

ABSTRACT&REFERENCES

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PREDICTION OF THE DEVELOPMENT OF ARTERIAL HYPOTENSION AT THE STROKE OF THE PATIENT ON STOMACH ON THE BACKGROUND OF SPINAL ANESTHESIA

p. 6-10

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When conducting spinal anesthesia (SA) in a position on the abdomen, arterial hypotension may occur, which is due to anesthesia and the effect of the position itself on the blood flow.

The aim of the work was the development of a prognostic model for changes in hemodynamics in vertebrologic operations in the abdomen on the background of spinal anesthesia.

Materials and methods. Postural blood circulation reactions were studied in 144 patients of the orthopedic profile operated in the abdominal position under spinal anesthesia: in the position on the back, after 5 and 20 minutes after turning on the stomach. Previously (one day before surgery) the same reactions were studied without anesthesia.

Results. In 16.0±3.1 % of patients during SA, hemodynamic correction with α_1 -adrenomimetics was required after rotation on the stomach. A randomized analysis of changes in hemodynamics before and during anesthesia revealed in these patients the stress of blood flow compensation, which was manifested when rotated to the abdomen without anesthesia in arterial hypertension and increased general peripheral vascular resistance. Under the influence of SA this compensation was suppressed, which led to instability of blood circulation. Significant risk of such a complication occurred in younger patients and with increased BMI. According to the results of the retrospective analysis, a mathematical model has been developed that allows calculating the prognostic index of hemodynamic instability (PING) and predicting hemodynamic instability during SA in the presence of abdominal patient. The PING value can range from infinitesimal to 1.

Conclusions: before conducting surgical interventions in the abdominal position under SA it is expedient to preoperatively study postural blood flow reactions with the calculation of PING. With PING>0.5 you should refrain from conducting CA and choose another kind of anesthesia.

Keywords: spinal anesthesia, hemodynamics, abdominal position, lumbar spine

References

1. Edgcombe, H., Carter, K., Yarrow, S. (2008). Anaesthesia in the prone position. *British Journal of Anaesthesia*, 100 (2), 165–183. doi: <http://doi.org/10.1093/bja/aem380>
2. Lessing, N. L., Edwards, C. C., Brown, C. H., Ledford, E. C., Dean, C. L., Lin, C., Edwards, C. C. (2016). Spinal Anesthesia in Elderly Patients Undergoing Lumbar Spine Surgery. *Orthopedics*, 40 (2), e317–e322. doi: <http://doi.org/10.3928/01477447-20161219-01>
3. Chinachoti, T., Tritrakarn, T. (2007). Prospective study of hypotension and bradycardia during spinal anesthesia with bupivacaine: incidence and risk factors, part two. *Journal of the Medical Association of Thailand*, 90 (3), 492–501.
4. Bible, J. E., Mirza, M., Knaub, M. A. (2018). Blood-loss Management in Spine Surgery. *Journal of the American Academy of Orthopaedic Surgeons*, 26 (2), 35–44. doi: <http://doi.org/10.5435/jaaos-d-16-00184>
5. Ławicka, M., Małek, A., Antczak, D., Wajlonis, A., Owczuk, R. (2015). Non-invasive haemodynamic measurements with Nexfin predict the risk of hypotension following spinal anaesthesia. *Anestezjologia Intensywna Terapia*, 47 (4), 303–308. doi: <http://doi.org/10.5603/ait.2015.0048>
6. Wu, C.-Y., Lee, T.-S., Chan, K.-C., Jeng, C.-S., Cheng, Y.-J. (2012). Does targeted pre-load optimisation by stroke volume variation attenuate a reduction in cardiac output in the prone position. *Anaesthesia*, 67 (7), 760–764. doi: <http://doi.org/10.1111/j.1365-2044.2012.07116.x>

7. Filho, G., Garcia, J., Goldschmidt, R., Mago, A., Cordeiro, M., Ceccato, F. (2001). Predictors of early hypotension during spinal anesthesia. *Revista Brasileira de Anestesiologia*, 51 (4), 298–304. doi: <http://doi.org/10.1590/s0034-70942001000400004>

8. Sakata, K., Yoshimura, N., Tanabe, K., Kito, K., Nagase, K., Iida, H. (2017). Prediction of hypotension during spinal anesthesia for elective cesarean section by altered heart rate variability induced by postural change. *International Journal of Obstetric Anesthesia*, 29, 34–38. doi: <http://doi.org/10.1016/j.ijoa.2016.09.004>

9. Behunov, A. A., Shyhaev, M. Yu., Shyhaev, Yu. H. (2010). Pat. No. 2383298 RU. Sposob prognozirovaniya potryebnosti korrrektsii gemodinamiki pri provedenii regionarnoi anestezii s klofelinom [Prognostic Method of Requirements of Hemodynamic Correction During Regional Anesthesia with Clonidine]. MPK: A61B 5/02, A61M 19/00, A61K31/4168, A61P 9/02. No. 2008142334/14; declared: 24.10.2008; published: 10.03.2010.

10. Lyzohub, M. V., Georgiyants, M. A., Vysotska, O. V., Porvan, A. P., Lyzohub, K. I. (2019). Pat. No. 131991 UA. Sposib prognozuvannya nespriyatlyvyh zmin hemodynamiky na phoni spinalnoi anestezii [Prognostic method of unfavourable hemodynamic changes during spinal anesthesia]. MPK: A61B 5/02. No. u 2018 08333; declared: 30.07.2018; published: 11.02.2019, Bul. No. 3.

11. Shimizu, M., Fujii, H., Yamawake, N., Nishizaki, M. (2015). Cardiac function changes with switching from the supine to prone position: Analysis by quantitative semiconductor gated single-photon emission computed tomography. *Journal of Nuclear Cardiology*, 22 (2), 301–307. doi: <http://doi.org/10.1007/s12350-014-0058-3>

12. Tabara, Y., Tachibana-Iimori, R., Yamamoto, M., Abe, M., Kondo, I., Miki, T., Kohara, K. (2005). Hypotension Associated with Prone Body Position: A Possible Overlooked Postural Hypotension. *Hypertension Research*, 28 (9), 741–746. doi: <http://doi.org/10.1291/hypres.28.741>

13. Hofhuizen, C., Lemson, J., Snoeck, M., Schefker, G.-J. (2019). Spinal anesthesia-induced hypotension is caused by a decrease in stroke volume in elderly patients. *Local and Regional Anesthesia*, 12, 19–26. doi: <http://doi.org/10.2147/lra.s193925>

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MULTIMODAL ANALGESIA FOR LAPAROSCOPIC OPERATIONS IN GYNECOLOGY

p. 10-15

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Adequate postoperative pain relief is an integral part of anesthesia management. Postsurgical pain can be treated effectively with both strong analgesics and prevention of central sensitization.

Objective: to evaluate the antinociceptive effect of the combined intraoperative use of ketamine and dexketoprofen after elective laparoscopic gynecological surgery.

Materials and methods: 80 females undergoing laparoscopic gynecological surgery with total intravenous anesthesia (TIVA) with propofol and fentanyl. Patients were randomly assigned into three groups depending on multimodal analgesia choice, matched by age, and the nature of surgical intervention. Demographic characteristics, anthropometric data, functional status, duration of surgery and anesthesia were similar in all groups. Group I patients (n=30) received TIVA with mechanical ventilation. Group II patients (n=25) received TIVA with additional administration of subanesthetic doses of ketamine. Group III patients (n=25) received TIVA with additional administration of subanesthetic doses of ketamine and a single administration of 50 mg of dexketoprofen 30 minutes before the end of the surgery. The intensity of postoperative pain was evaluated by VAS at 1, 2, 6, 12 and 24 hours after surgery. Time of the first analgesic administration and the incidence of side effects were recorded.

Results: Estimates of the intensity of pain according to VAS at rest and on movement during the first 12 hours after surgery were significantly higher in group I compared with groups II and III ($p < 0.05$). 1 hour after surgery the level of pain at rest and on movement was significantly higher in group II patients than in group III. The need for additional administration of analgesics after surgery was 53.3 % for Group I, 40 % for Group II, and 28 % for Group III.

Conclusions: Traditional general anesthesia (TIVA with propofol and fentanyl with mechanical ventilation) does not prevent moderate to severe postoperative pain in most patients. Intraoperative use of subanesthetic doses of ketamine reduces postoperative pain in early stages after laparoscopic gynecological surgery. Combined intraoperative use of low doses of ketamine (up to 0,5 mg/kg) and dexketoprofen (50 mg) provides the most effective analgesia during the first 12 hours after laparoscopic gynecological surgery, delays first injection of analgesics and reduces need for additional analgesics prescription

Keywords: postoperative pain, multimodal analgesia, ketamine, dexketoprofen

References

1. Garimella, V., Cellini, C. (2013). Postoperative Pain Control. *Clinics in Colon and Rectal Surgery*, 26 (3), 191–196. doi: <http://doi.org/10.1055/s-0033-1351138>

2. Gehdoo, R. P. (2004). Post operative pain management in paediatric patient. *Indian Journal of Anaesthesia*, 48 (5), 406–414.

3. Aasvang, E. K., Gmaehle, E., Hansen, J. B., Gmaehle, B., Forman, J. L., Schwarz, J. et. al. (2010). Predictive Risk Factors

for Persistent Postherniotomy Pain. *Anesthesiology*, 112 (4), 957–969. doi: <http://doi.org/10.1097/aln.0b013e3181d31ff8>

4. Brandsborg, B., Nikolajsen, L., Hansen, C. T., Kehlet, H., Jensen, T. S. (2007). Risk Factors for Chronic Pain after Hysterectomy. *Anesthesiology*, 106 (5), 1003–1012. doi: <http://doi.org/10.1097/01.anes.0000265161.39932.e8>

5. Butala, B., Shah, V., Nived, K. (2013). Randomized double blind trial of intraperitoneal instillation of bupivacaine and morphine for pain relief after laparoscopic gynecological surgeries. *Saudi Journal of Anaesthesia*, 7 (1), 18–23. doi: <http://doi.org/10.4103/1658-354x.109800>

6. Radresa, O., Chauny, J.-M., Lavigne, G., Piette, E., Paquet, J., Daoust, R. (2014). Current views on acute to chronic pain transition in post-traumatic patients. *Journal of Trauma and Acute Care Surgery*, 76 (4), 1142–1150. doi: <http://doi.org/10.1097/ta.000000000000188>

7. Bauchat, J. R., Habib, A. S. (2015). Evidence-Based Anesthesia for Major Gynecologic Surgery. *Anesthesiology Clinics*, 33 (1), 173–207. doi: <http://doi.org/10.1016/j.anclin.2014.11.011>

8. Nelson, G., Kalogera, E., Dowdy, S. C. (2014). Enhanced recovery pathways in gynecologic oncology. *Gynecologic Oncology*, 135 (3), 586–594. doi: <http://doi.org/10.1016/j.ygyno.2014.10.006>

9. Nir, R.-R., Nahman-Averbuch, H., Moont, R., Sprecher, E., Yarnitsky, D. (2016). Preoperative preemptive drug administration for acute postoperative pain: A systematic review and meta-analysis. *European Journal of Pain*, 20 (7), 1025–1043. doi: <http://doi.org/10.1002/ejp.842>

10. Bacchi, S., Palumbo, P., Sponta, A., Coppolino, M. F. (2012). Clinical Pharmacology of Non-Steroidal Anti-Inflammatory Drugs: A Review. *Anti-Inflammatory & Anti-Allergy Agents in Medicinal Chemistry*, 11 (1), 52–64. doi: <http://doi.org/10.2174/187152312803476255>

11. Samad, T. A., Saperstein, A., Woolf, C. J. (2002). Prostanoids and pain: unraveling mechanisms and revealing therapeutic targets. *Trends in Molecular Medicine*, 8 (8), 390–396. doi: [http://doi.org/10.1016/s1471-4914\(02\)02383-3](http://doi.org/10.1016/s1471-4914(02)02383-3)

12. Zidar, N., Odar, K., Glavac, D., Jerse, M., Zupanc, T., Stajer, D. (2008). Cyclooxygenase in normal human tissues – is COX-1 really a constitutive isoform, and COX-2 an inducible isoform? *Journal of Cellular and Molecular Medicine*, 13 (9b), 3753–3763. doi: <http://doi.org/10.1111/j.1582-4934.2008.00430.x>

13. Consalvi, S., Biava, M., Poce, G. (2015). COX inhibitors: a patent review (2011 – 2014). *Expert Opinion on Therapeutic Patents*, 25 (12), 1357–1371. doi: <http://doi.org/10.1517/13543776.2015.1090973>

14. McRoberts, J. A., Coutinho, S. V., Marvizón, J. C. G., Grady, E. F., Tognetto, M., Sengupta, J. N. et. al. (2001). Role of peripheral N-methyl-D-aspartate (NMDA) receptors in visceral nociception in rats. *Gastroenterology*, 120 (7), 1737–1748. doi: <http://doi.org/10.1053/gast.2001.24848>

15. De Kock, M. F., Lavand'homme, P. M. (2007). The clinical role of NMDA receptor antagonists for the treatment of postoperative pain. *Best Practice & Research Clinical Anaesthesiology*, 21 (1), 85–98. doi: <http://doi.org/10.1016/j.bpa.2006.12.006>

16. De Kock, M., Lavand'homme, P., Waterloos, H. (2001). “Balanced analgesia” in the perioperative period: is there a place for ketamine? *Pain*, 92 (3), 373–380. doi: [http://doi.org/10.1016/s0304-3959\(01\)00278-0](http://doi.org/10.1016/s0304-3959(01)00278-0)

17. Visser, E., Schug, S. A. (2006). The role of ketamine in pain management. *Biomedicine & Pharmacotherapy*, 60 (7), 341–348. doi: <http://doi.org/10.1016/j.biopha.2006.06.021>

18. Carstensen, M., Moller, A. M. (2010). Adding ketamine to morphine for intravenous patient-controlled analgesia for acute postoperative pain: a qualitative review of randomized trials. *British Journal of Anaesthesia*, 104 (4), 401–406. doi: <http://doi.org/10.1093/bja/aeq041>

19. Himmelseher, S., Durieux, M. E. (2005). Ketamine for Perioperative Pain Management. *Anesthesiology*, 102 (1), 211–220. doi: <http://doi.org/10.1097/00000542-200501000-00030>

20. Vosoughin, M., Mohammadi, S., Dabbagh, A. (2012). Intravenous ketamine compared with diclofenac suppository in suppressing acute postoperative pain in women undergoing gynecologic laparoscopy. *Journal of Anesthesia*, 26 (5), 732–737. doi: <http://doi.org/10.1007/s00540-012-1399-1>

21. Siddiqui, K., Khan, F. (2015). Effect of preinduction low-dose ketamine bolus on intra operative and immediate postoperative analgesia requirement in day care surgery: A randomized controlled trial. *Saudi Journal of Anaesthesia*, 9 (4), 422–427. doi: <http://doi.org/10.4103/1658-354x.159468>

22. Johansen, A., Romundstad, L., Nielsen, C. S., Schirmer, H., Stubhaug, A. (2012). Persistent postsurgical pain in a general population: Prevalence and predictors in the Tromsø study. *Pain*, 153 (7), 1390–1396. doi: <http://doi.org/10.1016/j.pain.2012.02.018>

23. Brinck, E. C., Tiippana, E., Heesen, M., Bell, R. F., Straube, S., Kontinen, V. (2016). Perioperative intravenous ketamine for acute postoperative pain in adults. *Cochrane Database of Systematic Reviews*. doi: <http://doi.org/10.1002/14651858.cd012033>

24. Radvansky, B. M., Shah, K., Parikh, A., Sifonios, A. N., Le, V., Eloy, J. D. (2015). Role of Ketamine in Acute Postoperative Pain Management: A Narrative Review. *BioMed Research International*, 2015, 1–10. doi: <http://doi.org/10.1155/2015/749837>

25. Stubhaug, A., Breivik, H., Eide, P. K., Kreunen, M., Foss, A. (1997). Mapping of punctuate hyperalgesia around a surgical incision demonstrates that ketamine is a powerful suppressor of central sensitization to pain following surgery. *Acta Anaesthesiologica Scandinavica*, 41 (9), 1124–1132. doi: <http://doi.org/10.1111/j.1399-6576.1997.tb04854.x>

26. Mion, G. (2017). Is it time to cease the single low-dose ketamine injection at induction of anesthesia? *Acta Anaesthesiologica Scandinavica*, 61 (10), 1377–1378. doi: <http://doi.org/10.1111/aas.12996>

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COMPARATIVE EVALUATION OF CHANGES IN LIPID PROLINE IN PATIENTS WITH Q-MYOCARDIAL INFARCTION COMPLICATED BY ACUTE HEART FAILURE WITH CARBOHYDRATE METABOLISM DISORDERS

p. 16-22

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The aim was to study the characteristics of lipid metabolism disorders, its pathogenic significance and changes under the influence of lipid-lowering therapy in patients with acute Q-MI, complicated by acute heart failure against different types of hyperglycemia.

Materials and methods. There were surveyed 113 patients with acute Q-IM, complicated by acute heart failure against normoglycemia (n=26), hyperglycemia on admission (n=66), type 2 diabetes history (n=21) and 21 practically healthy individuals. After examining patients with hyperglycemia on admission, the following subgroups were distinguished: stress hyperglycemia (n=25), impaired glucose tolerance (IGT) (n=22), new-onset type 2 diabetes (n=19). Patients were determined the lipid profile, insulin level and insulin resistance index (HOMA-IR). For evaluating the effectiveness of the drug lipid-lowering therapy in patients with hyperglycemia on admission, there was conducted subanalysis by the drugs: atorvastatin subgroup – 31 patients (median age 66 (60; 79) years), average daily dose of 21.7±1.1 mg per os, rosuvasatin subgroup - 35 patients (median age 66 (56; 77) years), the average daily dose of 12.8±0.6 mg per os.

Results. Compared with the normoglycemia group, the HDL level on the first day was lower by 22 % (p=0.02) in the hyperglycemia on admission group, by 29 % (p=0.005) in patients with IGT and by 33 % (p=0.042) in patients with diabetes mellitus in history, the level of triglycerides – by 15 % (p=0.03) in the IGT subgroup. In the stress hyperglycemia subgroup, the level of total cholesterol on day 12 was higher by 21 % (p=0.027), and triglycerides by 26 % (p=0.043). In patients with hyperglycemia on admission HOMA-IR was 2.11 times higher (p=0.04), in patients with IGT 2.94 times (p=0.02), with new-onset type 2 diabetes 2.91 times higher (p=0.006) compared with normoglycemia. The level of total cholesterol in the atorvastatin subgroup decreased by 21 % (p=0.002), and in the subgroup of rosuvasatin by 11 % (p=0.0005); the level of LDL by 19 % (p=0.0005) and 17 % (p=0.0005), respectively.

Conclusions. The lipid profile of patients with type 2 diabetes mellitus in history was characterized by the greatest atherogenic potential. The highest HOMA-IR is registered in the IGT group. The best dynamics of lipid profile was found in patients with normoglycemia. The patients with hyperglycemia on admission, that were receiving atorvastatin, had greater reduction in total and LDL cholesterol levels, than patients, that were receiving rosuvasatin

Keywords: Q-myocardial infarction, acute heart failure, hyperglycemia on admission, lipid profile, insulin resistance

References

1. Kovalenko, V. M., Kornatsky, V. M. (2013). Rehion-al'ni medyko-sotsial'ni problemy khvorob systemy krovoobihu.

Dynamika ta analiz [Regional medical and social problems of circulatory system diseases. Dynamics and analysis]. Kyiv, 240.

2. Ametov, A. S., Pugovkina, Ya. V., Chernikova, N. A. (2016). Upravleniye giperglikemiyey pri ostrom koronarnom sindrome. Problemy i resheniye [Management of hyperglycemia in acute coronary syndrome. Problems and solution]. Medical Council, 3, 98–105.

3. Burke, A. P., Butany, J. (2015). Pathology of Acute Myocardial Infarction. Medscape. Available at: <https://emedicine.medscape.com/article/1960472-overview#showall>

4. Dzhaiani, N. A. (2014). Primeneniye statinov pri ostrom koronarnom sindrome. Pozitsii rozuvasatina [The use of statins in acute coronary syndrome. Positions of rosuvasatin]. RMJ “Medical Review”, 18, 1345.

5. Chapman, M. J., Ginsberg, H. N., Amarenco, P., Andreotti, F., Borén, J. et. al. (2011). Triglyceride-rich lipoproteins and high-density lipoprotein cholesterol in patients at high risk of cardiovascular disease: evidence and guidance for management. European Heart Journal, 32 (11), 1345–1361. doi: <http://doi.org/10.1093/eurheartj/ehr112>

6. The Task Force on the management of stable coronary artery disease of the European Society of Cardiology. 2013 ESC guidelines on the management of stable coronary artery disease. European Heart Journal. 2013. Vol. 34, Issue 38. P. 2949–3003. doi: <http://doi.org/10.1093/eurheartj/ehs296>

7. Ramirez, A., Hu, P. P. (2015). Low High-Density Lipoprotein and Risk of Myocardial Infarction. Clinical Medicine Insights: Cardiology, 9, 113–117. doi: <http://doi.org/10.4137/cmc.s26624>

8. Sorokyna, E. Yu. (2015). Ctress-yndutsyrovannaya hyperhlykemyya pry krytycheskykh sostoyannyakh: kontsept-syia metabolycheskoy terapii [Stress-induced hyperglycemia during critical status The concept of metabolic therapy]. Pain, anesthesia and intensive care, 3, 9–23

9. Matthews, V. B., Allen, T. L., Risis, S., Chan, M. H. S., Henstridge, D. C., Watson, N. et. al. (2010). Interleukin-6-deficient mice develop hepatic inflammation and systemic insulin resistance. Diabetologia, 53 (11), 2431–2441. doi: <http://doi.org/10.1007/s00125-010-1865-y>

10. Arnold, S. V., Lipska, K. J., Li, Y., McGuire, D. K., Goyal, A., Spertus, J. A., Kosiborod, M. (2014). Prevalence of glucose abnormalities among patients presenting with an acute myocardial infarction. American Heart Journal, 168 (4), 466–470. doi: <http://doi.org/10.1016/j.ahj.2014.06.023>

11. Moghissi, E. S., Korytkowski, M. T., DiNardo, M., Einhorn, D., Hellman, R., Hirsch, I. B. et. al. (2009). American Association of Clinical Endocrinologists and American Diabetes Association Consensus Statement on Inpatient Glycemic Control. Diabetes Care, 32 (6), 1119–1131. doi: <http://doi.org/10.2337/dc09-9029>

12. Report of a WHO/IDF consultation. Definition and diagnosis of diabetes and intermediate hyperglycaemia (2006). Available at: https://www.who.int/diabetes/publications/diagnosis_diabetes2006/en/

13. Unifikovanyy klinichnyy protokol ekstrenoyi, pervynnoyi, vtorynnoyi (spetsializovanoi) ta tretynnoyi (vysokospetsializovanoi) dopomohy khvorym na hostryy koronarnyy syndrom z elevatsiyeyu sehmenta ST [Unified clinical protocol of emergency, primary, secondary (specialized) and tertiary

(highly specialized) assistance to patients with acute coronary syndrome with elevation of segment ST] (2014). Order of the Ministry of Health of Ukraine No. 455. 02.07.2014. Available at: <https://zakon.rada.gov.ua/rada/show/v0455282-14#n17>

14. Mansour, A. A., Wanoose, H. L. (2011). Acute Phase Hyperglycemia among Patients Hospitalized with Acute Coronary Syndrome: Prevalence and Prognostic Significance. *Oman Medical Journal*, 26 (2), 85–90. doi: <http://doi.org/10.5001/omj.2011.22>

15. Byl'yeva, A. A. (2012). Osobennosti techeniya ostrogo koronarnogo sindroma u patsiyentov s metabolicheskim sindromom [Features of the course of acute coronary syndrome in patients with metabolic syndrome]. Moscow, 28.

16. Ladeira, R. T., Baracioli, L. M., Faulin, T. E. S., Abdalla, D. S. P., Seydell, T. M., Maranhão, R. C. et. al. (2013). Unrecognized diabetes and myocardial necrosis: predictors of hyperglycemia in myocardial infarction. *Arquivos Brasileiros de Cardiologia*, 100 (5). doi: <http://doi.org/10.5935/abc.20130087>

17. Rachek, L. I. (2014). Free Fatty Acids and Skeletal Muscle Insulin Resistance. Glucose Homeostasis and the Pathogenesis of Diabetes Mellitus, 121, 267–292. doi: <http://doi.org/10.1016/b978-0-12-800101-1.00008-9>

18. Barter, P. J., Rye, K.-A., Tardif, J.-C., Waters, D. D., Boekholdt, S. M., Breazna, A., Kastelein, J. J. P. (2011). Effect of Torcetrapib on Glucose, Insulin, and Hemoglobin A 1c in Subjects in the Investigation of Lipid Level Management to Understand its Impact in Atherosclerotic Events (ILLUMINATE) Trial. *Circulation*, 124 (5), 555–562. doi: <http://doi.org/10.1161/circulationaha.111.018259>

19. Perk, J., De Backer, G., Gohlke, H., Graham, I., Reiner, Z., Verschuren, M. et. al. (2012). European guidelines on cardiovascular disease prevention in clinical practice (version 2012): the fifth joint task force of the European society of cardiology and other societies on cardiovascular disease prevention in clinical practice (constituted by representatives of nine societies and by invited experts). *European Heart Journal*, 33 (13), 1635–1701. doi: <http://doi.org/10.1093/eurheartj/ehs092>

20. Cannon, C. P., Braunwald, E., McCabe, C. H., Rader, D. J., Rouleau, J. L., Belder, R. et. al. (2004). Intensive versus Moderate Lipid Lowering with Statins after Acute Coronary Syndromes. *New England Journal of Medicine*, 350 (15), 1495–1504. doi: <http://doi.org/10.1056/nejmoa040583>

21. O'Gara, P. T., Kushner, F. G., Ascheim, D. D., Casey, D. E. et. al. (2013). 2013 ACCF/AHA Guideline for the Management of ST-Elevation Myocardial Infarction A Report of the American College of Cardiology Foundation. American Heart Association Task Force on Practice Guidelines. *Circulation*, 127 (4), 362–425. doi: <http://doi.org/10.1161/cir.0b013e3182742cf6>

22. Susekov, A. V., Gornyakova, N. B., Boytsov, S. A. (2010). Zavershennyye klinicheskiye issledovaniya s rozuvastatinom iz proyekta GALAKTIKA [Completed clinical studies with rosuvastatin from the GALAXY project]. *Heart and vascular diseases*, 2, 26–36.

23. Kovaleva, Yu. V., Chavdar, F. N., Ryzhkova, N. V., Maslov, A. P. et. al. (2014). Ispol'zovaniye atorvastatina i rozuvastatina v klinicheskoy praktike u patsiyentov vysokogo riska. terapiya-kardiologiya-nevrologiya [Use of atorvastatin and rosuvastatin in clinical practice in high-risk patients]. *Medicine in Kuzbass*, 3, 47–50.

24. Ballantyne, C. M., Pitt, B., Loscalzo, J., Cain, V. A., Raichlen, J. S. (2013). Alteration of Relation of Atherogenic Lipoprotein Cholesterol to Apolipoprotein B by Intensive Statin Therapy in Patients With Acute Coronary Syndrome (from the Limiting UNDertreatment of lipids in ACS With Rosuvastatin [LUNAR] Trial). *The American Journal of Cardiology*, 111 (4), 506–509. doi: <http://doi.org/10.1016/j.amjcard.2012.10.037>

25. Luo, J., Li, J., Shen, X., Hu, X., Fang, Z., Lv, X., Zhou, S. (2013). The effects and mechanisms of high loading dose rosuvastatin therapy before percutaneous coronary intervention in patients with acute coronary syndrome. *International Journal of Cardiology*, 167 (5), 2350–2353. doi: <http://doi.org/10.1016/j.ijcard.2012.11.032>

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STRUCTURAL-FUNCTIONAL FEATURES OF THE HEART IN PATIENTS WITH ACUTE Q-MYOCARDIAL INFARCTION OF THE ANTERIOR WALL OF THE LEFT VENTRICLE IN THE PRESENCE OF PULMONARY HYPERTENSION

p. 23-27

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The aim was to evaluate the structural and functional features of the heart in the acute myocardial infarction (AMI) of the anterior wall of the left ventricle (LV) in the presence of pulmonary hypertension (PH) for the development of more informative diagnostic markers, forecast predictors and improved treatment of patients.

Materials and methods. A total of 90 patients (53 men and 37 women) with acute myocardial infarction of the anterior wall of the LV (AMI AV) were examined in the intensive care unit for acute coronary insufficiency of the Communal Non-profit Enterprise “City Emergency and Ambulance Hospital” of the Zaporizhzhya City Council. Patients were divided into two groups: 55 patients with AMI AV with PH (mean age 70.65±1.83 years), 35 patients with AMI AV without PH (mean age 66.80±2.02 years). For all patients in the first three days after hospitalization, two-dimensional echocardiography was performed on the device “MyLab50” (“Esaote”, Italy) according to the recommendations of the American Society of Echocardiography. For statistical data processing, statistical software package “Statistica 6.0 for Windows” (StatSoft Inc., No. AXXR712D833214FAN5) was used. The reliability of the differences in the groups was evaluated using the dual t-criterion of the Student for independent samples. To assess the convergence of the indicators, the χ^2 criterion, corrected by Yeats,

was determined. The reliability of the differences between the indices was confirmed at $p < 0.05$.

Results. In patients with AMI AV with PH in comparison with patients with AMI AV without PH, there was a significant decrease in ejection fraction (22.3 %; $p < 0.05$), increase in myocardial mass index (by 18.3 %, $p < 0.05$) and end systolic diameter of left ventricle (12.4 %; $p < 0.05$), dilatation of left atrium (by 11.6 % ($p < 0.05$), right ventricle (by 27.3 %, $p < 0.05$) and right atrium (by 20, 9 %; $p < 0.05$). In assessing the types of remodeling of the of left ventricle, it was found that in patients with AMI AV with PH was predominantly eccentric hypertrophy (90.9 %), which is significantly higher in comparison with the AMI AV without PH.

Patients with AMI AV and PH have a significant acceleration peak E of mitral valve (by 34.4 %; $p < 0.05$), an increase in the ratio E/A of mitral valve (by 61.1 %, $p < 0.05$), the time of isovolumetric relaxation LV extension (on 13.9 %; $p < 0.05$) and acceleration peak E of tricuspidal valve E (by 28.3 %, $p < 0.05$) in comparison with patients without PH. According to the data of tissue dopplerography, patients with AMI AV and PH showed an increasing ratio E/E' of mitral valve (MV E/E') (by 46.5 %; $p < 0.05$) and ratio E/E' of tricuspidal valve (TV E/E') (by 39.3 %; $p < 0.05$) compared with patients without PH. In patients with AMI AV and PH there was a predominant type of diastolic dysfunction (40 % of cases), type of diastolic dysfunction with disturbance of relaxation (71.4 %) predominated in the group of AMI AV without PH.

Conclusions. In patients with AMI AV pulmonary hypertension develops against the background of dilation of the left chambers of the heart with the formation of eccentric hypertrophy and systolic dysfunction of the left ventricle, overloading of the right chambers of the heart with an increase in the size of the right atrium and left ventricle. Patients with AMI AV with PH had a predominantly pseudonormal type of LV diastolic dysfunction with an increase in MV E/E' ratio and diastolic dysfunction of right ventricle, as evidenced by an increase in the ratio of TV E/E'

Keywords: Q-myocardial infarction, pulmonary hypertension, anterior wall of left ventricle, diastolic dysfunction

References

- Kovalenko, V. M., Lutai, M. I., Sirenko, Yu. M. et. al. (2016). Sertsevo-sudynni zakhvoriuvannia. Klasyfikatsiia, standarty diahnozyky ta likuvannia. Kyiv: Asotsiatsiia kardiologiv Ukrainy, 128.
- Galiè, N., Humbert, M., Vachiery, J.-L., Gibbs, S., Lang, I., Torbicki, A. et. al. (2016). 2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension: The Joint Task Force for the Diagnosis and Treatment of Pulmonary Hypertension of the European Society of Cardiology (ESC) and the European Respiratory Society (ERS): Endorsed by: Association for European Paediatric and Congenital Cardiology (AEPC), International Society for Heart and Lung Transplantation (ISHLT). *European Heart Journal*, 37 (1), 67–119. doi: <http://doi.org/10.1093/eurheartj/ehv317>
- Ahsan, S., Hamed, S., Dehkordi, H., Wen, Y., Lee, S., Gholitabar, F. et. al. (2018). The Impact of Pulmonary Hypertension on In-Hospital Outcomes of Non-St Elevation Myocardial Infarction. *Journal of the American College of Cardiology*, 71 (11), 1940. doi: [http://doi.org/10.1016/s0735-1097\(18\)32481-1](http://doi.org/10.1016/s0735-1097(18)32481-1)
- Guazzi, M., Borlaug, B. A. (2012). Pulmonary Hypertension Due to Left Heart Disease. *Circulation*, 126 (8), 975–990. doi: <http://doi.org/10.1161/circulationaha.111.085761>
- Mehra, P., Mehta, V., Sukhija, R., Sinha, A. K., Gupta, M., Girish, M. P., Aronow, W. S. (2019). Pulmonary hypertension in left heart disease. *Archives of Medical Science*, 15 (1), 262–273. doi: <http://doi.org/10.5114/aoms.2017.68938>
- Nartaeva, A. E., Alshirieva, U. A., Nurakhunov, R. A. (2013). Chastota, oslozhnieniia i morfologicheskaiia kharakteristika infarkta miokarda. *Vestnik KazNMU*, 2, 239–241.
- Sivolap, V. D., Kiselov, S. M. (2013). Prediktory razvitiia anevrizmy levogo zheludochka u bolnykh ostrym perednim Q-infarktom miokarda. *Patologiya*, 2 (28), 45–48.
- Lang, R. M., Badano, L. P., Mor-Avi, V., Afilalo, J., Armstrong, A., Ernande, L. et. al. (2015). Recommendations for Cardiac Chamber Quantification by Echocardiography in Adults: An Update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. *Journal of the American Society of Echocardiography*, 28 (1), 1–39. doi: <http://doi.org/10.1016/j.echo.2014.10.003>
- Nagueh, S. F., Smiseth, O. A., Appleton, C. P., Byrd, B. F., Dokainish, H., Edvardsen, T. et. al. (2016). Recommendations for the Evaluation of Left Ventricular Diastolic Function by Echocardiography: An Update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. *Journal of the American Society of Echocardiography*, 29 (4), 277–314. doi: <http://doi.org/10.1016/j.echo.2016.01.011>
- Drozdova, I. V. (2017). Features of structural and functional state of the heart in patients with chronic heart failure with comorbid hypertension. *Zaporozhye Medical Journal*, 19 (3 (102)), 257–260. doi: <http://doi.org/10.14739/2310-1210.2017.3.100575>
- Mutlak, D., Lessick, J., Carasso, S., Kapeliovich, M., Dragu, R., Hammerman, H. et. al. (2012). Utility of Pulmonary Hypertension for the Prediction of Heart Failure Following Acute Myocardial Infarction. *The American Journal of Cardiology*, 109 (9), 1254–1259. doi: <http://doi.org/10.1016/j.amjcard.2011.12.035>

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TREATMENT OF PATIENTS WITH ACUTE CORONARY SYNDROME AND ATRIAL FIBRILLATION

p. 28-36

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The aim was to study the possible protective effect of drug therapy regarding the development of AF in patients with ACS and compliance with the standards of treatment of these patients in everyday clinical practice.

Materials and research methods. A study was conducted of 125 patients with ACS who were hospitalized with ACS to the

center of percutaneous coronary interventions of the KNP of the Kharkiv Regional Council "Regional Clinical Hospital" for four years from 2015–2018, among which 65 had atrial fibrillation. The criterion for inclusion in the study was the presence of ACS; exclusion criteria were the presence of severe concomitant diseases (active oncological processes, chronic IV degree renal failure, etc.), heart defects, and the patient's refusal to participate in the study. In accordance with the Helsinki Declaration, all patients were informed about the aim, methods and design of the study and gave their consent to participate.

Patients were divided into groups according to the presence of AF. In group 1, patients with AF were combined, and patients who had AF for the first time during hospitalization for ACS were subgroup 1a (n=41); patients in whom AF was observed before the development of ACS were subgroup 1b (n=24). The second group consisted of patients without indications of AF in the history and during hospitalization (n=60).

Results. The majority of patients of the 1st group, namely, 92.3 %, had three or more points on the CHA2DS2-VASc scale of thromboembolic complications, while the greatest number of patients (n=41, 63 %) with ACS and AF were 4-5 points on the scale of risk of thromboembolic complications according to CHA2DS2-VASc. Most patients had a score of 0-1 on the bleeding risk scale. When evaluating drug therapy in patients with ACS, it was found that acetylsalicylic acid was administered to almost all patients with ACS, except for patients with concomitant bronchial asthma. The majority of patients with ACS, with or without concomitant AF, received clopidogrel as a double antiplatelet therapy along with acetylsalicylic acid. Anticoagulant therapy with the use of warfarin and new oral anticoagulants was more often prescribed to patients with 1b subgroups. Calcium antagonists were more frequently prescribed in patients of the 2nd group compared with the 1st (n1=4; 6.2 % vs n2=12; 20.0 %, p=0.0228). Statins were administered to hospitals in almost all patients, except for a few patients with intact coronary vessels. Prehospital administration of the loading dose of the P2Y12 inhibitor was more frequently recorded in the 1st group of patients as compared with the 2nd (n1=26; 40.0 % vs n2=13; 21.7 %, p=0.0292), at the same time among patients with 1a-subgroups with AF, which appeared for the first time, a significantly rarer prescription of the pre-hospital loading dose of the P2Y12 inhibitor was observed compared with the 1b-subgroup (n1a=11; 26.8 % vs n1b=15; 62.5 %, p=0, 0061). The majority of patients in all groups received ACE inhibitors / ARBs in basic therapy during the hospital period. The prescription of diuretics was more often registered among patients of the 1b-subgroup, which indicates a more severe course of CHF in this group of patients, which preceded the development of ACS. An increase in the frequency of triple therapy prescriptions among patients with AF over the years 2015–2018 was found, which corresponds to the existing modern standards of medical care regarding the appointment of combination anticoagulant and anti-platelet therapy to patients with AF and ACS. Unassigned triple therapy in the group of patients with AF, which originated for the first time, is associated with a greater frequency of registration of anemia in this group of patients.

Conclusion. In accordance with the results of the study, all patients with ACS and AF have a high thromboembolic risk and require anti-coagulant therapy. In everyday clinical practice, in

the discharge of patients with ACS and AF from hospital more than a third (38.1 %) patients are not recommended anticoagulant therapy, which does not comply with current recommendations. At the same time, patients are more often prescribed therapy who had AF before the development of ACS, while patients in subgroup 1a who have AF demonstrated in the acute period have less than half. In a retrospective analysis of extracts of case histories over the period 2015–2018, an increase in the frequency of triple therapy prescriptions among patients with AF was found. The most common cause of non-prescribing anticoagulants is anemia and a high risk of bleeding.

Keywords: anticoagulant therapy, antiplatelet therapy, dual therapy, triple therapy, atrial fibrillation, acute coronary syndrome

References

1. Tseluiko, V. I.; Tseluiko, V. I. (Ed.) (2014). Spravochnik po kardiologii. Kyiv: Zdorove Ukrainy, 542.
2. Batra, G., Svennblad, B., Held, C., Jernberg, T., Johanson, P., Wallentin, L., Oldgren, J. (2016). All types of atrial fibrillation in the setting of myocardial infarction are associated with impaired outcome. *Heart*, 102 (12), 926–933. doi: <http://doi.org/10.1136/heartjnl-2015-308678>
3. Van den Berg, N. W. E., de Groot, J. R. (2015). Myocardial infarction, atrial fibrillation and mortality: timing is everything. *Netherlands Heart Journal*, 23 (9), 428–429. doi: <http://doi.org/10.1007/s12471-015-0710-9>
4. Chao, T.-F., Huang, Y.-C., Liu, C.-J., Chen, S.-J., Wang, K.-L., Lin, Y.-J. et. al. (2014). Acute myocardial infarction in patients with atrial fibrillation with a CHA2DS2-VASc score of 0 or 1: A nationwide cohort study. *Heart Rhythm*, 11 (11), 1941–1947. doi: <http://doi.org/10.1016/j.hrthm.2014.08.003>
5. Kea, B., Manning, V., Allgood, T., Raitt, M. (2016). A Review of the Relationship of Atrial Fibrillation and Acute Coronary Syndrome. *Current Emergency and Hospital Medicine Reports*, 4 (3), 107–118. doi: <http://doi.org/10.1007/s40138-016-0105-2>
6. Heidbuchel, H., Verhamme, P., Alings, M., Antz, M., Hacke, W., Oldgren, J. et. al. (2013). EHRA Practical Guide on the use of new oral anticoagulants in patients with non-valvular atrial fibrillation: executive summary†. *European Heart Journal*, 34 (27), 2094–2106. doi: <http://doi.org/10.1093/eurheartj/ehf134>
7. Heidbuchel, H., Verhamme, P., Alings, M., Antz, M., Diener, H.-C., Hacke, W. et. al. (2015). Updated European Heart Rhythm Association Practical Guide on the use of non-vitamin K antagonist anticoagulants in patients with non-valvular atrial fibrillation. *Europace*, 17 (10), 1467–1507. doi: <http://doi.org/10.1093/europace/euv309>
8. January, C. T., Wann, L. S., Alpert, J. S., Calkins, H., Cigarroa, J. E., Cleveland, J. C. et. al. (2014). AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society. *Journal of the American College of Cardiology*, 64 (21), 2246–2280. doi: <http://doi.org/10.1016/j.jacc.2014.03.021>
9. Kirchhof, P., Benussi, S., Kotecha, D., Ahlsson, A., Atar, D., Casadei, B. et. al. (2016). ESC Scientific Document Group; 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS. *European*

Heart Journal, 37 (38), 2893–2962. doi: <http://doi.org/10.1093/eurheartj/ehw210>

10. Cannon, C. P., Bhatt, D. L., Oldgren, J., Lip, G. Y. H., Ellis, S. G., Kimura, T. et. al. (2017). Dual Antithrombotic Therapy with Dabigatran after PCI in Atrial Fibrillation. *New England Journal of Medicine*, 377 (16), 1513–1524. doi: <http://doi.org/10.1056/nejmoa1708454>

11. Bencivenga, L., Komici, K., Corbi, G., Cittadini, A., Ferrara, N., Rengo, G. (2018). The Management of Combined Antithrombotic Therapy in Patients With Atrial Fibrillation Undergoing Percutaneous Coronary Intervention: A Particularly Complex Challenge, Especially in the Elderly. *Frontiers in Physiology*, 9. doi: <http://doi.org/10.3389/fphys.2018.00876>

12. Lang, T. A., Sesik, M.; Leonov, V. P. (Ed.) (2011). *Kak opisyvat statistiku v meditsine*. Moscow: Prakticheskaya meditsina, 480.

13. Lapach, S. N., Chubenko, A. V., Babich, P. N. (2001). *Statisticheskie metody v mediko-biologicheskikh issledovaniakh s ispolzovaniem Excel*. Kyiv: Morion, 408.

14. Lip, G. Y. H., Collet, J.-P., Haude, M., Byrne, R., Chung, E. H. et. al. (2018). 2018 Joint European consensus document on the management of antithrombotic therapy in atrial fibrillation patients presenting with acute coronary syndrome and/or undergoing percutaneous cardiovascular interventions: a joint consensus document of the European Heart Rhythm Association (EHRA), European Society of Cardiology Working Group on Thrombosis, European Association of Percutaneous Cardiovascular Interventions (EAPCI), and European Association of Acute Cardiac Care (ACCA) endorsed by the Heart Rhythm Society (HRS), Asia-Pacific Heart Rhythm Society (APHRS), Latin America Heart Rhythm Society (LAHRS), and Cardiac Arrhythmia Society of Southern Africa (CASSA). *EP Europace*, 21 (2), 192–193. doi: <http://doi.org/10.1093/europace/euy174>

15. Sambola, A., Mutuberría, M., Garcia del Blanco, B., Alonso, A., Barrabés, J. A., Alfonso, F. et. al. (2016). Effects of Triple Therapy in Patients With Non-Valvular Atrial Fibrillation Undergoing Percutaneous Coronary Intervention Regarding Thromboembolic Risk Stratification. *Circulation Journal*, 80 (2), 354–362. doi: <http://doi.org/10.1253/circj.cj-15-0923>

16. Calenda, B. W., Fuster, V., Halperin, J. L., Granger, C. B. (2016). Stroke risk assessment in atrial fibrillation: risk factors and markers of atrial myopathy. *Nature Reviews Cardiology*, 13 (9), 549–559. doi: <http://doi.org/10.1038/nrcardio.2016.106>

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MORPHOLOGICAL STUDY OF AORTA IN PATIENTS WITH ACUTE AORTIC SYNDROMES

p. 37-40

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Purpose of the study is to investigate the morphology of the aortic wall in patients with acute aortic syndrome.

Materials and methods. The results of morphological study of aneurysmatic fragments (n=52), which were collected intra-operatively, each fragment were prepared on the basis of the SI “V. T. Zaycev Institute of General and Urgent Surgery AMSU”, which were coloured with hematoxylin eosin, elastic fibers/ were incubated with antibodies to IgG, and with Apo-Alert DNA Fragmentation to determine apoptosis.

Results. Post-coarctation aneurysms had the following microscopic picture: a decrease in the medial layer with small fields of disorganization of elastic fibers and smooth muscle cells (SMC). The detection of apoptotic cells in the sections is minimal. In the group of acute aortic dissection aneurysms in 40 % of cases, the elastic fibers were fragmented, the SMC are chaotic with separate parts of the isocytane medineocrine - a typical pattern for Marfan's syndrome. A microscopic study of thoracoabdominal aneurysms showed a significant decrease in the middle layer with the development of fibrosis. When counting the total number of cells, a decrease in smooth muscle cells was found on average by 54 %. The aneurysms of the abdominal aorta were characterized by major degenerative changes. Reducing the medial layer and fibrous changes were also the most significant. Reduction of the medial layer and fibrous changes were most significant in this group

Conclusions. All types of complicated aneurysms are characterized by insufficiency of smooth muscle cells in aortic wall. The study found that a decrease in the number of smooth muscle cells can occur due to apoptosis. There is a clear correlation with inflammatory infiltration by cells that produce apoptosis induction

Keywords: aorta, morphological studies, smooth muscle cells, aortic dissection, acute aortic syndrome

References

1. Bokeriya, L. A., Samuilova, D. Sh., Averina, T. B., Samsonova, N. N. et. al. (2004). Sindrom sistemnogo vospalitel'nogo otveta u kardiokhirurgicheskikh bolnykh. [Systemic inflammatory response syndrome in cardiac surgery patient]. *Byulleten NTSSKh im. A. N. Bakuleva RAMN*, 5 (12), 2–24.

2. Zemtsovskiy, E. V., Malev, E. G. (2012). Malyye anomalii serdtsa i displasticheskiye fenotipy [Minor heart anomalies and dysplastic phenotypes]. Saint Petersburg: Izd-vo «IVESEP», 160.

3. Yarilin, A. A.; Moroz, B. B. (Ed.) (2001). Apoptoz: priroda fenomena i ego rol v norme i pri patologii. Aktualnyye problemy patofiziologii [Apoptosis: phenomenon nature and its role in pathology]. Moscow.

4. Rudoy, A. S., Uryvaev, A. M. (2015). Syvorotochnyye urovni TGF u patsiyentov s sindromom Marfana i «serologicheskaya tomografiya aorty» [Serum levels of TGF in patients with Marfan Syndrome and “serological tomography of aorta”]. *Terapiya*–2015, 137.

5. Chinov, E. Yu., Mironenko, V. A., Rychin, S. V. et. al. (2014). Khirurgicheskaya korrektsiya dugi aorty pri ostrom rassloyenii aorty 1 tipa [Surgical correction of aortic arch in acute aortic dissection type 1]. *Byulleten NTSSKh im. A. N. Bakuleva RAMN Serdechno-sosudistyye zabolovaniya*, 15 (S6), 52.

6. Franken, R., den Hartog, A. W., Radonic, T., Micha, D., Maugeri, A., van Dijk, F. S. et. al. (2015). Beneficial Outcome of Losartan Therapy Depends on Type of FBN1 Mutation in

Marfan Syndrome. *Circulation: Cardiovascular Genetics*, 8 (2), 383–388. doi: <http://doi.org/10.1161/circgenetics.114.000950>

7. Vriz, O., Driussi, C., Bettio, M., Ferrara, F., D'Andrea, A., Bossone, E. (2013). Aortic Root Dimensions and Stiffness in Healthy Subjects. *The American Journal of Cardiology*, 112 (8), 1224–1229. doi: <http://doi.org/10.1016/j.amjcard.2013.05.068>

8. Krüger, T., Oikonomou, A., Schibilsky, D., Lescan, M., Bregel, K., Vöhringer, L. et. al. (2016). Aortic leght and the risk of dissection. *The Tubingen Aortic Pathoanatomy (TAIPAN) Project*. *EACTS Daily News*, 2, 14.

9. Lam, C. S. P., Xanthakis, V., Sullivan, L. M., Lieb, W., Aragam, J., Redfield, M. M. et. al. (2010). Aortic Root Remodeling Over the Adult Life Course. *Circulation*, 122 (9), 884–890. doi: <http://doi.org/10.1161/circulationaha.110.937839>

10. Detaint, D., Michelena, H. I., Nkomo, V. T., Vahanian, A., Jondeau, G., Sarano, M. E. (2013). Aortic dilatation patterns and rates in adults with bicuspid aortic valves: a comparative study with Marfan syndrome and degenerative aortopathy. *Heart*, 100 (2), 126–134. doi: <http://doi.org/10.1136/heartjnl-2013-304920>

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FEATURES OF EXISTING FUNCTIONAL DISTURBANCES IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE STAGE II IN THE PROCESS OF INTEGRATED THERAPY WITH THE USE OF TIOTROPIUM BROMIDE

p. 41-46

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The peculiarities of the disturbances of external respiratory function (ERF) in patients with the second stage of COPD, who received tiotropium bromide are presented.

The aim of the study. To evaluate the effect of the baseline therapy of COPD II degree of bronchial obstruction with the use of tiotropium bromide preparation on the parameters of external respiration.

Materials and methods. We examined 151 patients with the second stage of COPD. Verification of the diagnosis and its formulation were performed on the basis of the order of the Ministry of Health of Ukraine № 555 dated June 27, 2013 «On Approval and Implementation of Medical-Technological Documents on Standardization of Medical Assistance in Chronic Obstructive Pulmonary Disease». The examination was performed prior to and on the 30th, 90th and 180th days of standard treatment combined with tiotropium bromide.

Research results. The analysis of aggregate results showed that the highest efficacy was observed in patients who took tiotropium bromide during 180 days, for in this very period external respiratory function parameters maximally increase. Consequently, such a pronounced effect of the used drug tiotropium bromide as a composite basic treatment for stabilizing the function of external respiration in chronic obstructive pulmonary disease II degree, in our opinion, is due to the mechanism of action characteristic of the drug chosen by us, namely, the clear prolonged bronchodilator effect.

Conclusions. Our treatment regimens have a pronounced influence on a number of important pathogenetic links in the course and progression of chronic obstructive pulmonary disease, especially in the initial stages, which clearly confirms the need for early detection of this pathology and early onset of its therapy.

They are characterized by simplicity and accessibility, high clinical efficacy, the absence of adverse reactions and complications
Keywords: chronic obstructive pulmonary diseases, tiotropium bromide, external respiratory function

References

1. Pro zatverdzhennya ta vprovadzheniya medyko-tehnolohichnykh dokumentiv zi standartyzatsiyi medychnoyi dopomohy pry khronichnomu obstruktyvnomu zakhvoryuvanni lehen (2013). Nakaz MOZ Ukrayiny No. 555. 27.06.2013. Available at: <https://zakon.rada.gov.ua/rada/show/v0555282-13>
2. Feshchenko, Yu. I., Yashyna, L. O., Dzyublyk, O. Ya. et. al. (2013). Khronichne obstruktyvne zakhvoryuvannya lehen: etiolojiya, patohenez, klasyfikatsiya, diahnozyka, terapiya (proekt natsionalnoyi uhody). *Ukrayinskyi pulmonolohichnyy zhurnal*, 3, 7–12.
3. The First Comprehensive Survey on respiratory health in EUROPE (2003). *European Lung WHITE BOOK*, 325–397.
4. Tolokh, O. S. (2017). Khronichne obstruktyvne zakhvoryuvannylehen: novi rishennya starykh problem. *Klinichna imunolohiya. Alerholohiya. Infektolohiya*, 1 (98), 16–22. Available at: <https://kiai.com.ua/ua-issue-article-1387/Hronichne-obstruktyvne-zahvoryuvannya-legen-novi-rishennya-starih-problem>
5. Ostrovskyy, M. M. (2016). Khronichne obstruktyvne zakhvoryuvannya lehen: novi vidtinky problemy. *Astma i alerhiya*, 4, 52–54.

6. Decramer, M., Celli, B., Tashkin, D. P., Pauwels, R. A., Burkhart, D., Cassino, C., Kesten, S. (2004). Clinical Trial Design Considerations in Assessing Long-Term Functional Impacts of Tiotropium in COPD: The Uplift Trial. *COPD: Journal of Chronic Obstructive Pulmonary Disease*, 1 (2), 303–312. doi: <http://doi.org/10.1081/copd-200026934>
7. Alagha, K., Palot, A., Sofalvi, T., Pahus, L., Gouitaa, M., Tummino, C. et. al. (2014). Long-acting muscarinic receptor antagonists for the treatment of chronic airway diseases. *Therapeutic Advances in Chronic Disease*, 5 (2), 85–98. doi: <http://doi.org/10.1177/2040622313518227>
8. Anzueto, A., Vogelmeier, C., Kostikas, K., Mezzi, K., Fucile, S., Bader, G. et. al. (2017). The effect of indacaterol/glycopyrronium versus tiotropium or salmeterol/fluticasone on the prevention of clinically important deterioration in COPD. *International Journal of Chronic Obstructive Pulmonary Disease*, 12, 1325–1337. doi: <http://doi.org/10.2147/copd.s133307>
9. Vogelmeier, C. F., Criner, G. J., Martinez, F. J., Anzueto, A., Barnes, P. J., Bourbeau, J. et. al. (2017). Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Lung Disease 2017 Report: GOLD Executive Summary. *Archivos de Bronconeumologia*, 53 (3), 128–149. doi: <http://doi.org/10.1016/j.arbr.2017.02.001>
10. Global Initiative for Chronic Obstructive Lung Disease (GOLD) (2017). Global Strategy for the Diagnosis, Management and Prevention of COPD. Available at: <http://goldcopd.org/>
11. Yu, W. C., Fu, S. N., Tai, E. L., Yeung, Y. C., Kwong, K. C., Chang, Y. et. al. (2013). Spirometry is underused in the diagnosis and monitoring of patients with chronic obstructive pulmonary disease (COPD). *International Journal of Chronic Obstructive Pulmonary Disease*, 8, 389–395. doi: <http://doi.org/10.2147/copd.s48659>
12. Wedzicha, J. A., Decramer, M., Ficker, J. H., Niewoehner, D. E., Sandström, T., Taylor, A. F. et. al. (2013). Analysis of chronic obstructive pulmonary disease exacerbations with the dual bronchodilator QVA149 compared with glycopyrronium and tiotropium (SPARK): a randomised, double-blind, parallel-group study. *The Lancet Respiratory Medicine*, 1 (3), 199–209. doi: [http://doi.org/10.1016/s2213-2600\(13\)70052-3](http://doi.org/10.1016/s2213-2600(13)70052-3)