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REFLECTIONS ABOUT ESTIMATIVE METHOD OF THE ISOLATE PORTAL VEIN CONTRACTILITY

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Summary
The current investigation intended to determine the conditions of portal vein contractions in rats in isometric regime. The proceeding of object preparation as well as experimental phases was described. Main parameters of contractility were highlighted, also the importance of portal vein muscle reactivity at different concentrations of Ca ions. Hypotheses about the origin and mechanism of portal vein muscle contraction were enounced.

Rezumat
Prezenta investigaţie determină condiţiile contracţiilor venei porte la şobolan în regim izometric. A fost descrisă desfăşurat manopera de preparare de obiectului de studiu precum şi etapele experimentale. S-au evidenţiat indicii principali ai contractilităţii, cît şi importanţa reactivitaţii muşchiului venos portal la diferite concentraţii a ionilor de Ca^{2+}. Au fost expuse ipoteze privind originea şi mecanismul contracţiei venei porte izolate.
Keywords - Cajal cells, portal vein, smooth muscle

The present study was done on a group of 200 white male rats, Wistar line with about 180-200 g weight. All the painful manipulations were done under anesthesia, by using Nembutal in dose of 50 mg/kg of the animal's weight or thiopental of Na (0,1g/kg).

In fixed terms and after finishing the experiments the animals were slaughtered through beheading. In anaesthetized rat the thoracic cavity has been opened, was found the vena portae, after which nearby of the liver's entrance was applied the first tweezers which compressed plainly the vena (vein). In this way the vessel is stuffed with blood, becoming larger and comfortable for the manipulations. Then the second tweezers is applied in the lower part of the vessel a little bit higher of confluence of one of its ramification in vena portae. Then with ophthalmic scissors an excision is done below the first tweezers (just near by). The excision continues along the vein's route (longitudinal) making a concrete separation of the conjunctive tissue, without any harm to the vessel wall itself. The vein's excision is done just after tweezers.

All these manipulations had to be done without any additional tension of the vena, in order not to change its contractility, that is to keep the experimental purity.

So, a vena segment of about 4 mm was obtained. Once being extracted from de operating field the given isolated segment together with tweezers was removed into Petri's box which has been filled with Krebs-Henseleit solution, preventively being heated and oxygenated. This proceeding was done as quickly as possible with a maximal exclusion of unfavorable action of the air on the vena. It is necessary to underline this because vena portae in comparison with others represents a vessel which possesses a pace-maker and the harmful influence of the atmospheric air could modify its property. Being put into Petri's box with the given solution the segment of the vena portae was again separated, this time more thoroughly, but keeping its integrity.

After that the separated vena portae has been transported together with Petri`s box to the definite station - the organ's bath thermostatically isolated. The whole "pilgrimage" of the rat's vena portae, extraction and separation inclusively, with an intermittent station in Petri's box must last as less as possible, for about 5-6 min. This term had to be kept strictly in each case in order to respect the experimental purity and for a minimum exposure to the atmospheric air.

So, being in the isolated thermostatic organ's bath an end of the vena portae together with the tweezers is fixed to an immobile hook near the bath's bottom. The second end with the respective tweezers is insert by the mechanotron`s arm 6MX1C, which serves as a translator of force. The position of the vena portae was exactly perpendicular to bath's bottom. The thermostatic bath with a volume of 10 ml was perfused with Krebs-Henseleit solution with the following content (mM/L): NaCl - 22,0; KCl - 4,7; $NaHCO_3$ - 15,5; KH_2PO_4 - 1,2; CaCl - 2,5; $MgCl_2+6H_2O$ - 1,2; glucoza-11,5; 37^oC; the aeration being done with the gas composition O_2 - 95%; CO_2 - 5%; pH-7,3 [1].

The perfusion was prepared just before the experiment from a concentrated solution of the above mentioned salts. $NaHCO_3$ and glucose were added at the end. Until the Ca^{2+} was added preventing the sedimentation of the obtained solution CO_2 was added.

The vascular isolated preparation was extended till the optimal power of contraction with 4 mN. The signal of the mechanotron was transmitted to the amplifier UBP2-03. The recording of the contractile function was done with autorecorder K 200 (RDG). The spontaneous contractions of the isolated vena portae were determined in isometric regime [2, 3], the calibration was done preventively. Before starting the experimental actions the vascular preparation was stabilized for about 45 min till the complete adaptation "in vitro" conditions. Subsequently the recording was doing during 10 min with the film's speed of 1min/cm, then it was changed to 5sec/cm in order to proceed the respective with a 1 min length.

After the end of the recording during 2 min the solution replacement from the isolated bath organs was done and used another solution; Krebs one, which previously was heated and aerated in the trickling column, the concentration of some ions was modified in dependence and exigency of the studies at every stage of it. In some cases the ingredient or the substance which was studied immediately was introduced in the bath of the isolated organs with Krebs solution, as in the group with trypsin "in vitro". The introduced volume was corrected in such a way that the corresponding doze of the substance to be sufficient and the total volume from the bath isolated organs with the respective osmotic pressure to correspond exactly.

Just immediately after vena portae is put in the bath, the recording starts, the regime and exigencies being the same – all 15 min with the specific features which were described previously.

The total time for an experiment from the beginning till the end of the study was about 120 min; in such a way the possible metabolic tiredness being avoid in the vein's segment. The repeated apparatus calibration was inevitable at the end of all experiments. At last, the segment

of the vena portae was weighed in order that the contractility data to be reported to mg/mg of vein's weight.

The following indexes were studied (tab.1):

- the amplitude contraction (mg/mg) through the contraction force report to the contractile portion mass of the vena portae;
- the contraction's frequency (contraction/min);
- the contraction's surface (mm^2/min);
- the intensity of the structures functioning through the amplitude produce to the contractions frequency (mg/mg/min);
- the total contraction time (sec);
- the contraction phase (sec);
- without relaxations (sec);

Table 1. The contractile index value of the isolated vena portae.

Index	Value
Amplitudine, N/mg	35,5±3,28
Frequency, contr/min	6,18±0,4
IFS, Nmg/min	219,4±23,7
Surface, mm^2/min	919,91±86,6
The total contraction time, sec	5,8±0,75
The contraction phase, sec	2,9±0,37
The relaxation phase, sec	2,9±0,37

Discussions and conclusions

1. The mechanotron 6 MXIC, used for measuring the small movements, allows to determine the phasic contractions of the vena portae and less the tonic contractions, because the artifacts (errors) would confuse the correct estimation in this regime. Minimalization of the electric artifacts with the help of the electric transformer connected to the network which stops the tension's fluctuation as well as the presence of the isolated organ bath in the screening room con not be absolute in order for keeping the experimental purity in estimating of the tonic estimation.

2. Changing the solutions in the isolated organ bath may reflect initial recording tonic contractions. It is necessary to keep a strictly liquid volume in isolated organ bath.

3. The amplitude of contractions characterizes the force of contraction and is indissoluble bound by the Ca^{2+} ions reserve from outside, for the smooth vascular venous muscle in different Ca^{2+} ions concentration, is remarkable the change of the venous muscle reactivity of the vena portae in the groups of study in comparison with the control. Modification of the contractions frequency tells us about pacemaker's involvement, the source of the vena portae automatism – interstitial cells of Cajal [4, 5], which have been recently discovered.

4. The intensity of the structures functioning in the studies was changed in some cases on the base of amplitude's transformation in other only on the base of contractions frequency, but there were noticed groups in which the transformation was depended by both index.

5. The other contractile index – the contraction's surface, the total contraction's time, the phase of contraction and of relaxation contribute to supplementation of the contractility characteristic of the smooth vascular muscle of the vena portae.

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EFECTELE NESPECIFICE ALE ESTROGENILOR

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Summary

The non-specific effects of estrogens

The effects of estrogens upon the cardiovascular system are: prevention of atherosclerosis, improvement of the lipid profile and vasodilation. The effects of estrogens upon the digestive system are: reduction of the intestinal peristalsis and increase of absorption. Estrogens also have neurotrophic and neuroprotective effects, along with the prevention of brain ischemia, they have an antidiabetic action, increase the retention of water and sodium, protect the skeletal system and increase blood coagulation. Estrogens also maintain the normal structure of skin in women by promoting keratinocytes and fibroblasts proliferation, and by stimulating its vascularization.

Rezumat

La nivelul sistemului cardiovascular, estrogenii au efect antiaterosclerotic, de ameliorare a profilului lipidic şi de vasodilatare. La nivel digestiv, estrogenii micşorează peristaltismul intestinal, favorizînd absorbţia. Estrogenii mai posedă efect neurotrofic, neuroprotector şi antiischemic cerebral, au acţiune antidiabetică, favorizează retenţia de apă şi sodiu, au efect protector asupra ţesutului osos, majorează coagulabilitatea sîngelui. La nivelul pielii, estrogenii menţin structura ei normală la femei prin promovarea proliferării keratinocitelor, fibroblastelor, prin stimularea vascularizării pielii.

Introducere

Estrogenii sunt hormoni sexuali feminini, de origine steroidă, fiind reprezentaţi de estradiol (cel mai activ), estronă şi estriol (mai puţin activi). Prin penetrarea estrogenilor în celulele-ţintă (din uter, vagin, glanda mamară, sistemul hipotalamo-hipofizar, oase, ficat etc.) şi fiind transportaţi în nucleu, aceştia se cuplează cu receptorii estrogenici (ERα şi ERβ), interacţionînd ulterior cu ADN şi cu proteine celulare specifice, realizînd modularea expresiei şi transcripţiei unor gene şi inducînd sinteza proteinelor în celule.

Pe lîngă efectele specifice asupra organelor sexuale şi asupra dezvoltării sexuale la femei (stimularea proliferării şi dezvoltării uterului, vaginului şi glandelor mamare, proliferarea