

РЕЗЮМЕТА НА ОТПЕЧАТАНИТЕ В ПЪЛЕН ТЕКСТ НАУЧНИ ТРУДОВЕ НА АЛЕКСАНДЪР БОЖИДАРОВ БЛАЖЕВ, Д.Б.

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ORIGINAL INVESTIGATION

Detection of Free Antielastin Antibodies among Diabetic Children

George Nicoloff, Alexander Blazhev, Chaika Petrova, Petkama Christova, Pavlima Jordanova-Laleva, Dancho Dekov, Plamen Dorovski

ABSTRACT

Antibodies to elastin breakdown products are found in the serum of all human subjects and correlate with their respective serum peptide levels. The presence of these antielastin antibodies (AEAbs) and the corresponding antigens in circulation leads to the formation of circulating immune complexes (CICs). The aim of this study was to determine if the serum levels of free AEAbs (not bound in CICs) correlate with the development of vascular complications in diabetic children. To this end, we used a method for detecting immune complexes (complement inhibition factor [CIF]-enzyme-linked immunosorbent assay [ELISA]) in combination with an ELISA for detection of AEAbs. The levels of free immunoglobulin G (IgG) AEAbs were studied in the sera of 54 diabetic children (mean age 12.3 ± 4 years; diabetes duration 5.2 ± 3.7 years). Thirty-two of the children had vascular complications (group 1), and 22 were without vascular complications (group 2). Twenty healthy children (mean age 13.6 ± 4.2 years) were used as controls. The diabetics showed statistically significant higher levels of free AEAbs ($0.490 E^{402} \pm 0.244 E^{402}$ vs $0.307 E^{402} \pm 0.081 E^{402}$; $p = .02$) compared with the control group. In group 1, free AEAbs showed statistically significant higher levels than controls (0.523 ± 0.269 vs 0.307 ± 0.081 ; $p = .016$). Eighteen of 54 (33%) patients were positive for free AEAbs (13 of 32 [41%] in group 1 and 5 of 22 [22%] in group 2). Free AEAbs levels in all diabetics showed a correlation with systolic blood pressure ($r = .44$; $p = .01$), diastolic blood pressure ($r = .46$; $p = .009$), total cholesterol ($r = .33$; $p = .05$), triglycerides ($r = .38$; $p = .03$), high-density lipoprotein ($r = -.46$; $p = .009$), serum fructose ($r = .43$; $p = .001$), and microalbuminuria ($r = .41$; $p = .002$). Patients who had vascular pathology showed a correlation of free AEAbs with microalbuminuria ($r = .434$; $p = .026$), serum fructose ($r = .63$; $p = .0004$), hemoglobin A_{1c} ($r = .392$; $p = .043$), and triglycerides ($r = .456$; $p = .025$). These findings sug-

gest that elevated levels of free IgG AEAbs are associated with the development of diabetic vascular complications in children.

Key Words: diabetes mellitus, complement inhibition factor (CIF)-enzyme-linked immunosorbent assay, free antielastin antibodies, microalbuminuria

Patients with the juvenile onset of type 1 (insulin dependent) diabetes mellitus are at high risk of diabetic microvascular complications owing to alteration in the structure of the vascular proteins.

The major vascular proteins responsible for compliance and elasticity are the elastic fibers, which are organized into distinct layers called elastic lamellae. These sheet-like structures separate layers of smooth muscle cells and are designed to distribute tension uniformly throughout the vessel's wall. In many vascular diseases, elastic fiber degradation or calcification results in altered vascular mechanics and distinctive pathology.



Our previous studies have documented an increased degradation of elastin, the main protein of elastic fibers, in diabetic children with microangiopathy.^{1,2} As a consequence, soluble elastin-derived peptides (EDPs) present in the circulation are a pathologic stimulus for the production of antielastin antibodies (AEAbs).²

A variety of autoantibodies have been documented in type 1 diabetes, including insulin autoantibodies, glutamic acid decarboxylase (GAD) autoantibodies, tyrosine phosphatase IA2 autoantibodies, islet cell autoantibodies,³ AEAbs,² and collagen type IV autoantibodies.⁴ These autoantibodies bind to their cognate antigens and thus form circulating immune complexes (CICs). Such CICs may have pathogenic potential because they can give rise to microangiopathy following deposition in small blood vessels.

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Article

Elevated IgG and IgM Autoantibodies to Advanced Glycation End Products of Vascular Elastin in Hypertensive Patients with Type 2 Diabetes: Relevance to Disease Initiation and Progression

Krasimir Kostov ^{1,*}  and Alexander Blazhev ² 

¹ Department of Pathophysiology, Medical University-Pleven, 1 Kliment Ohridski Str., 5800 Pleven, Bulgaria

² Department of Biology, Medical University-Pleven, 1 Kliment Ohridski Str., 5800 Pleven, Bulgaria; yalishanda9@gmail.com

* Correspondence: dr.krasi_kostov@abv.bg; Tel.: +359-889-257-459

Abstract: The increased glycation of elastin is an important factor in vascular changes in diabetes. Using the ELISA method, we determined serum levels of IgM and IgG autoantibodies to advanced glycation end products of vascular elastin (anti-AGE EL IgM and anti-AGE EL IgG) in 59 hypertensive patients with type 2 diabetes (T2D) and 20 healthy controls. Serum levels of matrix metalloproteinases-2 and -9 (MMP-2 and MMP-9) and the C-reactive protein (CRP) were also determined. The levels of anti-AGE EL IgM antibodies in the T2D group were similar to those in the control group, while those of anti-AGE EL IgG antibodies were significantly higher ($p = 0.017$). Significant positive correlations were found between the levels of anti-AGE EL IgM antibodies and MMP-2 ($r = 0.322$; $p = 0.013$) and between the levels of anti-AGE EL IgG antibodies and CRP ($r = 0.265$; $p = 0.042$). Our study showed that elevated anti-AGE EL IgG antibody levels may be an indicator of the enhanced AGE-modification and inflammatory-mediated destruction of vascular elastin in hypertensive patients with T2D. Anti-AGE EL IgM antibodies may reflect changes in vascular MMP-2 activity, and their elevated levels may be a sign of early vascular damage.

Keywords: hypertension; type 2 diabetes; advanced glycation end products (AGEs); autoantibodies to AGEs of vascular elastin



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Kostov K, **Blazhev A**. Serum Anti-Collagen IV IgM and IgG Antibodies as Indicators of Low Vascular Turnover of Collagen IV in Patients with Long-Term Complications of Type 2 Diabetes. *Diagnostics*. 2021; 11(5): 900. ISSN: 2075-4418, [Web of Science Q2 IF\(2021\) 3.992](#), [Scopus Q2 SJR\(2021\) 0.658](#) (20 T.)



Article

Serum Anti-Collagen IV IgM and IgG Antibodies as Indicators of Low Vascular Turnover of Collagen IV in Patients with Long-Term Complications of Type 2 Diabetes

Krasimir Kostov ^{1,*} and Alexander Blazhev ²

¹ Department of Pathophysiology, Medical University-Pleven, 1 Kliment Ohridski Str., 5800 Pleven, Bulgaria

² Department of Biology, Medical University-Pleven, 1 Kliment Ohridski Str., 5800 Pleven, Bulgaria; yalishanda9@gmail.com

* Correspondence: dr.krasi_kostov@abv.bg; Tel.: +359-889-257-459

Abstract: Thickening of the vascular basement membrane (BM) is a fundamental structural change in the small blood vessels in diabetes. Collagen type IV (CIV) is a major component of the BMs, and monitoring the turnover of this protein in type 2 diabetes (T2D) can provide important information about the mechanisms of vascular damage. The aim of the study was through the use of non-invasive biomarkers of CIV (autoantibodies, derivative peptides, and immune complexes) to investigate vascular turnover of CIV in patients with long-term complications of T2D. We measured serum levels of these biomarkers in 59 T2D patients with micro- and/or macrovascular complications and 20 healthy controls using an ELISA. Matrix metalloproteinases-2 and -9 (MMP-2 and MMP-9) were also tested. In the T2D group, significantly lower levels of CIV markers and significantly higher levels of MMP-2 and MMP-9 were found compared to controls. A significant positive correlation was found between IgM antibody levels against CIV and MMP-2. These findings suggest that vascular metabolism of CIV is decreased in T2D with long-term complications and show that a positive linear relationship exists between MMP-2 levels and CIV turnover in the vascular wall.

Keywords: type 2 diabetes; collagen IV; vascular basement membrane; matrix metalloproteinases-2 and -9; diabetic vascular complications



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Article

Estimation of *Ixodes ricinus* (Acari: Ixodidae) Populations of Kaylaka Park in the Town of Pleven, Bulgaria

Alexander Blazhev ^{1,*}, Milena Atanasova ¹, Krasimir Kostov ², Tsetsa Doychinova ³, Svetla Blazheva ⁴ and Milena Karcheva ³

¹ Department of Biology, Medical University-Pleven, 1 Kliment Ohridski Str., 5800 Pleven, Bulgaria; milena.atanasova-radeva@mu-pleven.bg

² Department of Pathophysiology, Medical University-Pleven, 1 Kliment Ohridski Str., 5800 Pleven, Bulgaria; dr.krasi_kostov@abv.bg

³ Department of Infectious Diseases and Epidemiology, Medical University-Pleven, 1 Kliment Ohridski Str., 5800 Pleven, Bulgaria; doichinova_cca@abv.bg (T.D.); milena_karcheva@abv.bg (M.K.)

⁴ Department of Immunology, University Hospital, 5800 Pleven, Bulgaria; svetlabl@abv.bg

* Correspondence: yalishanda9@gmail.com; Tel.: +35-(99)-88986865



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Simple Summary: Hard ticks transmit the etiological agents of numerous diseases. Kaylaka Park is a protected area, but part of it is designated for various outdoor activities. The aim of our study was to establish the presence of hard ticks in four urbanized areas and four areas that are not maintained and are natural wilderness areas (wild areas). The flagging method of collection was used. Temperature, relative humidity, both collection time and distance covered were measured during the sampling campaigns. The density of ticks collected was calculated, the number of ticks captured per minute was calculated and the results were compared between urban and wild areas over a five-year period (2016–2020). A total of 622 ticks were collected. All of them were identified as *Ixodes ricinus*. Significant differences between the urban and wild areas were observed in the number of ticks per minute and density of nymphs. The peak in questing tick activity has been established at the end of April. The highest yield was obtained at 20 °C and at 60% relative humidity. We found that the distribution of *Ixodes ricinus* ticks is widespread in Kaylaka Park. Their high density poses a serious risk to park visitors in both wild and maintained urban areas.

Abstract: (1) Background: Ticks are vectors of a large number of pathogenic microorganisms, which cause serious diseases in both humans and animals. Kaylaka Park is located in northern Bulgaria close to the city of Pleven. Part of the park is urbanized and visited daily by many citizens. The aim of our study was to determine the presence and distribution of hard ticks in the park area by surveying and comparing four urbanized with four wild areas. (2) Methods: Ticks were collected by flagging from 2016 to 2020 during the spring–summer season (March–July). Air temperature, relative humidity, collection time and flagging area were measured during the campaign. (3) Results: A total of 622 ticks were collected: 285 females (46%), 272 (44%) males and 64 (10%) nymphs. All were identified as *Ixodes ricinus*. Wild areas showed statistically significant higher values of ticks collected per minute ($p = 0.009$) and nymph densities ($p = 0.003$) compared to urbanized sampling sites. Other densities indices did not have a significant difference between urban and wild areas. Highest numbers of *Ixodes* ticks were collected at a temperature of 20 °C and at 60% relative humidity. The active questing began in March, peaked in end of April and declined in June. (4) Conclusions: In the present study, we found that ecological factors in the Kaylaka Park area are favourable for the development and distribution of tick populations. The results give us reason to consider that there is a high risk to visitors from tick bites in the Kaylaka Park area.

Keywords: *Ixodes ricinus*; tick collection; tick density; flagging; medical entomology; Kaylaka Park

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Article

Anaplasma and Ehrlichia Species in Ixodidae Ticks Collected from Two Regions of Bulgaria

Iskren Stanilov ¹, Alexander Blazhev ² and Lyuba Miteva ^{1,*}

¹ Department of Molecular Biology, Immunology and Medical Genetics, Faculty of Medicine, Trakia University, 6000 Stara Zagora, Bulgaria

² Department of Biology, Medical University-Pleven, 5800 Pleven, Bulgaria

* Correspondence: lyuba.miteva@trakia-uni.bg; Tel.: +359-42-664274

Abstract: The aim of the study was to determine prevalence of *Anaplasmataceae*-infected ticks in the Black Sea Coast and the Pleven regions of Bulgaria. A total of 350 ticks from different tick species were collected. Two hundred fifty-five ticks were removed from dogs in the Black Sea Coast region, and 95 *Ixodes ricinus* ticks were collected by flagging vegetation with a white flannel cloth in two areas in the region of Pleven. After the DNA isolation of the ticks, a genus-specific polymerase chain reaction (PCR) was performed to identify *Anaplasmataceae*. Second PCRs were performed with species-specific primers to identify *Ehrlichia canis* (*E. canis*) and *Anaplasma phagocytophilum* (*A. phagocytophilum*). The results showed that 26.9% of the *Ixodes ricinus* ticks were infected with *Anaplasmataceae* in the Black Sea Coast region and 36.8% in the Pleven region. The infection with *E. canis* was detected in 35.7% and *A. phagocytophilum* in 25.0% of positive ticks from the Black Sea Coast region. In the Pleven region, 22.9% of ticks were positive for *E. canis*, while 42.9% were positive for *A. phagocytophilum*. The molecular identification of *E. canis* in ticks collected from Bulgaria was performed for the first time. In conclusion, the present study revealed a higher prevalence of ticks infected with *Anaplasmataceae*, particularly *A. phagocytophilum*, in the Pleven region than in the Black Sea Coast region.

Keywords: *E. canis*; *A. phagocytophilum*; *Anaplasmataceae*; species-specific PCR



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¹ Department of Biology & Pathological Physiology, University School of Medicine, Pleven, Bulgaria

² Department of Pediatrics, University School of Medicine, Pleven, Bulgaria

³ Central Clinical Laboratory, University School of Medicine, Pleven, Bulgaria

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SERUM LEVELS OF INTERLEUKIN 12 AND INTERLEUKIN 18 IN DIABETIC CHILDREN

A. Blazhev¹, G. Nicoloff¹, Ch. Petrova², P. Jordanova-Laleva³

Key words: diabetes mellitus, ELISA, interleukin-12, interleukin-18

SUMMARY

Forty-six children with type 1 diabetes mellitus (mean age 13.19±3.5 years) and 10 healthy age- and sex-matched volunteers (13.6±4.2 years) were included in the study to compare serum levels of interleukin (IL)-18 and IL-12. IL-18 and IL-12 in serum were measured using an enzyme-linked immunosorbent assay (ELISA). Diabetic subjects were divided into two groups according to the presence (group 1) or absence (group 2) of vascular complications. Significant differences were observed in serum levels of IL-18 and IL-12 between diabetic patients and control subjects (IL-18: 705.6±515.3 pg/mL vs. 128.1±80.7 pg/mL; $p=0.0009$; and IL-12: 245.6±100 pg/mL vs. 58.5±17.3 pg/mL; $p=0.0001$). Group 1 showed a non-significantly higher level of IL-12 than group 2 ($p=0.078$). There was no significant difference in serum IL-18 between group 1 and group 2 ($p=0.28$). In patients with vascular complications, there was a correlation between serum IL-12 and age ($r=0.48$; $p=0.046$). In conclusion, elevated levels of IL-18 and IL-12 suggest that both interleukins may have some etiopathogenic role in diabetes mellitus in children.

Corresponding author: Assoc. Prof. G. Nicoloff, M.D., Ph.D., Department of Biology & Pathological Physiology, University School of Medicine 1, St. Kliment Ohridski Street, 5800 Pleven, Bulgaria
E-mail: nicoloff_bg@yahoo.com

INTRODUCTION

Type 1 (insulin dependent) diabetes mellitus (T1DM) is an autoimmune disease with both genetic and environmental components. Interleukin-12 p40 production influences T cell response, and may therefore be important in T1DM pathogenesis (1). Interleukin-12 (IL-12) drives the differentiation of T lymphocytes towards the Th1 subset, characterized by production of cytokines leading to cell mediated immunity (2-4).

In addition, IL-12 is important in immune response to infections; however, it has been shown that in the absence of infection, IL-12 induced autoreactive T cell responses might predispose to self-destructive immunity (5,6). IL-12 is a disulfide linked heterodimer composed of a heavy chain of 40 kDa (p40) and a light chain of 35 kDa (p35). The two subunits of IL-12 are in contrast to most cytokines, which possess only one polypeptide chain. Many cell types express the p35 chain, while the p40 subunit is expressed mainly by activated macrophages and B cells (7). The heterodimers, p70 or p75, are biologically active parts of IL-12 (8).

IL-18, also known as interferon-gamma (IFN- γ) inducing factor, is a cytokine produced by antigen presenting cells. IL-18 exerts several effects on Th1 cells. IL-18 stimulates Th1 cell proliferation, and also

Nikolov A, Tsinlikov I, Nicoloff G, **Blazhev A**, Tsinlikova I, Stanilova S, Garev A. (2013). Increased elastin turnover in diabetic patients with arterial hypertension. *Central European Journal of Immunology*, 38(4), 537–542. <https://doi.org/10.5114/ceji.2013.39772>
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Increased elastin turnover in diabetic patients with arterial hypertension

ASPARUH NIKOLOV¹, IVAN TSINLIKOV¹, GEORGE NICOLOFF², ALEXANDER BLAZHEV²,
IVANKA TSINLIKOVA¹, SPASKA STANILOVA³, ANTOAN GAREV¹

¹Department of Propedeutics of Internal Diseases, Medical University, Plevna, Bulgaria

²Division of Biology and Immunology, Medical University, Plevna, Bulgaria

³Department of Biology, Trakia University, Stara Zagora, Bulgaria

Abstract

Introduction and aims: Antibodies against products of elastin degradation are found in sera of all people. Presence of anti-elastin antibodies (AEAbs) and relevant antigens in circulation leads to the formation of circulating immune complexes (CIC). The aim of our study is to determine serum levels of anti-elastin antibodies unbound in CIC (free AEAbs).

Material and methods: We used a method for detection C1F-ELISA (complement-inhibiting factor-enzyme linked immunosorbent assay) in combination with ELISA to find AEAbs. The levels of free AEAbs IgG were measured in sera of 93 patients with diabetes mellitus and hypertension (mean age 61.4 ± 11.3, diabetes duration 9.88 ± 3.12; hypertension duration 9.28 ± 4.98). These levels were compared to 42 age- and sex-matched controls.

Results: Free AEAbs IgG in patients with T2DM and AH are statistically significantly higher than these in healthy controls: 0.421 (0.328-0.572) vs. 0.240 (0.212-0.305), respectively (KW = 19.64; $p < 0.0001$). Group 1 (patients with microvascular complications) showed a significant increase in free AEAbs IgG in comparison with controls: 0.428 (0.343-0.591) vs. 0.240 (0.212-0.305), respectively (KW = 20.14; $p < 0.0001$). Group 2 also shows higher levels of free AEAbs IgG than the control group: 0.398 (0.312-0.467) vs. 0.240 (0.212-0.305), respectively (KW = 8.88; $p = 0.003$). Patients with microvascular complications showed the highest levels of free AEAbs IgG. There were no significant differences between group 1 and group 2.

Conclusions: Our results show the association between the activity of elastin turnover and microvascular lesions in diabetic patients with arterial hypertension. We suggest that free AEAbs IgG mark a later "secondary" step of the autoimmunization to elastin.

Key words: ELISA, diabetes mellitus, elastin, arterial hypertension, microangiopathy.

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Atanasova M, Petkova Z, Pechlivanova D, Dragomirova P, **Blazhev A**, Tchekalarova J. (2013). Strain-dependent effects of long-term treatment with melatonin on kainic acid-induced status epilepticus, oxidative stress and the expression of heat shock proteins. *Pharmacology Biochemistry and Behavior*, 111, 44–50. <https://doi.org/10.1016/j.pbb.2013.08.006> ISSN: 0091-3057 Scopus Q1 SJR₂₀₁₃ 1.281, Web of Science Q2 IF₂₀₁₃ 2.820 (25 T.)

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Strain-dependent effects of long-term treatment with melatonin on kainic acid-induced status epilepticus, oxidative stress and the expression of heat shock proteins



Milena Atanasova^a, Zlatina Petkova^b, Daniela Pechlivanova^b, Petya Dragomirova^a, Alexander Blazhev^a, Jana Tchekalarova^{b,*}

^a Department of Biology, Medical University of Pleven, 1 Kliment Ohridski Str., Pleven 5800, Bulgaria

^b Institute of Neurobiology, Bulgarian Academy of Sciences, Acad. G. Bonchev Str., Bl. 23, Sofia 1113, Bulgaria

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ABSTRACT

Oxidative stress is implicated in the pathogenesis of both hypertension and epileptogenesis, therefore it could be used as a tool for studying co-morbidity of hypertension and epilepsy. Clinical data suggest that melatonin is a potent antioxidant that is effective in the adjunctive therapy of hypertension and neurodegenerative diseases. The present study aimed to explore and compare the efficacy of chronic pretreatment with melatonin infused via subcutaneous osmotic mini-pumps for 14 days (10 mg/kg per day) on kainic acid (KA)-induced status epilepticus, oxidative stress and expression of heat shock protein (HSP) 72 in spontaneously hypertensive rats (SHRs) and normotensive Wistar rats. SHRs showed higher lipid peroxidation (LP) in the frontal cortex and hippocampus and decreased cytosolic superoxide dismutase (SOD/CuZn) production in the frontal cortex compared to Wistar rats. Status epilepticus (SE) induced by KA (12 mg/kg, i.p.) was accompanied by increased LP and expression of HSP 72 in the hippocampus of the two strains and increased SOD/CuZn production in the frontal cortex of SHRs. Melatonin failed to suppress seizure incidence and intensity though the latency for seizure onset was significantly increased in SHRs. Melatonin attenuated the KA-induced increase in the level of LP in the hippocampus both in SHRs and Wistar rats. However, an increased activity in SOD/CuZn and mitochondrial SOD Mn as well as reduced expression of HSP 72 in the hippocampus was observed only in Wistar rats pretreated with melatonin. Taken together, the observed strain differences in the efficacy of chronic melatonin exposure before SE suggest a lack of a direct link between the seizure activity and the markers of oxidative stress and neurotoxicity.

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Abnormal levels of age-elastin derived peptides in sera of diabetic patients with arterial hypertension

ASPARUH NIKOLOV¹, IVAN TSINLIKOV¹, GEORGE NICOLOFF², IVANKA TSINLIKOVA¹, ALEXANDER BLAZHEV², ANTOAN GAREV¹

¹Department of Propedeutics of Internal Diseases, Medical University, Plevna, Bulgaria

²Division of Biology and Immunology, Medical University, Plevna, Bulgaria

Abstract

Introduction: An important factor in vascular wall alterations is degradation of elastic fiber major protein – elastin. As a result, elastin derived peptides (EDP) are found in circulation. Advanced glycation might also involve elastin, because it is a protein with slow metabolism. The aim of our study was to measure serum levels of glycosylated elastin derived peptides (AGE-EDP) of elastin in patients with type 2 diabetes mellitus (T2DM) and arterial hypertension (AH).

Material and methods: We adapted an ELISA technique for the determination of AGE-EDP. Sera of 93 patients with T2DM and AH (mean age 61.4 ± 11.3 years, diabetes duration 9.88 ± 3.12 years; hypertension duration 9.28 ± 4.98) were tested. These values were compared to 42 age- and sex-matched controls. Diabetics were divided in two groups according to presence – Group 1 (n = 67) or absence – Group 2 (n = 26) of microangiopathy.

Results: Patients with T2DM and AH showed statistically significantly higher levels of AGE-EDP in comparison with healthy controls 0.060 (0.053+0.065) vs. 0.039 (0.031+0.044) (KW = 35.2; p < 0.0001). Group 1 showed significantly higher levels of AGE-EDP than the control group 0.069 (0.051+0.070) vs. 0.039 (0.031+0.044) (KW = 33.0; p < 0.0001). Group 2 also showed significantly higher levels of AGE-EDP than controls 0.058 (0.049+0.064) vs. 0.039 (0.031+0.044) (KW = 22.1; p < 0.0001). AGE-EDP showed a correlation with an insulin dose (r = -0.28; p = 0.05), systolic blood pressure (r = 0.25; p = 0.01), BMI (r = 0.39; p = 0.01) and retinopathy (r = 0.18; p = 0.05).

Conclusions: The measurement of non-invasive markers of elastin glycation may be useful in monitoring development of vascular wall alterations and therapeutic interventions.

Key words: ELISA, elastin, AGEs, diabetic microvascular complications, arterial hypertension.

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Serum anti-collagen type IV IgM antibodies and development of diabetic nephropathy in diabetics with essential hypertension

ASPARUH NIKOLOV¹, IVAN TSINLIKOV¹, IVANKA TSINLIKOVA¹, GEORGE NICOLOFF², ALEXANDER BLAZHEV², ANTOAN GAREV¹

¹Department of Propedeutics of Internal Diseases, Medical University, Pleven, Bulgaria

²Division of Biology, Medical University, Pleven, Bulgaria

Abstract

Introduction and aims: Arterial hypertension and diabetic vascular complications are connected with an elevated degradation of elastic tissue. This process leads to an increased production of antibodies to collagen type IV (ACIV Abs). In the present investigation we studied whether the serum levels of antibodies (IgG, IgM and IgA) to collagen are related with microvascular complications.

Material and methods: Serum levels of antibodies to collagen type IV (ACIV) IgG, IgM and IgA were measured using an ELISA method in 93 patients with type 2 diabetes mellitus and arterial hypertension (AH) (mean age 61.4 ± 11.3 years, diabetes duration 9.88 ± 3.12 years; hypertension duration 9.28 ± 4.98). These values were compared to serum antibodies to CIV in 42 age and sex matched controls.

Results: ACIV IgM antibodies levels in patients with AH and T2DM were statistically significantly higher than controls 0.178 (0.145+0.220) vs. 0.142 (0.118+0.173) (KW = 6.31; p = 0.01). Group 1 (patients with microvascular complications) showed significantly higher levels of ACIV IgM than controls 0.180 (0.136+0.223) vs. 0.142 (0.118+0.173) (KW = 5.03; p = 0.02). Patients from Group 2 showed statistically significantly higher levels of ACIV IgM than controls 0.176 (0.151+0.202) vs. 0.142 (0.118+0.173) (KW = 6.15; p = 0.01). ACIV IgM antibodies showed correlation with microalbuminuria (r = 0.21); (p = 0.04), BMI (r = 0.19); (p = 0.04), creatinine clearance (r = -0.36); (p = 0.01) and GFR (r = -0.34); (p = 0.02).

Conclusions: Our study showed an association between elevation of serum levels of ACIV IgM and development of diabetic nephropathy. We suggest that levels of ACIV IgM can be useful method for identifying a high risk for development of diabetic nephropathy.

Key words: type 2 diabetes, essential hypertension, anti-collagen type IV IgM antibodies.

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Grigoryan A, Dimitrova A, Kostov G, Ruseva A, Atanasova A, **Blazhev A** Betova T. (2017). Serum concentrations of matrix metalloproteinase-9, -13 and TIMP-1 in an ovariectomized wistar rat model of osteoporosis. *Archives of the Balkan Medical Union*, 52(4), 391–396. ISSN: 1584-9244 **Scopus Q3 SJR₂₀₁₇ 0.192 (15 T.)**

ORIGINAL STUDY

SERUM CONCENTRATIONS OF MATRIX METALLOPROTEINASE-9, -13 AND TIMP-1 IN AN OVARIECTOMIZED WISTAR RAT MODEL OF OSTEOPOROSIS

Armine V. Grigoryan¹, Anella A. Dimitrova¹, Kracimir G. Kostov¹, Adelaida L. Ruseva², Milena A. Atanasova³, Alexander B. Blazhev³, Tatyana M. Betova⁴

¹ Department of Physiology and Pathophysiology, Medical University – Pleven, Bulgaria

² Department of Clinical Laboratory, Medical University – Pleven, Bulgaria

³ Department of Biology, Medical University – Pleven, Bulgaria

⁴ Department of Pathoanatomy, Medical University – Pleven, Bulgaria

ABSTRACT

Introduction. Osteoporosis is a disease characterized by decreased bone density and destruction of the microarchitectonics of the bone structure. This leads to increased bone fragility and risk of fracture particularly of the hip, spine, wrist and shoulder. Osteoporosis is known as „The Silent Epidemic of the Century” because bone loss occurs without symptoms. Altered ovarian function is one of the most common causes of osteoporosis. Indicators for altered bone homeostasis are the changes in serum levels of matrix metalloproteinases (MMPs) and their tissue inhibitors (TIMPs).

Objective. The aim of current study was to determine the activity of alkaline phosphatase (ALP) and serum concentrations of MMP-9, MMP-13 and TIMP-1 in the ovariectomized rats.

Materials and Methods. An experiment was performed on 35 female Wistar rats at reproductive age – 2 months divided into 2 groups: group 1 (G1)-20 animals were sham-operated (sham) and group 2 (G2)-15 were ovariectomized (ovx).

RÉSUMÉ

Concentrations du sérum des métalloprotéinases matricielles-9, -13 et TIMP-1 dans un modèle d'ostéoporose à déficit ostrogénique d'un rat Wistar femelle

Introduction. L'ostéoporose est une maladie caractérisée par une diminution de la densité de la masse osseuse et la destruction de la micro-architecture de la structure osseuse. Cela conduit à une fragilité osseuse accrue et à un risque de fracture, en particulier de la hanche, de la colonne vertébrale, du poignet et de l'épaule. L'ostéoporose est connue comme «l'épidémie silencieuse du siècle» parce que la perte osseuse se produit sans symptômes. L'altération de la fonction ovarienne est l'une des causes les plus fréquentes de l'ostéoporose. Les indicateurs de l'altération de l'homéostasie osseuse sont les changements dans les taux sériques des métalloprotéinases matricielles (MMPs) et de leurs inhibiteurs tissulaires (TIMPs).

Objectifs. Le but de cette étude était de déterminer l'activité de la phosphatase alcaline (ALP) et

Corresponding author:

Armine Grigoryan
Department of „Physiology and Pathophysiology”, Medical University-Pleven
„Kilment Ohridski” Str., № 1, 5800 Pleven, Bulgaria
e-mail: armine14@abv.bg; phone: 0606-31-99-33

Nikolov G, Valkov A, Mirchev S, Karcheva M, Rashev T, **Blazhev A.** (2017). A comparative study on detection antibody to HPV16 and DNA analysis by real-time PCR in carcinomas of the oropharynx and larynx. *General Medicine*, 19(1), 16–19. ISSN: 1311-1817 **Scopus Q4 SJR₂₀₁₇ 0.101 (12 т.)**

СРАВНИТЕЛНО ПРОУЧВАНЕ НА АНТИТЯЛО ДЕТЕКЦИЯ КЪМ HPV16 И ДНК АНАЛИЗ ЧРЕЗ REAL-TIME PCR ПРИ КАРЦИНОМИ НА ОРОФАРИНКС И ЛАРИНКС

Г. Николов¹, А. Вълков¹, С. Мирчев¹, М. Карчева², Т. Рашев³ и А. Блажев^{4*}

¹Клиника по ушни, носни и гърлени болести, Университетска многопрофилна болница за активно лечение – Плевен

²Сектор „Епидемиология, паразитология и тропическа медицина“

³Университетската лаборатория за научни изследвания

⁴Сектор „Биология“, Медицински университет – Плевен

A COMPARATIVE STUDY ON DETECTION ANTIBODY TO HPV16 AND DNA ANALYSIS BY REAL-TIME PCR IN CARCINOMAS OF THE OROPHARYNX AND LARYNX

G. Nikolov¹, A. Valkov¹, S. Mirchev¹, M. Karcheva², T. Rashev³ and A. Blazhev^{4*}

¹Clinic of Otorhinolaryngology, University Multiprofile Hospital for Active Treatment – Pleven

²Department of Epidemiology, Parasitology and Tropical Medicine

³University Scientific Research Laboratory

⁴Department of Biology, Medical University – Pleven

Резюме. Целта на настоящото изследване е да се установи честотата на разпространение на IgG антитела към HPV16 и да се извърши ДНК анализ детекция и количествено определяне чрез Real-time PCR на HPV16 при пациенти със злокачествени новообразувания в орофаринкс и ларинкс и да се установи корелация между имунния отговор и PCR диагностиката на вируса. **Материал и методи.** Извършено е проспективно сероепидемиологично проучване на лица, хоспитализирани и оперирани в Клиника по ушни, носни и гърлени болести, УМБАЛ „Д-р Г. Странски“ – Плевен. Диагнозите са потвърдени хистологично. Чрез използване на Human papillomavirus type 16 (HPV16) antibody, IgG ELISA Kit (CUSABIO Biotech Co, Ltd) е определен преваленс на HPV16 IgG антитела. Приложени са ДНК анализ детекция и количествено определяне чрез real-time PCR на HPV16 Kit GeneSig Standard (Primer Design, Thermo Scientific). **Резултати.** За периода януари-март 2016 г. са изследвани 14 лица със злокачествени новообразувания на орофаринкс и ларинкс, от които 11 мъже и 3 жени. Пациентите са на възраст от 23 до 77 год., средно – 61 год. Локализацията на патологичния процес е, както следва: ларинкс (6), глотис (5), хипофаринкс (1), език (1), друга (1). Преобладаване на специфични IgG към HPV16 се установи при 7 (50%) от изследваните лица. Вирусна ДНК бе доказана при 6 (42%) от пациентите. Корелация между наличието на вирусна ДНК и имунния отговор е констатирана при 4 (30%) от всички изследвани лица. **Заключение.** HPV16 има преобладаващо значение в генезата на тумори на орофаринкс и ларинкс. Доказателство за среща с вируса са прилаганите в практиката различни методи за диагностика, както и серологичните проучвания на имунния статус на населението.

Ключови думи: ларинкс, орофаринкс, HPV 16, имуен отговор, real-time PCR

Abstract. The aim of this study was to establish the prevalence of IgG antibodies to HPV16 and to perform a DNA analysis, detection and quantitation by Real-time PCR of HPV16 in patients with malignancies in the oropharynx and larynx, and to establish a correlation between immune response and PCR diagnosis of the virus. **Material and methods.** We performed a prospective sero-epidemiological study of people hospitalized in the Clinic of Otorhinolaryngology, University Multiprofile Hospital for Active Treatment „Dr. D. Stransky“ – Pleven. Diagnoses were confirmed histologically. By using Human papillomavirus type 16 (HPV16) antibody, IgG ELISA

Nikolov A, Tzekova M, Kostov K, **Blazhev A.** (2020). Association between serum matrix metalloproteinase-12/angiotensin II profile and left ventricular hypertrophy in patients with heart failure. *Archives of the Balkan Medical Union*, 55(2), 233–242. <https://doi.org/10.31688/ABMU.2020.55.2.04> ISSN: 1584-9244 Scopus Q4 SJR₂₀₂₀ 0.145 (12 T.)

ORIGINAL PAPER

ASSOCIATION BETWEEN SERUM MATRIX METALLOPROTEINASE-12/ANGIOTENSIN II PROFILE AND LEFT VENTRICULAR HYPERTROPHY IN PATIENTS WITH HEART FAILURE

Asparuh G. NIKOLOV¹✉, Maria L. TZEKOVA², Konstantin M. KOSTOV², Alexander B. BLAZHEV³

¹Institute for Scientific Research, Cardiovascular Research Working Group, Medical University, Pleven, Bulgaria

²Department of Propaedeutic of Internal Diseases, Second Clinic of Cardiology, Medical University, Pleven, Bulgaria

³Division of Biology, Medical University, Pleven, Bulgaria

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ABSTRACT

Introduction. Matrix metalloproteinases (MMPs) are important target genes for angiotensin II (AII), which subsequently alters MMP expression in extracellular matrix (ECM) and lead to remodeling process.

Objective. To investigate whether an association between serum levels of MMP-12, AII and left ventricular hypertrophy exists in patients with heart failure with mid-range ejection fraction (HFmrEF) and arterial hypertension (AH).

Material and methods. 56 patients with HFmrEF and AH were examined, mean age 65.62±9.69 years, and 22 age and sex-matched healthy subjects, mean age 56.4±5.53 years. 41 patients had hypertension-mediated organ damage and 15 did not. Patients were divided in two subgroups: subjects with left ventricular hypertrophy (n=32), (HFmrEF+LVH), and subjects without left ventricular hypertrophy (n=24), (HFmrEF-LVH). ELISA was used for measuring AII and MMP-12.

RÉSUMÉ

Association entre le profil de la métalloprotéinase matricielle dans le sérum-12/angiotensine II et l'hypertrophie ventriculaire gauche chez des patients atteints d'une insuffisance cardiaque.

Introduction. Les métalloprotéinases matricielles (MMP) sont des gènes cibles importants pour l'angiotensine II (AII), qui modifie par la suite l'expression des MMP dans la matrice extracellulaire (ECM) et conduisent à un processus de remodelage.

L'objectif de l'étude a été de déterminer s'il existe une association entre les taux sériques de MMP-12, AII et l'hypertrophie ventriculaire gauche chez les patients atteints d'insuffisance cardiaque avec une fraction d'éjection moyenne (HFmrEF) et d'hypertension artérielle (AH).

Matériel et méthodes. 56 patients avec HFmrEF et AH ont été examinés, âge moyen 65.62±9.69, et 22

✉ Address for correspondence:

Asparuh NIKOLOV
Cardiovascular Research Working Group, Institute for Scientific Research,
Medical University, Pleven, Bulgaria
Address: St. Kliment Ohridski Str. 1, 5800 Pleven, Bulgaria
E-mail: a_nicoloff@yahoo.com; Phone ++359 887100672

Nikolov A, Popovski N, **Blazhev A.** (2021). Collagen type III to type I propeptides ratio is. Better indicator of early-onset preeclampsia than a single propeptide. *Annals of Clinical and Analytical Medicine*, 12(1), 92–98. <https://doi.org/10.4328/ACAM.20205> ISSN: 2667-663X **Web of Science Q4** IF2021 не се изчислява (12 т.)

Collagen type III to type I propeptides ratio is a better indicator of early-onset preeclampsia than a single propeptide

Collagen type III to type I propeptides ratio - an early onset preeclampsia indicator

Asparuh Nikolov¹, Nicola Popovski², Alexander Blazhev³

¹Cardiovascular Diseases Investigations, Institute for Scientific Research, Medical University of Pleven

²Clinic of Obstetrics and Gynecology, University Hospital Pleven, Medical University of Pleven

³Division of Biology, Medical University of Pleven, Bulgaria

Abstract

Aim: In this study, we aimed to investigate whether maternal serum levels of collagen propeptides N-terminal propeptide of collagen type III (PIIINP), N-terminal propeptide of collagen type I (PINP) and C-terminal propeptide of collagen type I (PICP) warrant further study as candidate biochemical markers for the development of early-onset preeclampsia. **Material and Methods:** The sera of 32 patients with early-onset preeclampsia (< 34 gestational weeks) were examined. The mean age of the patients was 28.8±5.5 years; and the mean age of 22 age-matched normal pregnant women was 28.5±6.0 years. The enzyme-linked immunosorbent assay (ELISA) was used for measuring collagen type I and III propeptides- PIIINP, PINP, and PICP.

Results: Serum levels of PIIINP in women with preeclampsia were significantly higher than in normal pregnancies (150.3±31.0 vs. 120.6±29.5 µg/L) (F=6.47, p=0.016). There were no significant differences between levels of PINP and PICP in preeclampsia women than normal pregnancies (18.7±5.5 vs. 18.8±6.7 µg/L) (p>0.05) and (10.9±3.8 vs. 10.5±2.9 µg/L) (p>0.05) respectively. Although type I procollagen levels were not significantly elevated in preeclampsia, the ratio of type III to type I procollagen in sera of patients with preeclampsia was significantly higher than normal pregnancy (PIIINP/PICP= 13.8 vs. 11.5 (t=-2.01, p=0.04)).

Discussion: Our data suggest an association between changes in levels of PIIINP and the development of early-onset preeclampsia. Determination of the PIIINP/PICP ratio may be a more useful method for monitoring the development and progression of early-onset preeclampsia than a separate collagen propeptide marker.

Keywords

Collagen Type I; Collagen Type III; Propeptide; Biomarkers; Preeclampsia

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Corresponding Author: Asparuh Nikolov, Interim Chair of Division of Pharmacotherapy, Cardiovascular Diseases Investigations, Institute for Scientific Research, Medical University, 1, 'St. Kliment Ohridski' Str., 5800 Pleven, Bulgaria.



E-mail: a_nicoloff@yahoo.com P: +359 887100672

Corresponding Author ORCID ID: <https://orcid.org/0000-0003-4289-5124>

Kostov K, & Blazhev A. (2021). Circulating levels of endothelin-1 and big endothelin-1 in patients with essential hypertension. *Pathophysiology*, 28(4), 489–495. <https://doi.org/10.3390/pathophysiology28040031> ISSN: 0928-4680 Scopus Q2 SJR₂₀₂₁ 0.431, Web of Science (няма наукометрия) (20 т.)

Article

Circulating Levels of Endothelin-1 and Big Endothelin-1 in Patients with Essential Hypertension

Krasimir Kostov ^{1,*}  and Alexander Blazhev ² 

¹ Department of Pathophysiology, Medical University-Pleven, 1 Kliment Ohridski Str., 5800 Pleven, Bulgaria

² Department of Biology, Medical University-Pleven, 1 Kliment Ohridski Str., 5800 Pleven, Bulgaria; yalishanda9@gmail.com

* Correspondence: dr.krasi_kostov@abv.bg; Tel.: +359-889-257-459

Abstract: The role of endothelin-1 (ET-1) in the pathogenesis of hypertension (HTN) is not clearly established. There is evidence that its circulating levels are elevated in some forms of experimental and human HTN, but this was not a consistent finding. Based on these controversial data, we tested serum levels of ET-1 and Big ET-1 (the precursor of ET-1) in patients with essential HTN, comparing the results with those of healthy normotensive controls. The levels of ET-1 and Big ET-1 were measured by ELISA. Our results in patients with essential HTN showed that the mean levels of ET-1 (5.01 ± 2.1 pg/mL) were significantly higher ($F = 6.34$, $p = 0.0144$) than the mean levels in the control group (3.2 ± 1.0 pg/mL). The levels of Big ET-1 in patients with essential HTN (0.377 ± 0.1 pmol/L) were similar to those in the control group (0.378 ± 0.07 pmol/L) and did not differ significantly ($F = 0.00$, $p = 0.9531$). These data suggest that ET-1, but not Big ET-1, may play an important role in the pathogenesis of primary HTN.





Citation: Kostov, K.; Blazhev, A. Circulating Levels of Endothelin-1

Keywords: essential hypertension; endothelin-1; big endothelin-1

Kostov K, & Blazhev A. (2022). Changes in Serum Levels of Matrix Metalloproteinase-1 and Tissue Inhibitor of Metalloproteinases-1 in Patients with Essential Hypertension. *Bioengineering-Basel*, 9(3), 119. <https://doi.org/10.3390/bioengineering9030119> ISSN: 2306-5354 Scopus Q2 SJR₂₀₂₂ 0.663, Web of Science Q2 IF₂₀₂₂ 4.6 (20 T.)

Article

Changes in Serum Levels of Matrix Metalloproteinase-1 and Tissue Inhibitor of Metalloproteinases-1 in Patients with Essential Hypertension

Krasimir Kostov ^{1,*}  and Alexander Blazhev ² 

¹ Department of Pathophysiology, Medical University-Pleven, 5800 Pleven, Bulgaria

² Department of Biology, Medical University-Pleven, 5800 Pleven, Bulgaria; yalishanda9@gmail.com

* Correspondence: dr.krasi_kostov@abv.bg

Abstract: Hypertension (HTN) is a leading risk factor for cardiovascular (CV) disease. Matrix metalloproteinases (MMPs) and their tissue inhibitors (TIMPs) are thought to be actively involved in the remodeling of the CV extracellular matrix (ECM) during hypertensive damage. Therefore, in this study, we aimed to investigate serum levels of MMP-1 and TIMP-1 in patients with essential HTN and compare them with those of normotensive individuals. We measured serum concentrations of MMP-1 and TIMP-1 in 60 patients with HTN and 20 healthy controls using an ELISA. The obtained results showed that in patients with HTN, the mean levels of MMP-1 (1.82 ± 0.9 ng/mL) were significantly higher ($p = 0.03$) than the mean levels in the control group (1.19 ± 0.7 ng/mL). The levels of TIMP-1 in patients with essential HTN (0.44 ± 0.1 ng/mL) were also significantly higher ($p = 0.005$) than those in the control group (0.33 ± 0.1 ng/mL). In HTN, elevated serum MMP-1 levels may be associated with increased collagen degradation in the CV ECM, whereas elevated TIMP-1 levels may favor its accumulation and the development of pathological remodeling and fibrosis of the heart and arterial vessels.

Keywords: essential hypertension; matrix metalloproteinase-1; tissue inhibitor of metalloproteinases-1



Citation: Kostov, K.; Blazhev, A. Changes in Serum Levels of Matrix Metalloproteinase-1 and Tissue Inhibitor of Metalloproteinases-1 in Patients with Essential Hypertension. *Bioengineering* 2022, 9, 119.

Petrov A, Karcheva M, **Blazhev A**, Gyokova E, Ivanova-Yoncheva Y, Popov I, & Petrova R. Seroprevalence of varicella zoster virus immunoglobulin g antibody among pregnant women in the Pleven region, Bulgaria. *Journal of IMAB*, (2019) 25(2), 2549–2552 <https://doi.org/10.5272/jimab.2019252.2549> ISSN: 1312-773X. **Scopus Q4 SJR₂₀₁₉ 0.108; Web of Science Q4, но няма IF (12 т.)**

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Original article

SEROPREVALENCE OF VARICELLA ZOSTER VIRUS IMMUNOGLOBULIN G ANTIBODY AMONG PREGNANT WOMEN IN THE PLEVEN REGION, BULGARIA

Anton G. Petrov¹, Milena D. Karcheva², Alexander B. Blazhev³, Elitsa H. Gyokova¹, Yoana Ivanova-Yoncheva¹, Iordan D. Popov¹, Rositsa V. Petrova⁴

1) Department of Obstetrics and gynecology, Medical University - Pleven, Bulgaria

2) Department of Epidemiology, Medical University - Pleven, Bulgaria

3) Department of Anatomy and biology, Medical University - Pleven, Bulgaria

4) Department of Hygiene, medical ecology, occupational diseases and disaster medicine, Medical University - Pleven, Bulgaria.

SUMMARY

The purpose of this study was to assess the immunity against *Varicella Zoster Virus* (VZV) among pregnant women in the Pleven Region, Bulgaria.

Material/Methods Cross-sectional study was carried out. After informed consent, 251 women were hospitalized in a Clinic of obstetrics and gynecology at the University hospital in Pleven, Bulgaria. From every participant 5 ml blood was obtained, and all serum samples were tested by Enzyme-linked immunosorbent assay (ELISA). NovaLisa Varicella-Zoster Virus (VZV), ELISA Kit (NovaTec Immunodiagnostica GmsH) for detection of VZV Immunoglobulin G (IgG) antibody and UVmax kinetic microplate reader were used. Demographic characteristics of participants were collected by interview. Data were managed in Microsoft Excel 2007 and analyzed using Statgraphics software.

Results VZV IgG antibodies positive were detected in 178/251 (70.92%) of the women. Forty-four (17.53%) of all women were VZV IgG antibodies negative, and 29/251 (11.55%) were considered as equivocal. In women up to 20 years of age (n=33), 19(57.57%) samples were positive. In women aged between 20 and 30 years of age (n=138), 99 (71.74%) positive samples were found. In women aged more than over 30 years (n=80), 59 (73.75%) were positive. In all three age groups sero-negative women were found, but the highest relative share was in the age group up to 20 years - 21.21%

Conclusions Seroprevalence of VZV serum IgG antibodies is comparatively high among pregnant women. Established seronegative women have a potential risk of natural infection and its transmission to the fetus.

Keywords: Varicella-Zoster Virus, seroepidemiology, pregnant women

INTRODUCTION

Varicella is the most common infection in Bulgaria. The etiological agent, *Varicella-zoster virus* (VZV), is transmitted by air-borne route or direct contact with infectious lesions. In the absence of vaccination, the annual number of varicella cases is high. In 2017, in the public databases of the National Centre of Infectious and Parasitic Diseases were registered 25007 new cases in the country (incidence rate 352.12/100,000) [1]. Varicella represents 47.73% of all infectious diseases. It is a highly contagious disease, with a secondary attack rate of 90% in close contacts. In the countries with temperate climate most of the people become infected before adulthood, but about 10% of young adults remain susceptible. The most useful indicator for past infection is the presence of specific serum antibodies. In the European countries, which have not included the vaccine in their immunization program, antibodies to VZV are generally acquired before 10-15 years of age [2, 3, 4].

After primary infection, VZV has the capacity to persist as a latent infection and reactivation of virus may to cause herpes zoster. The illness usually had a good outcome, but complications are also observed - secondary bacterial infections of skin lesions, pneumonia, aseptic meningitis or encephalitis, cerebral ataxia and other.

Pregnant women and those with a suppressed immune system are at highest risk of serious complications. Women who are immune to varicella cannot become infected and do not need to be concerned about it for themselves or their infant during pregnancy. The acquisition of maternal antibodies protects the infant during the first few months of life. Varicella infection in pregnant women could lead to viral transmission via the placenta and infection of the fetus. If infection occurs during the first 28 weeks of gestation, this can lead to fetal varicella syndrome which may occur in nearly 2% [5]. Possible problems include: damage of the brain (encephalitis, microcephaly, hydrocephaly, aplasia of brain), damage of the eye (optic stalk, optic cap, and lens vesicles), microphthalmia, cataracts, chorioretinitis, optic

Georgiev A, Karcheva M, **Blazhev A**, Popov I, Dimitrova N & Gyokova E. Seroprevalence of parvovirus B19 IgG antibodies among pregnant women. General Medicine, (2020) 22(2), 3–6. [Георгиев А, Карчева М, **Блажев А**, Попов Й, Димитрова М, & Гьокова Е. Разпространение на Parvovirus B19 IgG антитела при бременни. Обща медицина, (2020) 22(2), 3–6.] ISSN: 1311-1817 Scopus Q4 SJR₂₀₂₀ 0.111 (12 т.)

Авторски статии

РАЗПРОСТРАНЕНИЕ НА PARVOVIRUS B19 IgG АНТИТЕЛА ПРИ БРЕМЕННИ

A. Георгиев¹, М. Карчева², Ал. Блажев³, Й. Попов¹, М. Димитрова¹, Е. Гьокова¹

¹Катедра „Акушерство и гинекология“, МУ – Плевен

²Сектор „Епидемиология“, МУ – Плевен

³Сектор „Биология“, МУ – Плевен

SEROPREVALENCE OF PARVOVIRUS B19 IgG ANTIBODIES AMONG PREGNANT WOMEN

A. Georgiev¹, M. Karcheva², Al. Blazhev³, I. Popov¹, M. Dimitrova¹, E. Gyokova¹

¹Department of Obstetrics and Gynecology, Medical University – Pleven

²Department of Epidemiology, Parasitology and Tropical Medicine, Medical University – Pleven

³Department of Biology, Medical University – Pleven

Резюме. Цел на настоящото проучване е да се установи честотата на разпространение на Parvovirus B19 IgG антитела при бременни. **Материал и методи.** Проведено е проспективно сероепидемиологично проучване. Изследвани са серуми за Parvovirus B19 IgG антитела. Приложен е ензимосвързан имуносорбентен анализ (ELISA). Използва се NovaLisa Parvovirus B19 IgG ELISA Kit (NovaTec Immunodiagnostica GmsH, Германия). Анализирани са серумни проби от 242 бременни, хоспитализирани в Клиника по акушерство и гинекология, Университетска болница „Д-р Г. Странски“ – Плевен. **Резултати.** Резултатите са интерпретирани съгласно препоръките на производителя. Седемдесет и три (30.17%) от изследваните проби са положителни (над 11 NTU). Преобладаващи са отрицателните (по-малко 9 NTU) проби – 168 (69.42%), а една (0.41%) е двусмислена (9-11 NTU). Не се установиха значимите разлики в зависимост от възрастта ($p > 0.05$). **Заключение.** Това проучване установи висока възприемчивост на бременни жени към B19V. Препоръчваме провеждане на серологично изследване при бременни с усложнения и неблагоприятни последици от бременността, както и при други високорискови групи.

Ключови думи: Parvovirus B19, бременност, B19 IgG антитела, преваленс

Abstract. Our objective was to determine the seroprevalence of Parvovirus B19 IgG antibodies among pregnant women. **Material and methods:** A prospective seroepidemiological study was carried out. The Parvovirus B19 IgG antibodies were determined in serum samples. Enzyme-Linked Immunosorbent Assay (ELISA) was applied. NovaLisa Parvovirus B19 IgG ELISA Kit (NovaTec Immunodiagnostica GmsH, Germany) and UVmax kinetic microplate reader were used. According to supplier instructions antibody levels greater than 11 NTU were considered as positive, 9-11 – equivocal, and lower than 9 NTU as negative. Serum samples from 242 pregnant women hospitalized in the Clinic of Obstetrics and Gynecology, University Hospital – Pleven, Bulgaria were analyzed. **Results:** Seventy-three (30.17%) of the samples tested were positive (over 11 NTUs), negative (less than 9 NTU) samples were 168 (69.42%), and one (0.41%) was equivocal (9-11 NTU). Highest frequency (35.48%) was detected in women of less 20 years of age and the lowest prevalence (28.47%) was detected in women between 20 and 30 years of age (table 1). No significant difference was found depending of age ($p > 0.05$). **Conclusion:** This study found a high susceptibility of pregnant women to the B19V. We recommend conducting serological survey in pregnant women with complications and adverse outcomes of pregnancy, as well as in other high-risk groups.

Key words: Parvovirus B19, pregnancy, B19 IgG antibodies, prevalence

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ПРОСПЕКТИВНО ПРОУЧВАНЕ ВЪРХУ РАЗПРОСТРАНЕНИЕТО НА ЦИТОМЕГАЛОВИРУСНА ИНФЕКЦИЯ ПРИ БРЕМЕННИ

A. Георгиев¹, М. Карчева², Й. Иванова-Йончева¹, М. Димитрова¹, Й. Попов¹, Т. Рашев³, А. Блажев⁴,
Р. Василева⁵, М. Стойновска⁵

¹Катедра „Акушерство и гинекология“, МУ – Плевен

²Сектор „Епидемиология, паразитология и тропическа медицина“, МУ – Плевен

³Сектор „Молекулярна биология“, Университетска лаборатория за научни изследвания, МУ – Плевен

⁴Сектор „Биология“, МУ – Плевен

⁵Сектор „Медицина на бедствените ситуации“, МУ – Плевен

PROSPECTIVE STUDY OF THE PREVALENCE OF CYTOMEGALOVIRUS INFECTION IN PREGNANT WOMEN

A. Georgiev¹, M. Karcheva², Y. Ivanova-Yoncheva¹, M. Dimitrova¹, J. Popov¹, T. Rashev³, A. Blazhev⁴,
R. Vasileva⁵, M. Stoynovska⁵

¹Department of Obstetrics and Gynecology, MU – Pleven

²Department of Epidemiology, Parasitology and Tropical Medicine, MU – Pleven

³Molecular Biology Sector, MU – Pleven

⁴Department of Biology, MU – Pleven

⁵Disaster Medicine Sector, MU – Pleven

Резюме. Целта на настоящото проучване е да се установи честотата на разпространение на цитомегаловирусна инфекция чрез серологични и молекулярнобиологични методи при бременни жени. **Материал и методи.** Извършено е проспективно сероепидемиологично проучване на 240 бременни, хоспитализирани в Клиника по акушерство и гинекология, УМБАЛ – Плевен. Жените са разделени в две групи: първата – със запазена бременност (n = 200), а втората – с аборт (n = 40). На всички са изследвани серумни цитомегаловирусни IgM и IgG антитела чрез имуноензимен метод ELISA (enzyme-linked immunosorbent assay). Жените, чиято бременност е завършила с аборт, са изследвани допълнително за наличие на CMV DNA в абортивния материал чрез полимеразна верижна реакция (PCR). **Резултати.** От всички изследвани серумни проби CMV IgG (+) са 215 (89.6%), CMV IgM (+) са 66 (27.5%). Серопозитивни за двата маркера са 59 (24.58%), а серонегативни за двата маркера са 11 (4.58%) от изследваните проби. От взетия абортивен материал CMV DNA (+) са 8 (20%) от изследваните проби. Не се установи зависимост между наличието на вирусна DNA и CMV IgG/IgM позитивност при изследваните проби. **Заключение.** Установена е висока честота на разпространение на CMV IgG/IgM сред бременните и висока честота на вирусна DNA в абортивен материал. Извършването на скринингови изследвания на всички бременни жени е от изключителна важност за опазване здравето на плода и новороденото.

Ключови думи: цитомегаловирус, бременност, CMV IgG/IgM антитела, CMV DNA

Abstract. The aim of this study is to determine the prevalence of cytomegalovirus infection by serological and molecular biological methods in pregnant women. **Material and methods.** A prospective sero-epidemiological study was carried out on 240 pregnant women hospitalized at the Clinic of Obstetrics and Gynecology,

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ORIGINAL PAPER

RUBELLA IMMUNITY IN A COHORT OF PREGNANT WOMEN – SEROLOGICAL SURVEY

Milena D. KARCHEVA^{1✉}, Anton P. GEORGIEV², Alexander B. BLAZHEV³

¹ Department of Infectious Diseases, Epidemiology, Parasitology and Tropical Medicine, Medical University-Pleven, Pleven, Bulgaria

² Department of Obstetrics and Gynecology, Medical University-Pleven, Pleven, Bulgaria

³ Department of Biology, Medical University-Pleven, Pleven, Bulgaria

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ABSTRACT

Introduction. Rubella is a worldwide contagious disease with self-limited symptoms and a generalized rash. Epidemiology of rubella changed after licensing the vaccine in 1969. Children's rubella is a self-limited infection, but when it occurs during pregnancy, there is a risk of severe damage to the fetus.

Objectives. The aim of this study was to determine the immunity against rubella virus in pregnant women in Pleven Region, Bulgaria.

Methods. A cross-sectional study was carried out on pregnant women hospitalized in a Clinic of obstetrics and gynecology, University Hospital-Pleven, Bulgaria. Quantitative determination of specific Immunoglobulin G (IgG) antibodies against rubella virus was performed by Enzyme-Like Immunosorbent Assay (ELISA). Data were analyzed using the Microsoft Office Excel 2007 software.

Results. Between January 2018 and December 2018 there were collected and tested to Rubella virus IgG antibody 242 serum samples. Two hundred and four (84.30%) of them were positive, 29 (11.98%) were negative and 9 (3.72%) – equivocal. The age of examined

RÉSUMÉ

Immunité contre le virus de la rubéole chez un groupe de femmes enceintes- étude sérologique

Introduction. La rubéole est une maladie contagieuse à l'échelle mondiale aux symptômes légers et une éruption cutanée généralisée. L'épidémiologie de la rubéole a changé après l'autorisation du vaccin en 1969. La rubéole chez les enfants représente une infection spontanément résoluble, mais lors d'une grossesse le fœtus risque d'être gravement atteint.

Objectifs. Le but de cette recherche est d'évaluer l'immunité contre le virus de la rubéole chez les femmes enceintes dans la région de Pleven, Bulgarie.

Méthodes. Une recherche transversale a été conduite incluant des femmes enceintes hospitalisées au Département d'obstétrique-gynécologie de l'Hôpital Universitaire de Pleven, Bulgarie. Une détermination quantitative des anticorps Immunoglobuline G (IgG) spécifiques contre le virus de la rubéole a été menée à l'aide de la méthode immuno-enzymatique ELISA. Le logiciel Microsoft Office Excel 2007 a été utilisé pour analyser les données.

✉ Address for correspondence:

Milena KARCHEVA
Department of Epidemiology, Parasitology and Tropical Medicine, Medical University-Pleven, Bulgaria
Address: Sv. Kliment Ohridski Str.no.1, 5800 Pleven, Bulgaria
Email: milena_karcheva@abv.bg; Phone: +35 964 884 208

women was between 14 and 45 years, average 27, $sd \pm 6.429$. We found high seropositivity within age group 21-30 years of age. The immunization status of the investigated women shows – unimmunized – 79, selectively immunized with one dose of monovaxin – 58, immunized with combined (measles, mumps, rubella) vaccine one dose – 82, with a double immunization schedule – 23. In each group there were seropositive women.

Conclusions. Data analysis shows that pregnant women have high immunity and a tendency for lower morbidity rates of acute rubella infection.

Keywords: rubella immunity, pregnancy, immunoglobulin G antibodies.

Abbreviations

Immunoglobulin G – IgG

Enzyme-Like Immunosorbent Assay – ELISA

Congenital Rubella Syndrome – CRS

Measles, Mumps, Rubella – MMR

Résultats. Dans la période janvier – décembre 2018, 242 échantillons de sérum ont été prélevés et analysés à la recherche des IgM spécifiques de la rubéole. 204 d'eux (84.30%) étaient positifs, 29 (11.98%) étaient négatifs et 9 (3.72%) – équivoques. Les femmes examinées étaient âgées entre 14 et 45 ans, 27 ans en moyenne, $sd \pm 6.429$. Une séroprévalence élevée a été constatée chez le groupe de 21-30 ans. Quant à leur statut de vaccination, 79 des participantes étaient non immunisées, 58 avaient reçu une immunisation sélective d'une dose de monovaxin, 82 étaient immunisées avec une dose de vaccine combiné (rougeole, oreillons, rubéole), 23 avaient fait partie d'un programme d'immunisation de deux doses. Dans chaque groupe il y avait des femmes séropositives.

Conclusions. L'analyse des données indique que les femmes enceintes ont une forte immunité et une tendance à un taux de morbidité plus faible de l'infection rubéolique aiguë.

Mots-clés: rubéole, immunité, grossesse, anticorps Immunoglobuline G.