WEB OF SCIENTIST: INTERNATIONAL SCIENTIFIC RESEARCH JOURNAL
ISSN: 2776-0979 (Volume 2, Issue 12, Dec., 2021)

MORPHOMETRIC INDICATORS OF AORTA WALL LAYES UNDER RADIATION

Abdullaeva M. A.
BSMI

Relevance of the Topic

It is known that structural-geometric changes take place in the vessel wall for a lifetime, as do other organs. The morphometric changes that develop in the aortic wall are caused by environmental and endogenous pathological factors that affect it. In the morphometric variation of aora wall layers, it occurs first in the endothelial layer and intima, then in the elastic fibers and muscle layer, which is little studied in scientific studies (Averkin N.S. et al., 2019; Strajesko I.D. et al., 2012). The studies were conducted mainly in experimental animals, in which morphological and morphometric effects were studied as a result of environmental influences. But there are almost no scientific studies devoted to the changes that develop in the walls of the aorta and large arteries under the influence of radiation. Therefore, in this research study, our main goal was to analyze the morphometric changes that develop under the influence of radiation in the aortic wall layers of experimental animals.

Materials and Methods

The experiment was conducted on rabbits. Rabbits aged 3, 6, 9, 12 months were given gamma radiation at a dose of 1 gray for 10 days, after which the rabbits were anesthetized by instantaneous decapitation. By separating the aorta, all its parts were measured in length, diameter, and wall thickness. Fragments were cut from each for separate histological examination. The aortic segments were immersed for 48 h in a neutralized solution of 10% formalin, then washed in running water for 3 h, dehydrated in concentrated alcohols, and paraffin was poured and the lumps were prepared. Histological incisions of 5-6 microns thickness from paraffin bricks were prepared on a special microtome. From histological incisions, the paraffin material was dissolved in xylene and stained with hematoxylin and eosin dyes. Histological preparations were studied on 10, 20, 40 lenses of Leyka type microscope and the necessary areas were photographed. Morphometric calculations in microphotographs of the aortic wall of the same size on a computer monitor were performed by G.G. Avtandilov's (1990) method of "counting points" [1]. In this case, the aortic wall was placed on a grid of 200 cells on each image. The points where the grid lines corresponding to each structural element in the aortic wall image were counted were counted. To make the quantitative data obtained reliable, points were counted in 8 of the images and a mathematical mean was determined. Since the points of the grid mesh placed on the tissue cross-section are at the same distance, it is clear from the essence of this method that the tissue structures must be selected without selection. G.G. Avtandilov's lattice points correspond to the law of relativity, in which all areas of the surface of the tissue picture are uniformly distributed over the structural units. The area of all existing structural units in the figure is taken as Vv, ie 100%, the area of each of the structural units to be calculated is determined by the name of this structure, for example: Aortic wall intimacy - Vi, medichsi - Vm, adventitia - V. the relative area of the structural units under study in the tissue is calculated. The results show that each structural unit is a unit of volume in the aortic wall tissue.

Results and their discussion. The aorta was studied comprehensively in dynamics after the onset of chronic radiation sickness in animals. The results of morphometric studies showed that the intimate thickness of the aorta in the control group of 6-month-old animals was 6.87 ± 0.27 μm, while under the influence of radiation it thickened to 11.56 ± 0.35 μm. Thickening is caused by swelling and dystrophic changes in the intima tissue under the influence of necrosis, thinning of the tissue structures and thickening of the intima. In the later periods of the experiment, i.e., at 12 and 24 months of age, the thickening of the intima continued, with controls being 7.92 ± 0.33 and 8.24 ± 0.36 μm, respectively, after irradiation 12.34 ± 0.54 and 10.32 ± Thickening to 0.46 μm was observed. If the middle layer of the aortic wall is dynamic, ie at 6 months - 49.57 ± 4.08, at 12 months - 57.2 ± 4.16, and at 24 months - 69.69 ± 2.4 microns, its thickening is 6 fewer (52.86 ± 4.11 μm) thickened at the 12-month period (68.16 ± 4.16 μm) and even more thickened at 24 months (81.76 ± 3.4 μm). The thickening of such aortic wall layers under the influence of radiation has certainly been confirmed to be due to pathomorphological changes in the tissue. That is, swelling, swelling, dystrophy of cells and fibers in all layers of the aortic wall occur as a result of the addition of inflammatory and calcinous processes in the latter period. It was observed that the morphometric parameters of the aortic wall adventitial layer remained almost unchanged under the influence of radiation, and even slightly thinned at 6 and 12 months of age. In general, the total thickness of the aortic wall was 668.33 ± 4.21 μm at 6 months, 81.13 ± 4.45 μm at 12 months, and 92.28 ± 3.19 μm at 24 months, averaging 6 months after irradiation. At 8 months, at 12 months - 13.5 microns, and at 24 months - 15.5 microns.

1-жадвал Control and irradiance of aortic wall layers, mkm

Кўрсатгичлар	Гуруҳлар	6 ойлик	12 ойлик	24 ойлик
Интима	Назорат	6,87±0,27	7,92±0,33*	8,24±0,36**
	Нурланиш	**11,56±0,35**	**12,34±0,54***	**10,32±0,46****
Медия	Назорат	49,57±4,08	57,2±4,16*	69,69±2,4**
	Нурланиш	**52,86±4,11**	**68,16±4,16***	**81,76±3,4****
Адвентиция	Назорат	12,88±1,61	15,01±1,48	14,75±1,53
	Нурланиш	**11,98±1,51**	**14,04±1,48**	**15,65±2,53**
Аорта девори умумий қалинлиги	Назорат	68,33±4,21	81,13±4,45*	92,28±3,19**
	нурланиш	**76,4±5,21**	**94,54±4,45***	**107,73±6,38****

Application: * - statistical indicator difference (T-criterion, r≤0.05 relative to control indicators); ** - Difference of statistical indicators (Manna-Whitney criterion, relative to control indicators).

Subsequent morphometric examinations were devoted to calculating the diameter and area of the aortic wall and cavity after irradiation. In the first period of the experiment, i.e. in 6-month-old animals, the outer diameter of the aorta was enlarged relative to the control (2.4, ± 0.04 mm) (Table 2) group and was 2.8, ± 0.06 mm, while in the 12-month period it was 3.3 ± Thickening was observed from 0.06 mm to 4.2 ± 0.08 mm, and at 24 months from 4.4 ± 0.05 mm to 5.1 ± 0.07 mm (Table 2). In contrast, the diameter of the inner wall of the aorta was found to decrease in the dynamics of the experiment, the reason being, of course, the thickening of the aortic wall. At the 6-month period of the experiment in the control group was 1.8 ± 0.03 mm, after irradiation - up to 1.6 ± 0.03 mm, at 12 months - from 2.6 ± 0.05 mm to 2.3 ± 0.06 mm, 24 decreased from 3.6 ± 0.07 mm to 3.3 ± 0.08 mm per month. Calculations of aortic wall and cavity area showed that the aortic wall area expanded from 0.36 mm2 in the control group at 6 months to 0.42 mm2 after irradiation, 0.49 to 0.56 at 12 months, and 0.64 to 0 at 24 months. , Expanded to 72 mm2. Experimental dynamics confirmed that the expansion of the aortic wall area led to a narrowing of the cavity area. In the 6-month period, the aortic cavity area narrowed from 2.54 mm2 to 2.14 mm2 in the control group, from 5.74 mm2 to 4.64 mm2 in the 12-month period, and from 11.33 mm2 to 9.53 mm2 in the 24-month period. As a result, it was found that the Wogenworth index was higher than that of the control group at all periods of the experiment (Table 3).

Table 2 Morphometric parameters of the aorta of control animals (M ± m)

Кўрсатгичлар	6 ойлик	12 ойлик	24 ойлик
Ташқи диаметр, мм	2,4,±0,04	3,3±0,06*	4,4±0,05**
Ички диаметр, мм	1,8±0,03	2,6±0,05*	3,6±0,07**
Девори майдони, мм²	0.36	0,49	0,64
Бўшлиғи майдони, мм²	2,54	5,74*	11,33**
Вогенворт индекси	0,14	0,085*	0,056**

Application: * - statistical indicator difference (T-criterion, r≤0.05 relative to 6-month indicators); ** - Difference of statistical indicators (Manna-Whitney criterion, relative to 6-month indicators).

Table 3 Morphometric parameters of the aorta after irradiation (M ± m), in mm

Кўрсатгичлар	6 ойлик	12 ойлик	24 ойлик
Ташқи диаметр, мм	2,8,±0,06	4,2±0,08*	5,1±0,07**
Ички диаметр, мм	1,6±0,03	2,3±0,06*	3,3±0,08**
Девори майдони, мм²	0.42	0,56	0,72
Бўшлиғи майдони, мм²	2,14	4,64*	9,53**
Вогенворт индекси	0,19	0,12*	0,075**

Application: * - statistical indicator difference (T-criterion, r≤0.05 relative to control group indicators); ** - Difference of statistical indicators (Manna-Whitney criterion, control group relative to indicators).

Conclusion

Under the influence of radiation, it was found that the intimacy of the aortic wall layers thickened from the first period of the experiment, the media thickening prevailed at 12 months, the total aortic wall thickness averaged 8 microns at 6 months, 13.5 microns at 12 months, and 15.5 microns at 24 months. In the dynamics of the experiment, it was observed that the area of the aortic wall thickened and the area of the cavity relative to it decreased, resulting in the Wogenworth index increasing at all stages of the experiment according to the law of feedback.

REFERENCES

1. Averkin N.S. and dr. Morphometric parameters of the aorta at the age of different ages and conditions of chronic stress.
2. Kausova G.K., Toleu E.T., Kodasbaev A.T., Nurbakyt A.N. K voprosu profilaktikiserdechno-sosudistyx zabolevaniy // Vestnik KazNMU. 2017. №4. S.40-42.
3. Strajesko I.D. and dr. Starenie sosudov: osnovnye priznaki i mekhanizmy // Kardiovaskulyarnaya terapiya i profilaktika. 2012.№11 (4). S.93-100.
4. Wu H.H., Wang S. Strain differences in the chronic mild stress animal model of depression.Behav. Brain. Res. 2010. vol. 213. no. 1. P. 94-102.
5. NA Narzieva, N Hasanova. Communicative competence as a pedagogical model in the classrooms// ACADEMICIA: An international Multidisciplinary Research Journal 10(6),78-81, 2020
6. NA Narzieva. The concept of defined target technologies and their role in the educational process// Theoretical &Applied science, 356-360, 2020
7. NN Narzieva, Development of Education and Research Activity Profile Class Students on the Basis of Integrative and Personal Approach, www. auris-verlag, 2017
8. NN Narzieva Development of Education and Research Activity Profile Class Students on the Basis of Integrative and Personal Approach, www.auris-verlag. de, 2017
9. NN Atakulovna Factors supporting teaching and learning English in non-English speaking countries, ResearchJet Journal of Analysis and inventions 2(06), 297-305, 2021
10. OD Abdukarimovna, UU Rizoyevich Arterial Hypertension Statistics at the Level of Primary Health Care in the City of Bukhara, International Journal of Human Computing Studies, 2020
11. OD Abdukarimovna, KB Odilovna, S Shohruh, RNG Husenovich, Characteristics Of The Manifestation Of Hypertension In Patients With Dyslipidemia, European Journal of Molecular & Clinical Medicine, 2020
12. MM Giyazova Specificity of the Course and Improvement of Treatment of Diseases of the Oral Mucosa and Periodontal Cavity under the Influence of Covid 19, " ONLINE-CONFERENCES" PLATFORM, 2021
13. MM Giyazova, OS Sh,CHANGES IN THE ORAL CAVITY IN PATIENTS WITH COVID 19 DISEASES Journal For Innovative Development in Pharmaceutical and Technical Science ..., 2021

14. БО Камилова,THE INFLUENCE OF THE LOW-TEMPERATURE ENVIRONMENT ON THE ACTIVITY OF LACTASE IN VARIOUS PARTS OF THE SMALL INTESTINE
15. Новый день в медицине, 2020
16. БО Камилова, ВЛИЯНИЕ МАЛЫХ ДОЗ ПРЕПАРАТА «ЭДИЛ» НА КАРТИНУ ЛЕЙКОЦИТОВ (БЕЛЫХ КРОВЯНЫХ ТЕЛЕЦ)
17. Ученый XXI века, 2016
18. AS Ilyasov, MM Ziyodullayev, Kalamushlarda to 'g 'ri ichak anal kanali tuzilishi va uning ksenobiotiklar ta'sirida o 'zgarishi, Science and Education, 2021