Conclusions. The obtained results demonstrate the ability of the CMJ-33 and CMT-67 to induce the formation of NO derivatives, in particular, NO_2 in liver tissue. This can be certified as a positive moment because nitrite acts by a mechanism distinct from that of nitric oxide, and it is capable of modulating multiple intracellular/extracellular signaling pathways, at lower concentrations than those required for induction of methemoglobinemia and vasodilation. Evaluation of the NO homeostasis is important for the research of new bioactive compounds for a better understanding of their mechanisms of action, which will facilitate not only the discovery of new targets for their action, but also the development of new therapeutic agents.
Key words: nitric oxide metabolites, copper coordinating compounds, thiosemicarbazide derivatives, liver tissue.

294.   ISCHEMIA-REPERFUSION INJURY IN OVARIES

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Introduction. Ovarian torsion is a condition in which the ovary twists around its pedicle resulting in diminished blood flow with the ischemia of the organ. It is the fifth most common cause of acute abdomen in women and requires detorsion to treat. Following reperfusion a cascade of reactions is initiated with the formation of reactive oxygen and nitrogen species (ROS, RNS), which lead to cell injury.
Aim of the study. To determine the effects of ischemia-reperfusion injury on ovarian viability and later fertility in patients with ovarian torsion.
Materials and methods. Studies from the specialized journals of PubMed, Medline, Hinari were used, which focused on the structural and functional changes in detorsioned ovaries, their viability, follicular reserve and fertility.
Results. Ischemia in torsioned ovaries leads to the formation of ROS and RNS such as superoxide anion radicals, nitric oxide and others. Following reperfusion the influx of large amounts of oxygen leads to the increase of ROS production which causes inflammation and tissue damage. Therefore the damage to the tissue is exponentially more severe in the reperfusion rather than in the ischemic phase. ROS are responsible for the peroxidation of the membrane lipids with the formation of malonic dialdehyde (MDA), increased cell membrane permeability, DNA chain breaks and mutations, massive influx of Ca^{2+} from its binding sites with the release of cytochrome c from the mitochondria and activation of caspase-dependent cell death. These free radicals are scavenged by the antioxidant enzymes, such as superoxide dismutase, catalase and by vitamin C, which seems to be present in high concentrations in the ovary and can help partly minimize the cell damage. Studies in patients with ovarian torsion show that the majority of detorsions are successful even in later stages with the recovery of normal blood flow and the preservation of the organ structure. Follicular reserve has also been shown to be maintained even after prolonged periods of ischemia. Few studies are available for the fertility of these patients, but nonetheless they show pregnancies in the majority of cases.
Conclusions. The ovary seems to possess a certain degree of resistance to ischemia-reperfusion injury even after long periods of ischemia as shown by the preservation of its structure, follicular reserves and fertility, but further studies are required to assess all of the

consequences. Thus, conservative treatment of ovarian torsion is encouraged with gradual detorsion of the organ.

Key words: ovarian torsion, ischemia-reperfusion injury, ROS

295. NATRIURETIC PEPTIDES IN THE PATHOGENESIS AND DIAGNOSIS OF CHRONIC HEART FAILURE

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Introduction. Chronic heart failure (CHF) is a severe health problem today, which is the most common cause of death globally. Half of the patients primarily diagnosed with heart failure, will die within 4 years, whereas those with severe heart failure will die within a year, in more than 50% of cases. This problem underpins the importance of an early diagnosis and risk stratification of the patients suffering from heart failure.

Aim of the study. The aim of the study was to determine the role of the natriuretic peptide (NP) family in the pathogenesis of chronic heart failure, as well as the biomarker potential in early diagnosis of the disease.

Materials and methods. A descriptive review was carried out, based on the scientific articles published during 2016-2020 in journals from PubMed and Google Scholar databases, by using the keywords "natriuretic peptide" and "chronic heart failure".

Results. The NP system is represented by five structurally similar peptides: ANP – atrial natriuretic peptide, BNP – brain natriuretic peptide, CNP – C-type natriuretic peptide, and DNP – dendroaspis natriuretic peptide. NPs interfere with blood pressure regulation by decreasing systemic vascular resistance, increasing the cardiac output, regulating the hydroelectrolyte balance by promoting natriuresis and diuresis due to neuro-hormonal suppression (renin-angiotensin-aldosterone system, norepinephrine, and endothelin-1) and exhibiting anti-proliferative and anti-fibrotic effects. Thus, the NPS are counteracting the main pathophysiological mechanisms found in patients with HF. The plasma NP levels can be used for initial diagnosis, especially in non-severe clinical presentation. Patients with normal NP levels are less likely to develop HF. B-type natriuretic peptide (BNP) and N-terminal propeptide of BNP (NT-proBNP) are the key members of the natriuretic peptide family, which have been recommended as gold standard biomarkers for heart failure diagnosis and prognosis (2016 ESC Guidelines on diagnosis and treatment of acute and chronic heart failure). 35 pg/ml for BNP and 125 pg/ml for NT-proBNP are the upper reference values in non-acute cases. The following factors should be considered when interpreting the BNP values: age (elderly people have higher BNP values), concomitant therapies and renal function. High NP values might be found in other cardiac and non-cardiac disease.

Conclusions. In case of CHF, BNP and NT-proBNP assessment is the most significant marker in diagnosing and stratifying the severity of the disease at its onset, since high levels of NP leads to recurrent hospitalization and sudden cardiac arrest.

Key words: chronic heart failure, natriuretic peptides, biomarkers