ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

CONTRAST-INDUCED NEPHROPATHY IN INTERVENTIONAL CARDIOLOGY AND ANGIOLOGY

Lutfullaev Oltin Oybekovich

Asian International University

Tel: +998911329697

oltinlutfullayev @ gmail . com

ABSTRACT: Cardiovascular diseases are the leading cause of death in industrialized countries. High-quality and accurate diagnostics, including cardiac and vascular imaging, are of great importance for adequate assessment, treatment, and prevention of cardiovascular diseases. Intravenous or intra-arterial administration of radiocontrast agents (or simply contrast agents) allows for precise determination of the vascular anatomy, the nature and localization of lesions in them, and assessment of the blood supply to various organs and tissues. Without such information, modern treatment would be simply impossible. Selective angiography and computed tomography with the introduction of contrast agents (CA) are used everywhere in practical medicine. Therefore, safety issues of examination or intervention using CA are of great importance. Despite significant progress in the development of CA, they have a number of adverse effects, including nephrotoxicity. Prevention of the nephrotoxic effect of CA, the so-called contrast-induced nephropathy (CIN), remains a pressing issue, since It is known that CIN is often a harbinger of chronic renal failure, which worsens the prognosis (McCullough, P. A. et al. 1997, Rihal, C. S. et al. 2002). Active use of X-ray computed tomography with intravenous administration of KB at the diagnostic stage increases not only the total radiation load, but also nephrotoxicity. Endovascular interventions, in which the risk of developing CIN is increased, are increasingly carried out in severely ill older patients with multifocal atherosclerosis, diabetes mellitus, arterial hypertension, heart failure, chronic kidney disease, etc. The interventions themselves are becoming more complex, often multi-stage, with the use of a large volume of KB. The dissertation is devoted to a topical issue - the prevention of CIN in patients who undergo endovascular interventions on the coronary and peripheral arteries.

CONCLUSIONS

KB are organic compounds containing a benzene ring and iodine atoms, and differ in chemical structure, in the number of ionized or non-ionized side chains. Differences in chemical structure determine chemotacticity during interaction of KB with organs and tissues. They also determine the physicochemical differences in KB in osmolarity and viscosity. The osmolarity of a solution is determined by the number of particles dissolved in it, respectively, the osmolarity of KB will be determined by the number of iodine atoms and osmolarly active ions. KB containing ionized residues have a significantly higher osmolarity than non-ionic KB. Large-molecular KB, on the contrary, are less osmolar, since they contain fewer molecules per unit volume. But solutions of large-molecular compounds are more viscous than low-molecular ones, since the viscosity of a solution is due to the property of fluid bodies to resist the movement of one of their parts relative to another. Accordingly, KB, the molecule of which contains two benzene rings - dimers, have a higher

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

viscosity, but lower osmolarity than monomeric KB, which include one benzene ring. Ionic KB of the previous generation, for example, meglumine diatrizoate (Urografin, Schering, Germany), were distinguished by high osmolarity, 5-6 times exceeding the osmolarity of plasma (Parfrey P.S. et al. 1989, Davidson S.J. et al. 1989, Rudnik M.R. et al. 1995) and when introduced into the vascular bed in large volumes, the osmolarity of plasma, which under normal conditions is a fairly constant value, quickly increases. Hyperosmolar plasma has a negative effect on renal function and can lead to transient acute renal dysfunction (Schwab S.J., et al. 1989, Cigarroa R.G. et al. 1989, Lautin E.M. et al. 1991). In contrast to high-osmolar first-generation KB, the osmolarity of modern non-ionic KB, such as Iogexol (Omnipaque, GE Healthcare, USA), Iopromide (Ultravist, Schering, Germany), Ioversol (Tyco Healthcare Group AG, Switzerland) is significantly lower (500 - 850 mcosmol/kg). Low-osmolar KB are less toxic to the kidneys and significantly less often than high-osmolar KB cause adverse reactions, including and renal dysfunction (Lautin E.M. et al. 1991. Rudnick M.R. et al. 1994, Barret B.J. ey al. 1994, Solomon et al. 1998). It was expected that CB with lower osmolarity (comparable to plasma osmolarity) could be even less toxic to the kidneys. These were the prerequisites for the creation of isoosmolar CB with osmolarity equal to plasma osmolarity (Aspelin P. et al. 2003). Today, the only isoosmolar nonionic CB used in practical medicine is the dimer Iodixanol (Visipaque, GE Healthcare, USA). The osmolarity of Iodixanol is 290 mCosmol/kg. However, as noted above, due to the dimeric structure of the Iodixanol molecule (two benzene rings), its viscosity is higher than that of other CB. And viscosity, according to some data, negatively affects renal function and the toxic effect on the kidneys is higher in more viscous KB (Schwab S.J., et al. 1989, Cigarroa R.G. et al. 1989, Lautin E.M. et al. 1991). Unfortunately, both low-osmolar and isoosmolar KB cause renal dysfunction (RD) in a certain category of patients. The ideal non-ionic KB, combining isoosmolarity with low viscosity and providing high-quality visualization, has not yet been synthesized.

REFERENCES

1. Samyeva , G., Narzulaeva , U., & Samiev , U. (2023). The course of arterial hypertension in residents of an arid region. Catalog monographs , 1(1), 1-108.
2. Narzullaeva , U., Samyeva , G., & Pardaeva , Z. (2020). PATHOPHYSIOLOGY OF MYOCARDIAL REPERFUSION INJURY. Journal Vestnik Vrachei, 1(2), 155-158.
3. Narzulaeva , U., Samyeva , G., & Nasirova , Sh. (2021). Hemorheological disorders in the early stages of hypertension in a hot climate. Journal Biomedicine and Practice , 1(1), 221-225.
4. Narzulaeva , U. R. (2023). ETIOPATHOGENESIS OF HEMOLYTIC ANEMIA. Web of Medicine: Journal of Medicine, Practice and Nursing, 1(1), 1-4.
5. Narzulaeva , U. R. (2023). ETIOPATHOGENESIS OF HEMOLYTIC ANEMIA. Web of Medicine: Journal of Medicine, Practice and Nursing, 1(1), 1-4.
6. Narzullaeva , U. R., Samieva , G. U., & Samiev , U. B. (2020). The importance of a healthy lifestyle in eliminating risk factors in the early stages of hypertension. Journal Of Biomedicine And Practice, 729-733.
7. Numonova , A., & Narzulayeva , U. (2023). EPIDEMIOLOGY AND ETIOPATHOGENESIS OF CHF. Science and Innovation , 1(15), 115-119.
8. Oripova , O. O., Samyeva , G. U., Khamidova , F. M., & Narzulaeva , U. R. (2020). The state of the distribution density of lymphoid cells of the laryngeal mucosa and

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

manifestations of local immunity in chronic laryngitis (analysis of autopsy material). Academy, (4 (55)), 83-86.

9. Abdurashitovich , ZF (2024). APPLICATION OF MYOCARDIAL CYTOPROTECTORS IN ISCHEMIC HEART DISEASES. *EDUCATION SCIENCE AND INNOVATIVE IDEAS IN THE WORLD* , *39* (5), 152-159.

10. Abdurashitovich , Z. F. (2024). ASTRAGAL O'SIMLIGINING TIBBIYOTDAGI MUHIM AHAMIYATLARI VA SOG'LOM TURMUSH TARZIGA TA'SIRI. *Best Intellectual Research* , *14* (4), 111-119.

11. Abdurashitovich , Z. F. (2024). MORPHO-FUNCTIONAL ASPECTS OF THE DEEP VEINS OF THE HUMAN BRAIN. *EDUCATION SCIENCE AND INNOVATIVE IDEAS IN THE WORLD* , *36* (6), 203-206.

12. Abdurashitovich , Z. F. (2024). THE RELATIONSHIP OF STRESS FACTORS AND THYMUS. *EDUCATION, SCIENCE AND INNOVATIVE IDEAS IN THE WORLD* , *36* (6), 188-196.

13. Abdurashitovich , Z. F. (2024). MIOKARD INFARKTI UCHUN XAVF OMILLARINING AHAMIYATINI ANIQLASH. *EDUCATION, SCIENCE AND INNOVATION IDEAS IN THE WORLD* , *36* (5), 83-89.

14. Rakhmatova , D. B., & Zikrillaev , F. A. (2022). DETERMINE THE VALUE OF RISK FACTORS FOR MYOCARDIAL INFARCTION. *FAN, TA'LIM, MADANIYAT VA INNOVATSIYA JURNALI| JOURNAL OF SCIENCE, EDUCATION, CULTURE AND INNOVATION* , *1* (4), 23-28.