist circumference, the presence of at least 30 minutes of physical activity, blood pressure, blood glucose level, facts of presence of diabetes at family or at relatives. According to results of a questionnaire FINDRISS installed: low risk (sum of points < 7), moderate risk (sum of points $7 \leq 14$), high and very high risk (over > 15). In the group of patients with high and very high risk of diabeteswith different cardiovascular the frequency of major modifiable risk factors: low physical activity, smoking, obesity, arterial hypertension, hyperglycemia, hypercholesterolemia were investigated using of FINDRISC scale. Statistical processing was done using Microsoft Excel.

Results and discussion

According to the results of analysis of 850 respondents at 126 (14.8 %) respondents did not identify the risk of cardiovascular disease. The cardiovascular risk was confirmed at 724 respondents (85.1 %). Among respondents with the presence of CVR on a scale SCORE from 629 (86.9 %) respondents set low/moderate risk, 65 (8.9 %) respondents have high and 30 (4.2 %) respondents — very high risk (Table). Among respondents with low/moderate risk, high and very high CVR on a scale SCORE risk gradation were studied using of SCORE scope. Among respondents with low and moderate CVR at 318 (50.6 %) the low risk of DM were found, 257 (40.9 %) respondents identified as patients with moderate risk and at 54 (8.5 %) respondents found the high and very high risk of DM. Among group with high risk of CVR the low risk of DM identified in 21 respondents (32.4 %), moderate risk of DM– in 37 persons (56.8 %) and high risk (10.8 %) have 7 respondents. In patients with very high CVR a low risk of DM is defined at 5 (16.7 %) respondents, moderate risk — in11 respondents (36.6 %) and the high at 14 (46.7 %) respondents.

T a b l e

The prevalence of modifiable risk factors in varying degrees by SCORE of cardiovascular system respondents with high and very high risk of developing type 2 diabetes, %

Risk factors	Low/moderate cardiovascular risk FINDRISK high and very high	High cardiovascular risk FINDRISK high and very high	Very high cardiovascular risk FINDRISK high and very high
Lowphysicalactivity	3.9	20.1	40.1
Smoking	4.8	15.4	37.7
Obesity	19.2	33.6	100
BP >140/90 mmHg	40.3	85.1	88.9
Fastingglucose > 5.6	11.1	82.5	100
Hypercholesterolemia	11.5	26.1	45.1

Thus, a most number of respondents with very low risk of development of 2 type of DM are belong to patients with very low or moderate risk of CVR (50.6 %) while in groups with high and very high to CVR the real risk of development of 2 type of DM in the nearest 10 years were determined at 32.4 % and 16.7 % accordingly, at respondents with high risk of CVR — at 56.8 % respondents — a moderate risk of developing of DM andamong persons with very high risk of CVR more often there was a high risk of development of diabetes mellitus — at 46.7 %.

The analysis of the obtained results demonstrate that the risk of development of DM is increases as far as growth of cardiovascular risk, that confirm the presence of relation between risk of CVR and diabetes mellitus.

In a group with high and very high risk (1) and very high risk (2) of CVR we observed a for 1.9 and 10 times more low frequency of physical activity among persons with the very high risk of development of СД 2 types (Table 1) frequency of subzero physical activity in 1.9 and 10.2 time higher as compared with group low/moderate risk of developing of CVR.

Frequency of smoking was confirmed as higher among respondents with very high CVR risk and risk of DM in compared with groups with high and moderate / low risk of CVR (37.7 % against 4.8 % and 15.4 %).

Frequency of obesity revealed at 100 % respondents with very high risk of CVR and high/very high risk of development of diabetes mellitus, that in 2.9 and 5.2 time exceeds frequency in groups with high and low/moderate CVR risk accordingly.

A similar tendency is observed regarding frequency of high blood pressure in patients: most frequency was revealed in a group with high and very high risk of CVR: 88.9 % and 85.1 % accordingly that in 2 times higher than in a group with low/moderate SSR.

The high level of blood glucose level was determined at 100 % of respondents with very high cardio-vascular risk in compared with 11.1 % at respondents with low/moderate risk of CVR.

We have found the prevalence ofhypercholesterolaemia for 2–3 times more high among persons with the high and very high risk of development of 2 type of DM types in groups with very high risk of CVR and is as 45.1 and 26.1 %.

Thus, it was showed that by the important modified factors among respondents with highrisk of CVR and DM there are obesity, hyperglycemia arterial hypertension, hyperchosterolaemia, a low physical activity and smoking were revealed at many respondents with high risk developing as DM among group with high risk of CVR.

Conclusions

1. The risk of development of cardiovascular diseases accompanied by increasing of risk of developing of diabetes mellitus. Among respondents with a low/moderate cardiovascular risk there are prevalence persons with low risk of diabetes mellitus (50.6 %), at persons with high to CVR–a low risk of DM (56.8 %), with very high of CVR- a high risk of development of DM (46.7 %).

2. Among persons with the high risk of cardiovascular diseases and of high risk of DM among the urban population of the Karaganda area the important modified risk of DM factors were established, as obesity — 100 %, hyperglycemia — 100 %, hypertension — 88.9 %, hypercholesterolaemia — 56.7 %.

3. Obtained results allow to allocate group of patients for realization of purposeful prophylaxis of cardiovascular diseases and of diabetes mellitus.

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Қарағанды облысының қала тұрғындары арасында жүрек-қантамырлар ауруларының және қант диабетінің қалыптасуында қауіптілік факторының таралуы

Қарағанды облысының Саран қаласындағы 891 респонденттерінде әр түрлі дәрежедегі жүрек-қантамыр аурулары бар адамдарда қант диабетінің даму қаупі бағаланды, сонымен қатар жоғарғы дәрежелі және кардиоваскулярлы ауруларды тудыратын кең таралған негізгі модификацияланған факторлар зерттелді. Бұл зерттеу FINDRISC халықаралық сұрақнамасы мен SCORE жүрек-қантамыр қаупін есептеуіш арқылы жүргізілді. Жүрек-қантамыр аурулары қаупі өскен сайын қант диабетінің даму қаупі де жоғарылайтындығы белгілі. Қарағанды облысының қала тұрғындарының арасында семіздік, ашқарын гликемиясы, артериалды гипертензия, гиперхолестеринемия сынды ҚД қаупі бар маңызды модификацияланған факторлар анықталды. Бұл толық топта алдын ала шараларды жүргізуге мүмкіндік береді.

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Распространенность факторов риска в формировании сердечно-сосудистых заболеваний и сахарного диабета среди городского населения Карагандинской области

Авторами проведена оценка риска развития сахарного диабета у лиц с различной степенью риска развития сердечно-сосудистых заболеваний, а также изучена распространенность основных модифицируемых факторов, формирующих высокий риск сахарного диабета и кардиоваскулярных заболеваний, у 891 респондента г. Сарани Карагандинской области с использованием международного опросника FINDRISC и калькулятора сердечно-сосудистого риска — SCORE. Установлено, что по мере нарастания сердечно-сосудистого риска возрастает риск развития сахарного диабета. Среди городского населения Карагандинской области установлены значимые модифицируемые факторы риска СД: ожирение, гликемия натощак, артериальная гипертензия, гиперхолестеринемия, что позволит проводить профилактические мероприятия в целевой группе.

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