Digoxin-Like Immunoreactive Substances (DLIS) in the Serum of Pregnant Women

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Digoxínu podobné imunoreaktívne látky v sére tehotných žien

Summary

A review was performed of the literature concerning the occurrence of digoxin-like immunoreactive substances (DLIS) in the serum of pregnant women in the third trimester of pregnancy, who had never takes digitalis preparations.

The presence of DLIS in the serum can be helpful marker in the diagnosis of EPH-gestosis intensity *(Ref. 39)*.

Key words: pregnancy antenatal care, diagnosis, diagnostic test, DLIS.

Súhrn

Prehľad odbornej literatúry zameraný na výskyt digoxínu podobných imunoreaktívnych látok (DLIS) v sére tehotných žien v treťom trimestri, ktoré nikdy neužívali digitálisové preparáty.

Prítomnosť DLIS v sére môže slúžiť ako pomocný marker pri hodnotení intenzity EPH-gestózy *(lit. 39)*.

Kľúčové slová: tehotnosť, antenatálna starostlivosť, diagnostika, diagnostický test, DLIS.

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One of the more frequent and dangerous periodical complications in the clinical practise of pregnancy abnormalities, is EPH-gestosis – a complex of signs characterized by arterial hypertension (H), oedema (E), and proteinuria (P), occuring exclusively during pregnancy, usually in its last trimester or early puerperium. The condition, if not diagnosed early and not treated, poses a great risk for pregnant woman and foetus and can lead to eclampsia (2, 37). In spite of continuous progress in the diagnosis and treatment, gestosis still opens the list of causes of intrauterina foetal wasting and neonatal death in the perinatal period (6, 26). The aetiology of gestosis is still unknown. It is called "the disease of theory" (2). In practise, a numerical index intensity is used, called the gestosis index, according to which, gestosis is divided into light (1-4 points), moderate (5-8 points) and severe (over 8 points). Apart from the above mentioned signs, i.e. arterial hypertension, proteinuria and oedema, biochemical markers appear in blood of pregnant woman, indicating the risk for gestosis, or its occurence (23, 31).

Due to disturbances in glomerular filtration, serum concentrations of uric acid, urea and creatinice increase (23, 24, 38). The determination of uric acid value in the serum of pregnant women with perinatal EPH gestosis is of great diagnostic importance (38). As the result of reduced uterine blood flow, both the uterus and the placenta and foetus can produce great amounts of lactates which also can exert and effect on hyperuricaemia. Through the increase of permeability of the renal glomeruli, serum albumin and globulin concentrations are decreased. A part of these proteins can be found in excreted urine (2, 38).

In 1981 Schreiber et al. (34) present a report in the Journal of Molecular and Cellular Cardiology on the presence of digoxin-like substances in the blood of rats with circulatory failure due to partial narrowing of the abdominal aorta.

These substances were described as:

Digoxin-Like Immunoreactive Substances (DLIS), or

Endogenous Digitalis-Like Factor (EDLF).

They were detected in rats with experimental arterial hypertension (25), in monkeys with arterial hypertension (16), and

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in the myocardium of pigs (22). Goto et al. (12) suggest that DLIS is characteristic of mammals. Graves et al. (13) have found the presence of DLIS in the serum of patients with manifestations of renal failure, with creatinine concentration over 2 mg%, not receiving digitalis preparations. Serum concentration of DLIS in 90 % of these patients was not exceeding 0.6 mg/ml. These authors (13), similarly as Goto (9), suggest that digoxin-like substances exert an influence on arterial blood pressure regulation. The occurrence of digoxin-like substances was found in humans and animals not receiving digitalis preparations (36). Goto et al. (11) determined DLIS concentration in the urine of adults with normal blood pressure, who were fed low-salt or high-salt diet. In the studied urine samples a significant difference of DLIS concentrations was found in persons on high-salt diet as compared to those fed normal and low-salt diet. The authors suggest, similarly as Palombo (32), that DLIS is connected with the natriuretic factor and is, maybe, sodium-potassium-ATP-ase inhibitor.

Almazov et al. (1) determined the concentration of atrial natriuretic peptide (ANP) and DLIS in patients with essential hypertension grade I and II before and after intravenous loading with water (22 ml/kg body weight) and with salt (5 % NaCl in dose 6 mmol/kg body weight). The results of the studies were compared with the control group. These authors found a relationship between ANP and DLIS concentrations and the sex and grade of arterial hypertension. Higher values of ANP and DLIS were found in women (in control group and in grade I eseential hypertension) than in men. This relationship was not observed in patients with grade II hypertension.

The higher was this growth, the lower was DLIS concentration before the loading test. Almazov et al. (1) suggest that both studied relationships exert a compensatory effect on water-electrolyte disturbances, developing in patients with essential hypertension.

Naomi et al. (30) determined DLIS in the serum using seven standard radioimmunoassays for digoxin determination, produced by various companies: Baxter Travenol Diagnostic Inc., Benton Dickinson Diagnostic Product Corporation, New England Nucbear, Ciba Corning Diagnostic Corporation, Amersham International and Cambridge Medical Diagnostic. Depending on the test used, significantly varying DLIS concentrations were found in the same studied subjects. In author's opinion (30), the concentration value is influenced probably by incubation time and temperature of the environment in the study process.

Some reports (20) point to the possible effect of high-protein diet on DLIS concentration. High protein concentrations in the serum, according to Valdes et al. (39) increase the concentration of digoxin-like substances. For this reason, serum heating is recommended in order to eliminate proteins and thus to avoid false positive results. Since several years attempts are carried out at determination of biochemical composition of digoxin-like substances (5, 21).

This causes, however, many difficulties since no tissues nor body fluids containing DLIS in amounts sufficient for performance of full structural analysis, have been found as yet in humans or animals.

Hamlyn et al. (18, 19) isolated DLIS in the process of plasmapheresis and chromatographic study from 125 l of plasma from patients with Guillain-Barré syndrome and polyneuropathy. The studied group was selected on the basis of earlier reports on DLIS presence in the serum of these patients. The isolated DLIS was described as a compound with low molecular mass (300-900 g/mol), and the retention time in chromatography was similar to that of ouabain (35).

Low degree of cross reaction (0.014 %) with polyclonal digoxin antibodies indicates that DLIS present in blood is not digoxin (21, 22, 23).

Matthews et al. (27, 28), on the basis of a spectrophotometric analysis, found that DLIS has ouabain properties which evidences that it is its close isomer. Polyclonal ouabain antibodies show a strong cross reaction with DLIS. The authors (27, 28) proposed even the name – ouabain-like compound (OLC).

In the second half of the 1980s reports appeared on the occurrence of digoxin-like substances in the serum of women in the third trimester of pregnancy (9, 14, 29), in urine of pregnant women (8), in amniotic fluid (7, 15) and in the serum of newborns (3, 4, 10, 17, 36).

The reports as yet on the presence of digoxin-like substances in pregnant women were not touching the problem of DLIS presence in pregnant women with EPH-gestosis and possible correlations between gestosis intensity and DLIS concentration.

It seems that it is wothwhile to undertake studies on the assessment of the usefulness of determination of digoxin-like substances in the serum of pregnant women with EPH-gestosis.

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SLOVENČINA NA SLOVÍČKO

áno	***nie***
intravaskulový	*intravaskulárny*
intraventrikulový	*intraventrikulárny*
intrakrániové krvácanie	*intrakraniálne krvácanie*
intramuskulový	*intramuskulárny*
intraartériový	*intraarteriálny*
intraduktový	*intraduktálny*
istmocervixová	*istmocervikálna*
inzulínový aparát	*inzulárny aparát*
intraepitelový	*intraepiteliálny*
infraklavikulový	*infraklavikulárny*
interkostové	*interkostálne*
intraovulová	*intraovulárna*
jednovajíčkové dvojčatá	*jednovaječné dvojčatá*
pokoj na posteli	*kľud na lôžku*
karcinoembryový	*karcinoembryonálny*
korpusový karcinóm	*korporálny karcinóm*
luteová	*luteálna*
lobulový karcinóm	*lobulárny karcinóm*
lymfovaskulový	*lymfovaskulárny*
lobulový	*lobulárny*
muskulový	*muskulárny*
monoklonové	*monoklonárne*
molekulová hmotnosť	*molekulárna hmotnosť*
multifaktorové ochorenie	*multifaktoriálne ochorenie*
metrorágia	*metrorhágia*
mezodermový	*mezodermálny*
makulopapulový rush	*makulopapulárny rush*
multilokulový	*multilokulárny*
molekulový	*molekulárny*
mezenchýmový	*mezenchymálny*
navikulový	*navikulárny*
nastane pôrod	*dôjde k pôrodu*
neurónový	*neuronálny*
nukleový	*nukleárny*
Neisseria gonorrhoeae	*Neisseria gonorrhoea*
odporúčať	*doporučovať*
oblička	*ľadvina*
oportúnne nákazy	*oportunistické nákazy*
pacientok	*pacientiek*
placentové	*placentárne*
v ostatnom čase	*v poslednom čase*
peritoneový	*peritoneálny*
placentový	*placentárny*
polymorfonukleový	*polymorfonukleárny*
perivezikulový	*perivezikulárny*
perimenopauzový	*perimenopauzálny*
protozoárne	*protozoálne*
periapendikový	*periapendikulárny*
postmenopauzový syndróm	*postmenopauzálny syndróm*
parauretrový	*parauretrálny*
parametriový	*parametriálny*
papilový	*papilárny*
parazitové	*parazitárne*
puerperiový	*puerperiálny*
periheparový	*perihepatálny*
periapendikový absces	*periapendikulárny absces*
retikuloendotelový systém	*retikuloendoteliálny systém*
rudimentový	*rudimentárny*
resorbovať	*rezorbovať*
reziduový	*reziduálny*
regiónový	*regionálny*