

241. Different mechanisms of vascular adaptation to hypertension in male and female mRen2 rats

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Introduction: Hypertension (HTN) is a major cardiovascular risk factor.

Interestingly, the overall cardiovascular risk is lower in women than in men. In view of effectiveness of the renin-angiotensin system (RAS) inhibitors in HTN therapy, RAS appears to play a crucial role in the pathomechanism of HTN.

Aim: Here we studied the potential mechanisms and sex differences of vascular adaptation to high blood pressure evoked by RAS activation.

Materials and Methods: Mean arterial pressure (MAP) of transgenic renin overexpressing rats (mRen2) was decreased (females from 138.5 ± 11.7 to 91.8 ± 5.4 mmHg, males from 168 ± 5.8 to 105.4 ± 13.9 mmHg) from the age of 15 weeks to 1 year. Internal non-transgenic wild type rats (WT) served as controls. To reveal the mechanisms of vascular adaptation to chronic HTN skeletal muscle and mesenteric arteries (female $n=5-7$ /group, male $n=3-4$ /group) were studied, *in vitro*.

Results: The spontaneous myogenic tone of skeletal muscle arteries decreased in female mRen2 rats (ratio of diameters at the presence and the absence of extracellular Ca^{2+} : WT: $72.56 \pm 4.5\%$, mRen2: $89.51 \pm 5.5\%$, $P < 0.05$), while it was unaltered in males. There were differences in the endothelial dysfunction in males and females. The maximal acetylcholine-induced dilation was decreased in male mRen2 rats (male WT: $65.1 \pm 3.7\%$, mRen2: $27.6 \pm 12.8\%$, $P = 0.06$; female WT: $63.8 \pm 4.9\%$, mRen2: $66.9 \pm 4.9\%$, $P = 0.6$). In contrast, the sensitivity for acetylcholine was reduced in female mRen2 rats (female WT EC_{50} : 49 nM, mRen2 EC_{50} : 778 nM, $P < 0.05$; male WT EC_{50} : 630 nM, mRen2 EC_{50} : 637 nM). Smooth muscle function was also affected. Efficacy of endothelin-1 to evoke constriction was higher in WT males than in females (constriction $36 \pm 2.5\%$ and $79.7 \pm 5.4\%$, respectively, $P = 0.002$). This difference was not seen in mRen2 rats (constriction male: $63.9 \pm 11.7\%$ vs. female: $56.4 \pm 10.9\%$).

Conclusions: Our work confirmed sex differences in vascular function and adaptation to chronic HTN in mRen2 rats. Such diversity may explain the lower cardiovascular risk of women compared to men.

242. Severe aortic stenosis and coronary artery disease – should we perform concomitant balloon aortic valvuloplasty and percutaneous coronary intervention?

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Introduction: Aortic stenosis (AS) is the most frequent valvular disease among the elderly, concomitant coronary artery disease (CAD) occurs among 25-50% of patients with AS.

Aim: The aim of this study was to assess early and mid-term results after balloon aortic valvuloplasty (BAV) procedure alone in comparison with combined BAV and percutaneous coronary intervention (PCI) at the same time.

Material and methods: The study group consisted of 47 patients (mean age 83.8 ± 5.6 years) with severe AS. Combined BAV and PCI procedure was performed at the same time in 10 patients (21.3%).

Results: Median follow-up was 674.7 ± 424.9 days. Patients who underwent concomitant PCI and BAV had lower incidence of both previous myocardial infarction (50.0% vs. 64.9%, $p = 0.4$) and atrial fibrillation (40% vs. 48.7%, $p = 0.6$), but they more frequently suffered from diabetes mellitus type 2 (50.0% vs. 46.0%, $p = 0.8$) and arterial hypertension (100% vs. 86.5%, $p = 0.2$). Moreover, NYHA class IV occurred more often before procedure in concomitant PCI and BAV group (80% vs. 35.14%, $p = 0.03$). Patients after BAV alone were younger (82.9 ± 5.8 vs. 87.1 ± 3.2 years, $p = 0.03$), required lower load of contrast and dosage of heparin (44.6 ± 47.4 vs. 123 ± 64.0 ml, $p = 0.008$; 4000 ± 1432 vs. 5833 ± 1061 IU, $p = 0.005$, respectively) in comparison with concomitant BAV and PCI group. Fluoroscopic time (9.0 ± 5.4 vs. 19.1 ± 5.5 [min], $p = 0.005$) and radiation dose (0.48 ± 0.69 vs. 0.62 ± 0.28 Gy, $p = 0.04$) were also significantly lower in BAV alone group. No differences in term of both in-hospital and the longest available follow-up mortality was observed between analyzed groups (10.8% vs. 10.0%, $p = 0.9$; 35.1% vs. 20.0%, $p = 0.4$, respectively). No differences in rate of cardiac tamponade (8.1% vs. 0%, $p = 0.4$), hemorrhage (5.4% vs. 0%, $p = 0.5$) and pseudoaneurysm (2.7% vs. 0%, $p = 0.6$) were reported in comparison of both groups.

Conclusion: No significant differences in terms of mortality between BAV alone group in comparison with concomitant PCI and BAV group were noticed. Post-procedural complications rate was similar in both groups.

243. Rotational atherectomy: in-hospital and one-year results of off-label use in no-operative patients

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Introduction: Rotational atherectomy (RA) is a technique of percutaneous coronary intervention used to treat highly calcified coronary lesions, which cannot be dilated with standard balloon catheter. Real-world patients often present a challenge to cardiologist and force to proceed with off-label use of RA, which include: acute myocardial infarction with presence of thrombus, saphenous vein graft lesions and stenosis in the last remaining vessel.

Aim: The aim of this study was to compare in-hospital and 1-year follow-up outcomes between off-label and on-label use of RA.

Material and methods: We enrolled 207 consecutive patients who underwent RA procedure in an experienced center. Patients who had ≥ 1 off-label indication were assigned to the off-label group ($n=19$) whereas others were assigned to the on-label group ($n=188$). The relevant clinical and angiographic data 1-year follow-up outcomes were retrospectively analyzed.

Results: Patients assigned to the off-label group were older (75 ± 11 vs. 71 ± 9 , $p = 0.02$). The prevalence of comorbidities like heart failure (63% vs. 31%), chronic kidney disease (47% vs. 18%), and peripheral artery disease (53% vs. 29%) was higher in off-label group (all $p < 0.05$). All off-label group patients had recommendation to coronary artery bypass graft (CABG), however they were disqualified from surgery. There was no difference in no/slow flow, side branch occlusion, vessel dissection or perforation, emergency CABG, bradycardia requiring pacemaker implantation in periprocedural and 1-year follow-up in both groups. In-hospital mortality (11% vs. 0%, $p < 0.001$), contrast induced nephropathy (21% vs. 1%, $p < 0.001$) and bleeding (26% vs. 5%, $p < 0.001$) rates were higher in off-label group, with no differences in 1-year follow-up.

Conclusions: Patients undergoing off-label RA have high burden of comorbidities and risk factors. In-hospital mortality and adverse events are more common among those patients, however the total 1-year mortality and adverse events rates are similar when compared to on-label group. This should encourage to perform RA in no-option patients when conservative treatment is associated with poor survival.

244. A controlled hindlimb ischemia model in the rabbit

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Introduction: Today, peripheral arterial disease (PAD) is an important medical and social problem, because this nosology leads to disability and increased mortality in population. This explains the importance of creating anatomical models for studying this pathology.

Aim: Develop anatomically reasonable model of controlled hindlimb ischemia model in the rabbit, which does not cause any acute life-threatening states in laboratory animals and creates conditions for an objective study of the PAD.

Materials and methods: We operated 8 rabbits breed Chinchilla, 4 rabbits, which are not performed surgery was a control group. Body weight of experimental animals averaged 3.0 ± 0.7 kg and age was on a par 17 ± 4 months. During the surgery, we used live tissues electroslugging apparatus «EK 300M» for intravascular ablation.

Results: In all 8 cases, we achieved the desired results. In 4 cases (narrowing of the lumen on 1/2), a chronic hindlimb ischemia model was created, which corresponds to Stage 3 according to Fontaine's classification, in other 4 (narrowing of the lumen on 1/3) cases, was achieved stage 4. No operative intervention caused acute ischemia of the lower limb. Septic complications from the wound in no case was noted.

Conclusions: The proposed controlled hindlimb ischemia model in rabbit is more objective for PAD's study than its analogues in other types of animals (mice). The proposed model allows to cause the desired stage of ischemia according to Fontaine's classification. The proposed model does not cause acute complications in laboratory animals, which significantly reduces their mortality. The proposed model in comparison with its known analogs does not have a significant negative impact on the quality of life of the animal, due to the gradual achievement of the effect.