WEB OF SCIENTIST: INTERNATIONAL SCIENTIFIC RESEARCH JOURNAL
ISSN: 2776-0979, Volume 3, Issue 11, Nov., 2022

ABOUT MODELS OF EXPERIMENTAL DEVELOPMENT OF DIABETES 2

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Abstract
The paper analyzes the development models of type 2 diabetes mellitus (DM2). Rodents are best suited for this (mainly mice, including outbred lines), and rats, which have become more widely used recently. As for models of metabolic syndrome and obesity, diet-induced models are also closest in etiology and development mechanisms to DM2 in humans, among which high-fat diets (HFAs) enriched with sucrose or fructose are the most effective.

Keywords: diabetes mellitus, experiment, animals, induction, inbred, outbred.

Currently, DM has been studied to a sufficient extent, there is a large arsenal of drugs and modern treatment regimens for this pathology, but, unfortunately, the disease continues to progress. This is especially noticeable in developed countries [1, 2]. According to WHO, the number of patients diagnosed with diabetes has reached approximately 160 million, by 2025 the number of patients with this diagnosis is predicted to double, and this increase is due to an increase in patients with type 2 diabetes. The main causes of deterioration in the quality of life, disability and mortality in patients with DM are chronic complications caused by hyperglycemia (diabetic nephropathy, diabetic retinopathy, diabetic foot, diabetic neuropathy, atherosclerosis, etc.) [2]. To model DM2, mice and rats are mainly used, less often - guinea pigs, gerbils, etc. In the etiology of DM2 in humans, excess caloric nutrition and obesity are of primary importance. Diet (RD) has a significant impact on the development of DM2. For example, in mice of the outbred C57BL/6 line, the development of obesity and DM2 requires VFA (60% fat), and a faster and more pronounced effect is achieved when a large amount of sucrose is added to it. In Wistar rats, a high fructose diet (35–60% kcal from fructose) was used to induce insulin resistance. But in genetically modified lines of mice of the ApoE-/-, LDLr-/-, LDLr-/-ApoB100/100 lines, DM2 does not develop at all even on high-calorie RP [3, 4]. In experimental models of DM2, they are used as genetically modified (inbred) animals [(db/db mice, NZO mice (New Zealand Obese), TH mice (TALLYHO/Jng), Zucker Diabetic Fatty (ZDF) rats, etc.)], and outbred (C57BL/6 and BALB/c mice, Wistar

rats, etc.). Inbred mice (MI) have a developmental pathogenesis associated with obesity similar to that of humans. Therefore, they are ideal for studying the manifestations of T2DM in humans. Different lines of MI used to model T2DM differ significantly from each other. So, if the most striking characteristic of NZO mice is pronounced obesity (their body weight reaches 45 g by 3 months, and later can reach 100 g or more), then TH mice weigh 35 g by 3 months, while control lines of wild mice C57BL/6 - 27 g. Almost all researchers note that young mice under the age of 4 weeks, regardless of gender, are tolerant to the introduction of glucose, however, after puberty (earlier in males and a little later in females), they develop impaired tolerance to glucose.) 2020 - 14 . glucose load. Impaired glucose tolerance in animals is accompanied by hypersecretion of insulin (hyperinsulinemia) with subsequent development of insulin resistance: the average level of insulin in the blood plasma (not on an empty stomach) reaches 6±1 ng/ml in females and 8±1 ng/ml in male mice of the TH line , while in C57BL/6 mice it is only 0.4±0.1 ng/ml in females and 0.6±0.2 ng/ml in 6-week-old males [3, 4]. The rapid development of hyperglycemia, insulin resistance and the growth of glycated hemoglobin develops in mice against the background of only VZhR. Summarizing the above, we can conclude that mice, mainly outbred lines, are best suited for creating an experimental model of CD2. For the model of obesity in DM2, diet-induced models are the most effective, among which the most effective are VFAs, which are enriched with polysaccharides. For modeling DM, it is important to use mature animals.

Bibliography

1. Dedov I.I., Shestakova M.V., Vikulova O.K. Epidemiology of diabetes mellitus in the Russian Federation: clinical and statistical analysis, according to the Federal Register of Diabetes Mellitus. Diabetes mellitus, 2017. Volume 20. No. 1. P. 13–41. 2. Smolyansky B.L., Liflyandsky V.G. Diabetes. M.: OLMA Media Group, 2009. 640 p.
2. Joost H.-G. Al-Hasani H., Schurmann A. (eds.). Animal Models in Diabetes Research. Methods in Molecular Biology, 2012. Vol. 933. P. 325.
3. Tominaga A., Ishizaki N., Naruse Y. et al. Repeated application of low-frequency electroacupuncture improves high-fructose diet-induced insulin resistance in rats. Acupuncture. Med., 2011. Vol. 29. No. 4. P. 276–283.
4. Дилноза Саётовна Косимова. ИЗУЧЕНИЕ ЭЛЕМЕНТНОГО СПЕКТРА В КРОВИ У МЫШЕЙ С САХАРНЫМ ДИАБЕТОМ. // Современные инновации № 4 (38), 2020

5. Азиза Садиллоевна Жалилова, Дилноза Саётовна Косимова. Клинико–Лабораторная Характеристика Пациентов С Covid-19 И Предиктор Антибактериальной Терапии // CENTRAL ASIAN JOURNAL OF MEDICAL AND NATURAL SCIENCES. 2021. С. 81–86.
6. DS Kosimova, AV Paliiuk. Prohibition of Discrimination: Concepts, Features and Obligations of the State according to the Convention for the Protection of Human Rights and Fundamental Freedoms // L. & Innovative Soc'y. 2021. С. 99.
7. АА Элмурадова, ДС Косимова, НШ Шадыева. Вклад Абу али ибн Сино в развитие фитотерапии // Новый день в медицине. 2020. №4. С. 604-606.
8. Дилноза Саётовна Косимова. О моделях экспериментального развития СД2 // Современные инновации. 2020. Т. 4 № 38 С. 13-14.
9. Olimova Aziza Zokirovna, Sanoyev Bakhtiyor Abdurasulovich. OVARIAN DISEASES IN AGE OF REPRODUCTIVE WOMEN: DERMOID CYST. Volume: 01 Issue: 06 | 2021. 154-161 p
10. Olimova Aziza Zokirovna. РЕПРОДУКТИВ ЁШДАГИ ЭРКАКЛАРДА БЕПУШТЛИК САБАБЛАРИ: БУХОРО ТУМАНИ ЭПИДЕМИОЛОГИЯСИ. SCIENTIFIC PROGRESS. 2021 й 499-502p 40.
11. Olimova Aziza Zokirovna. MACRO- AND MICROSCOPIC STRUCTURE OF THE LIVER OF THREE MONTHLY WHITE RATS. ACADEMIC RESEARCH IN EDUCATIONAL SCIENCES /2021 й. 309-312
12. DS Kosimova, AU Adashev. Directions to increase productivity competitiveness in industrial enterprises // Economics and Innovative Technologies. 2019. №2. С. 17.
13. D. S Kosimova. The Genesis of the Franchising Legal Regulation. // JE Eur. L. 2018. 118-p. 37.
14. Olimova Aziza Zokirovna. Частота Встречаемости Миомы Матки У Женщин В Репродуктивном Возрасте. JOURNAL OF ADVANCED RESEARCH AND STABILITY (JARS). Volume: 01 Issue: 06 | 2021. 551-556 p
15. SU Mustafoevich ,Morphological Characteristics of Testicles under Radiation (2021.12.1)International Journal of Innovative Analyses and Emerging Technology № 1(6)P .218-222
16. Shodiev O'lmas Mustafoevich,Olimova Aziza Zokirovna. РЕПРОДУКТИВ ЁШДАГИ ЭРКАКЛАРДА БЕПУШТЛИК САБАБЛАРИ: БУХОРО ТУМАНИ ЭПИДЕМИОЛОГИЯСИ. SCIENTIFIC PROGRESS. 2021 й 499-502p
17. O'lmas Mustafaevich Shodiev(2021/11/29) Pathologies encountered in the kidney in the practice of forensic medical examination . Journal. Academicia globe:Inderscience Research.№ 2(11) P .39-43

18. Shodiev O'lmas Mustafoevich, Expression level of anti-apoptotic protein Bcl-2 in bladder papillomas(2022/8/13).Web of Scientist: International Scientific research Journal. .№ 3(8) P .297-305
19. Shodiev O'lmas Mustafoevich, Khaidarova Nargiza Akhtamovana(2022/6/19) EPITELIAL SAFE TUMORS OF BLADDER RATE, TYPES AND CAUSES. Web of Scientist: International Scientific research Journal. .№ 3(6) P .905-912
20. Shodiev O'lmas Mustafoevich, Khaidarova Nargiza Akhtamovana(2022/6/19) .MEETING OF KIDNEY CYSTERS IN COURT MEDICAL AUTOPSY PRACTICE. Web of Scientist: International Scientific research Journal. .№ 3(6) P .893-898
21. Shodiev O'lmas Mustafoevich, Khaidarova Nargiza Akhtamovana(2022). Epitelial safe tumors of bladder rate,types and causes. Web of Scientist: International Scientific research Journal. .№ 3(6) P .905-912.
22. Khaidarova Nargiza Akhtamovana,Khotamova sarvinoz Muyitdinovna(2024/4/23). European Multidisciplinary journal of Modern Science. .№ 5 P .402-406
23. Khaidarova Nargiza Akhtamovana, PANOMORPHOLOGY OF FETUS ASPHIXIA. Web of Scientist: International Scientific research Journal. .№ 3(8) P .501-508.