



INTERNATIONAL MEDICAL SCIENTIFIC JOURNAL

ART OF MEDICINE



Founder and Publisher **North American Academic Publishing Platforms**

Internet address: <http://artofmedicineimsj.us>

E-mail: info@artofmedicineimsj.us

11931 Barlow Pl Philadelphia, PA 19116, USA +1 (929) 266-0862

Chief Editor

Dr. Pascual Izquierdo-Egea

Prof. Dr. Francesco Albano

Dr. Catherine J. Andersen

Prof. Dr. Sandro Ardizzone

Dr. Dmitriy Atochin

Prof. Dr. Antonio Aversa

Prof. Dr. Tamam Bakchoul

Prof. Dr. Pierre-Grégoire Guinot

Prof. Dr. Rainer Haak

Prof. Henner Hanssen

Roy G. Smith

Department of Molecular and Cellular Biology/Department of Medicine

Baylor College of Medicine

Houston, TX 77030, USA

Kalpesh Patel, MD

The Sydney Kimmel Comprehensive Cancer Center

Johns Hopkins Medical Institutions

Baltimore, MD, 21231, USA

Roy G. Smith

Department of Molecular and Cellular Biology/Department of Medicine

Baylor College of Medicine

Houston, TX 77030, USA

Khamdamov Bakhtiyor Bukhara State Medical Institute

Khamdamova Mukhayokhon Bukhara State Medical Institute

Available at <https://www.bookwire.com/>

ISBN: [978-0-578-26510-0](https://www.isbn-international.org/product/978-0-578-26510-0)

PLACENTAL HORMONES IN PREGNANT WOMEN WITH VARIOUS TYPES OF INJURIES.

Jabborov Ulugbek Uzokovich

Doctor of Medical Sciences, obstetrician-gynecologist of the Republican Perinatal Center of the Ministry of Health of the Republic of Uzbekistan .

Reimova Minayim Kulmurzaevna

obstetrician-gynecologist, department of gynecology, Karakalpak branch of the Republican Scientific Center for Emergency Medical Care.

Abstract: The placental hormones chorionic gonadotropin, progesterone and free estriol were studied in 65 pregnant women admitted to the Karakalpak branch of the RRCEM over the past 3 years. An analysis of injuries showed that 20 women (30.7%) received road accidents, 33 pregnant women (50.8%) - domestic injuries and 12 women (18.5%) - burns. According to the gestation period, 14 (21.5%) pregnant women were injured in the first trimester, 29 (44.6%) in the second trimester, and 22 (33.8%) pregnant women in the third trimester. There were 28 (43.1%) primigravidas , and 37 (56.9%) multiparous. In pregnant women with road accidents and burns, regardless of the gestational age, the content of β -CHG was reduced by 1.5 times compared with the control group. In the blood of women who had a road and thermal injury, regardless of gestational age, the content of progesterone was also significantly reduced by 1.5-2 times compared with the control group. A decrease in estriol by 1.5 times compared with the control group) was observed in women with road accidents and burns only in the first trimester of pregnancy. In pregnant women with domestic injuries, the indicators of chorionic gonadotropin, progesterone and estriol did not have statistically significant differences from the control group, regardless of gestational age.

Keywords: hormones chorionic gonadotropin, placental hormones, women, questionnaires, midwife education

Background: Road traffic accidents are responsible for 50% of all injuries during pregnancy and 82% of trauma-related fetal deaths. The main reason for this equates to improper use of seat belts. The lap belt must be placed under the dome of the abdomen and across the pelvis to reduce pressure on the uterus during a car collision [1].

Domestic violence during pregnancy has recently received attention in several publications in the scientific and lay literature [2,3,4]. Emergency room records show that 22-35% of women who present any complaints actually have injuries associated with physical abuse [5]. Some series report an incidence of domestic physical violence of 31.5% during pregnancy [6]. These numbers, together with increased public awareness, have allowed the introduction of domestic violence screening measures (questionnaires, midwife education) into antenatal care centers in the US and UK [7,8].

During pregnancy, new tissues and organs appear in the body of a woman that perform hormonal functions: decidual tissue, placenta, syncytiotrophoblast (outer

layer) and cytotrophoblast (inner layer). Hormones produced by the placenta are very similar to the hormones of the hypothalamus and pituitary gland, they can act in a paracrine way, influencing the response of the body both in the acute and late stages of injury. However, their role in this process has not been finally determined [9].

In Uzbekistan, over the past 20 years, an emergency medical service has been created, which is in a single organizational, managerial and scientific system with emergency gynecology units. Since then, all pregnant women with trauma of any origin have been concentrated in the RRCEM and its branches.

The aim of our study was to study the hormonal status sympathetic-adrenal and placental systems in pregnant women who have undergone various types of injuries .

Research materials:

The study included 65 pregnant women aged 19 to 37 years who were admitted on an emergency basis to the Karakalpak branch of the RSCEMC for 2020-2022. According to the gestational age in the victims, the pregnancy was from 7 to 39 weeks, while in the first trimester of pregnancy 14 (21.5%) were injured, in the second trimester - 29 (44.6%) and in the third trimester -22 (33.8%) women. There were 28 (43.1%) primigravidas , and 37 (56.9%) were multiparous.

According to the nature of the injuries, the patients were divided into the following main 3 groups: Group I - 20 pregnant women (30.7%) with road traffic injuries as a pedestrian, passenger and driver. Group II - 33 pregnant women (50.8%), with domestic injuries, including falls. II I - group - 12 pregnant women (18.5%), with various types of burns, both liquid and flame. Control group - 15 pregnant women without obstetric and somatic diseases.

Research methods: all pregnant women at the time of injury within 1-2 days were assessed the hormonal status of the placental system, such as chorionic gonadotropin, estriol and progesterone were determined in the blood serum. All hormonal studies were carried out in the laboratory of the private clinic " Grand Prime Medical » Nukus city. Blood sampling was carried out in pregnant women on the first or second day after the injury. The study was carried out by enzyme immunoassay on an enzyme immunoassay analyzer from MINDRAY MR -96 A "(China), test kits of the company" DS-IFA "(Russia). Hormone concentrations were determined automatically from a calibration curve and measured in nmol /L .

Statistical analysis: the results obtained were performed by conventional methods with the determination of the mean value (M) and the mean error of the arithmetic mean (m) using the Microsoft computer program Excel , with Student's t-test calculation for comparison of means. Differences were considered statistically significant at a significance level of $p < 0.05$.

Results and discussion: in the pathological course of pregnancy, a pronounced decrease in the content of β -CHG in the blood serum was noted, while it is indicated that a decrease in the concentration of β -CHG in the blood serum can lead to disruption of the processes of trophoblast implantation , or insufficient formation of progesterone receptors. This hormone is necessary not only for the maintenance and functioning of the corpus luteum, but also for a direct effect on local cellular

interactions by reducing cell proliferation and increasing the level of apoptosis in endometrial cells [10].

As shown by our studies in women with a physiological course of pregnancy (table No. 1), in peripheral blood, the maximum values of β -CHG at the end of the first trimester were revealed - 30915 ± 923 mIU / ml, then its gradual decrease is noted - up to 26837 ± 711 mIU / ml in the second trimester and by the end of pregnancy, its content decreases by almost 2 times - 17354 ± 462 mIU / ml.

Table-#1

Indicators of the content of β -CHG in the peripheral blood of pregnant women at the time of injury

β -CG mIU / ml	Types of injury			
	car accident n =20	household n =33	Thermal n =12	Control n=1 5
1st trimester	n = 6	n = 7	n = 1	n =5
	20840±628*	31000±421	19000±950*	30915±923
2nd trimester	n = 8	n = 13	n = 8	n = 5
	15469±612*	24751±347	16245±248*	26837±711
3rd trimester	n = 6	n = 13	n = 3	n = 5
	9634±237*	16784±123	9467±451*	17354±462

Note: * - significance of differences in indicators compared with the group of women with physiological pregnancy ($p \leq 0.001$; Mann-Whitney C-test)

In all pregnant women who had an injury, regardless of the trimester at the time of the injury, the content of β -CHG was reduced by 1.5 times compared with the control group ($p \leq 0.001$), which indicated a decrease in the compensatory capabilities of the chorion and placenta. The exception is pregnant women with household trauma, in whom the content of β -CHG did not have statistically significant differences from the control group ($p \geq 0.05$).

An integral assessment of intersystem relationships between indicators of hormonal and immune status in pregnant women at the time of injury revealed a high direct correlation between β -CH and progesterone ($r=0.87$; $p<0.01$), β -CH and estriol ($r = 0.83$; $p<0.01$), which indicated its effect on the hormone-forming function of the corpus luteum in pregnant women in the first trimester and the developing placenta in early gestation .

Particular attention is drawn to the content of progesterone in the blood. One of the pathogenetic factors underlying the formation of miscarriage is insufficient production of progesterone. We have studied the content of progesterone in the blood serum of pregnant women at the time of the injury (Table No. 2).

Table-#2

Progesterone levels in pregnant women at the time of injury and gestational age

Progesterone	Types of injury
--------------	-----------------

nmol / l	car accident n =20	household n = 33	Burns n = 12	Control n = 15
1st trimester	n = 6	n = 7	n = 1	n = 3
	26.0±1.73*	48.6±2.17	25.03±1.7*	57.7±2.20
2nd trimester	n = 8	n = 13	n = 8	n = 3
	74.4±3.02*	117.7±3.10	73.3±0.9*	120.3±4.50
3rd trimester	n = 6	n = 13	n = 3	n = 3
	123.7±3.14*	208.8±2.16*	117.2±0.8*	357.8±5.11

Note: * - significance of differences in indicators compared with the group of women with physiological pregnancy ($p \leq 0.001$; Mann-Whitney C-test)

As our studies have shown in the blood of women who have suffered an injury, regardless of the trimester of pregnancy, the content of progesterone was significantly reduced by 1.5-2 times. Thus, in the first trimester, the level of progesterone in road traffic accidents was 26.0 ± 1.73 nmol / l, in thermal injury 25.03 ± 1.7 , respectively, compared with the control group - 57.7 ± 2.20 ($p \leq 0.001$). In pregnant women who were injured in the second trimester, this indicator was also significantly reduced and amounted to 74.4 ± 3.02 , 73.3 ± 0.9 and 75.1 ± 0.40 nmol / l, respectively, compared with the control group - 120.3 ± 4.50 nmol / l ($p \leq 0.001$). A similar picture was found in pregnant women who were injured in the third trimester - 123.7 ± 3.14 , 117.2 ± 0.8 and 127.3 ± 0.10 nmol / l, respectively, compared with the control group - 357.8 ± 5.11 nmol / l ($p \leq 0.001$).

Among pregnant women with injuries, there is a group of women who have experienced domestic injuries, in which the level of progesterone did not have statistically significant differences from the control group - 48.6 ± 2.17 nmol / l in the first and 117.7 ± 3.10 nmol / l in the second trimester ($p \geq 0.05$). However, in the third trimester at the time of injury, they had significantly low values - 208.8 ± 2.16 nmol / l compared with control.

Thus, the production of progesterone, especially at the beginning of gestation, is so important that its deficiency often leads to desynchronization of endometrial development and is in most cases the main cause of premature termination of pregnancy.

During pregnancy, the estrogen content progressively increases, and estriol is predominantly formed compared to estrone and estradiol. The level of estriol is an ideal indicator of the functioning of the feto-placental system. With the development of a pathological condition, the amount of the hormone changes before symptoms appear. In this connection, we studied the parameters of free estriol in the blood serum of pregnant women, which is important in our study in women with multiple injuries (Table No. 3).

Table-#3

Free estriol values in pregnant women at the time of injury and gestational age .

Estriol nmol /l	car accident n =20	household n = 33	Burns n = 12	Control n =15
1st trimester	n = 6	n = 7	n = 1	n = 5

	5.5±0.2*	7.8±0.6	5.03±1.7*	8.1±0.4
2nd trimester	n = 8	n = 13	n = 8	n = 5
	15.3±0.7	16.4±1.9	13.3±0.9	18.3±2.1
3rd trimester	n = 6	n = 13	n = 3	n = 5
	18.0±0.8	21.3±0.2	17.2±0.8	22.8±1.5

Note: * - significance of differences in indicators compared with the group of women with physiological pregnancy ($p \leq 0.001$; Mann-Whitney C-test)

It should be noted that significantly low values of estriol were established at the time of injury in women with road accidents and burns only in the first trimester of pregnancy compared with the control group - 1.5 times ($p \leq 0.001$). In the second and third trimesters, in pregnant women with road accidents and burns, as well as in the group of women with household injuries in all trimesters, the estriol index did not have significant differences from the control group ($p \geq 0.03$).

Due to the fact that the level of the hormone estriol is insufficient to maintain the function of the placenta, ensure homeostasis of the endometrium and myometrium, as well as the immune tolerance of the body of a pregnant woman, a decrease in the amount of steroid hormone against the background of an injury can have the most serious consequences - the threat of termination in the first half of pregnancy.

The direct mechanism for the development of spontaneous miscarriage or non-developing pregnancy, antenatal fetal death at various stages of pregnancy in women with injuries may be a decrease in the concentration of progesterone, estriol and β -CHG. This condition is due, in our opinion, to an increase in the content of cortisol in response to trauma, as a result, abortogenic cytokines are activated with the development of a systemic inflammatory response, which leads to fetal rejection.

Conclusions:

1. In all pregnant women who had an accident and burns, regardless of the gestational age, the content of β -CH was reduced by 1.5 times compared with the control group ($p \leq 0.001$), which indicated a decrease in the compensatory capabilities of the chorion and placenta. The exception is pregnant women with household trauma, in whom the content of β -CHG did not have statistically significant differences from the control group.

2. In the blood of women who had a road and thermal injury, regardless of the trimester of pregnancy, the content of progesterone was also significantly reduced by 1.5-2 times compared with the control group ($p \leq 0.001$). In the group of women who had domestic injuries in the 1st and 2nd trimester, the level of progesterone did not have statistically significant differences from the control group.

3. A decrease in estriol by 1.5 times compared with the data of the control group ($p \leq 0.001$) was observed in women with road accidents and burns only in the first trimester of pregnancy. In the second and third trimesters in pregnant women with accidents and burns, as well as in the group of women with household injuries in all trimesters, this indicator did not have significant differences from control indicators.

List literature:

1. Athiel Y, Vivanti A, Tranchart H. Splenic embolization for abdominal trauma during pregnancy. *J Visc Surg* . 2020;157(1):71–72.
2. Lyulko A.V. et al . Surgery for urogenital trauma. - Dnepropetrovsk. - 2004, - S. 56-5814
3. Nekrasova I.V. Sex steroid hormones of pregnancy as regulators of the functional activity of cells of the immune system : Ph.D. dis cand. biol. Sciences. - Chelyabinsk, 2013. - 24 p.
4. Committee on Obstetric Practice. Committee Opinion No. 723: Guidelines for Diagnostic Imaging During Pregnancy and Lactation. *Obstet Gynecol*. 2017;130(4): e210–e216.
5. Corwin MT, Seibert JA, Fananapazir G, Lamba R, Boone JM. JOURNAL CLUB: Quantification of Fetal Dose Reduction if Abdominal CT Is Limited to the Top of the Iliac Crests in Pregnant Patients with Trauma. *AJR Am J Roentgenol* . 2016;206(4):705–712.
6. Computed tomographic imaging interpretation improves fetal outcomes after maternal trauma. *J Trauma Acute Care Surg* . 2016;81(6):1131–1135.
7. Dan'kina IA, Dan'kina VV, Dan'kin KB, Chistjakov AA. Features of Traumogenesis in Pregnant Patients with Polytrauma. *Bulletin of Urgent and Recovery Surgery* . 2020;5(1):59–62.
8. Houseman B, Semien G. StatPearls [Internet]. Stat Pearls Publishing; Treasure Island (FL): Sep 25, 2022. Florida Domestic Violence.
9. Olasveengen TM, Sunde K., Brunboeg C. et al. Intravenous drug administration during out of hospital cardiac arrest: a randomise trial // *JAMA*. 2009. No. 302. pp . 2222-2229
10. Demidova E.M., Radzinsky V.E., The significance of local cellular interactions in the endometrium during non-gestation// *Issues of obstetrics, gynecology and perinatology* 2006. T5. No. 1. pp.67-74