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Our Experience in Drug-Free Prevention of Bedridden Hypotensive Syndrome of Pregnant Women During Surgical Interventions Due to Primary Chronic Venous Disease Under Local Anesthesia

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ABSTRACT

Purpose

Due to the increase in the number of non-obstetric surgical interventions during pregnancy under local anesthesia, surgeons have encountered such a pathology as supine hypotension syndrome of pregnancy (SHSP). This pathology was described by Howard R. et al. (1953). It occurs only in pregnant women, starting from the middle of the 11th and throughout the 111th trimester. It is manifested by a decrease in blood pressure (BP) in pregnant women by 30-40% from the baseline within 2-10 minutes with corresponding clinical manifestations on the part of both the pregnant woman and the fetus. The pathology occurs in patients mainly lying on their back, less often sitting. According to various authors, this pathology occurs in 20-70% of this contingent of patients, from latent forms to hypotonic shock. The task is to develop and actively implement for safe surgical intervention under local anesthesia the position of the pregnant woman on the operating table as one of the factors for the prevention of SHSP. Material and methods. The analysis was performed on the basis of 780 non-obstetric surgical interventions in pregnant women in the 11th and 111th trimesters under local anesthesia for primary symptomatic varicose veins of the lower extremities in the saphenous, non-saphenous vein basins and in combination. All pregnant women during the surgical intervention were placed on the operating table in the starting position lying on their back with the tabletop turned 30 0 to the left, with both lower limbs bent at the hip and knee joints by 120 0, with the head and chest raised by 30 0. In this position, for 2-3 minutes, we observe the dynamics of BP on the brachial arteries, pulse rate and the presence of clinical manifestations of SHSP. Result In 98.3% of the operated pregnant women, no manifestations of SHSP were noted. In 1.7%, mild manifestations of SHSP were noted, which required turning the table to 45 0, at which the BP stabilized to the initial limits with the absence of clinical symptoms in pregnant women with this pathology. Drug therapy support was not required. Conclusion. The proposed position of the pregnant woman on the operating table stabilized blood pressure by minimizing compression by the pregnant uterus of the terminal section of the abdominal aorta and/or the initial section of the inferior vena cava due to its mixing to the left, which improved hemodynamics in these areas. Such a position is comfortable for patients and the surgeon to perform a full surgical intervention with the observance of elements of antiseptics. The postoperative period in the operated patients proceeded without signs of disruption of the course of pregnancy and intrauterine development of the fetus. Such a position of the pregnant woman can be recommended in bed to preserve pregnancy and prevent SHSP.

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Entry

Bedridden hypotensive syndrome in pregnant women is a fleeting, dynamic, individual in its subjective manifestations, multifactorial process for each pregnant woman in its occurrence and course. Its peculiarity is that, with timely detection, adequate prevention of development, does not negatively affect either the mother or the child.

Pregnancy is a natural physiological dynamic individual process against the background of a formed female body. In most pregnant women, the body is able to adequately ensure its vital activity and development of the fetus, taking into account the position (sitting, standing) and motor activity (static, dynamic). In some pregnant women, even a short-term stay in a static position, most often lying on your back, less often in a sitting position, reveals the imperfection, inefficiency of these mechanisms, the cardiovascular system, which is manifested by a sudden drop within 2-5 minutes of systolic blood pressure (SAT) below 80 mm Hg, with corresponding clinical and heme dynamic manifestations

in the pregnant woman and, accordingly, in the fetus, which arise and increase in them from the 20th week of pregnancy [1-5].

The first mentions of acute arterial hypotension in pregnant women lying on their backs were described by Hansen R. et al. in 1942, McRoberts W. Jr et al. in 1951 under the name of postural hypotension syndrome [6,7].

The term bedridden hypotensive syndrome in pregnant women was introduced in 1953 by Howard. B. K et al., Holmes F et al. According to these authors, bedridden hypotensive syndrome occurred in 8.2% - 11.2% of pregnant women lying on their backs [8,9]. They had a drop in systolic blood pressure of more than 30% and 3.6% by 40% of baseline, or hypotension of less than 80 mm Hg. Art [9,10].

This syndrome, of varying severity, according to other authors, occurs in 10-70% of pregnant women. The maximum severity of clinical manifestations of supine hypotensive syndrome is observed in 1-3% during the 111th trimester, especially from 36-38 weeks. Severe supine hypotensive syndrome in 70% of pregnant women can occur on the eve of childbirth, and in 11% of them it manifests itself in the form of a "translational shock" [11-14].

In addition, according to these data, in the 111th trimester, 17-70% of patients have subclinical manifestations of bedridden hypotensive syndrome in pregnant. In most cases, supine hypotensive syndrome is asymptomatic [13,15,16].

There are also erased forms of supine hypotensive syndrome, which are characterized by manifestation from terminal clinical manifestations on the part of a pregnant woman against the background of already functioning heme dynamic disorders, which leads to fetal hypoxia [17,18].

It is important that the manifestations of supine hypotensive syndrome can manifest themselves in a latent form, without subjective manifestation of this pathology, which limits the possibility of timely diagnosis of fetal distress with the help of traditional observation without the use of instrumental research methods [19].

In 8-19% of pregnant women, there is a variety of clinical symptoms of supine hypotensive syndrome on the part of the mother after 2-3 minutes. after the supine position and can reach their maximum by the 10th minute. In the form of dizziness, a feeling of lack of air, shortness of breath, sudden weakness, heart palpitations, noise and ringing in the ears, "sparks" in front of the eyes, a feeling of fear, loss of the field of vision, pre-cardiac pain, dizziness.

On the part of the child, in 1-3% of patients, with a drop in systolic blood pressure to 80 mm Hg and below, according to the subjective assessment of the mother, her more frequent and strong movements took place.

Long-term arterial hypotension of the mother negatively affects not only her body due to a decrease in cardiac output, but also on the condition of the child, reducing placental perfusion, reduction of uteroplacental blood flow, which leads to a decrease in the supply of O2 and the formation of adverse manifestations from the fetus in the form of bradycardia and acidosis [19]. Zhezha S.V. and other authors noted that pregnant women with supine hypotensive syndrome in the supine position compared to the position on the on the left side, cardiac hemodynamics indicators were reduced by 16.8%, in addition, at that time, the resistance index in the umbilical cord arteries increased by 11.6%, which was 1.15 times higher, and in the uterine arteries 0.96 times less than in the control group, which reflects changes in the parameters of its gas homeostasis [19-26].

The occurrence of this pathology in pregnant women is multifactorial, currently not fully understood. According to most authors, it is mainly associated with the individual structure of the main and collateral arterial and venous systems in the basin of the inferior vena cava and the terminal part of the aorta and iliac arteries, the structure and dynamics of changes in the spine in the lumbosacral region during pregnancy, hormonal influence, especially progesterone, the state of connective tissue, the peculiarities of the dynamics of the location of the uterus in the pelvis during pregnancy with multiple veins, multiple pregnancies, weight gain in a pregnant woman and the ratio of these factors to each other. A special place in the occurrence of this pathology is occupied by undifferentiated connective tissue dysplasia in pregnant women [19]. Some authors drew attention to risk factors that may contribute to the development of bedridden hypothesis syndrome, namely vegetative-vascular dystonia (30.2%), arterial hypertension (15.1%), overweight (22.6%), large fetal size (5.7%), multiple pregnancies (3.8%) [14,27-30].

Physiological pregnancy in the mother's body causes significant anatomical, functional and biochemical changes, including shifts in the biomechanics of the spine [31].

A woman's weight gain during pregnancy reaches up to 11-16 kg, which creates additional static and dynamic loads on the axial skeleton. Some authors draw attention to the fact that the uterus, which increases due to the growth of the fetus, deviates from the midline of the body and repeats the shape of the axis of the lumbosacral spine and is located most of its part to the convex side of the spinal arch. This position of the pregnant uterus leads to impaired blood flow in the uterine arteries [31-34].

According to the authors, the manifestations of supine hypotensive syndrome may be associated with individual anatomical features of the structure of the spine, namely the distance between T12 and S1, the degree of severity of lumbar lordosis L4 –L5, where both the aorta and the inferior vena cava are compressed by the pregnant uterus In addition, since pregnant women, being in a position on their backs, the tributaries of the inferior vena cava can be pinched by an enlarged uterus , which contributes to venous stasis in the system of veins that form the inferior vena cava, contributing to a decrease in regional oxygen saturation, which forms hypoxia of organs, tissues, including the fetus [9,35,36-38].

The greatest concern is the compression of the terminal aorta at the level of L, 4-5 (level of lumbar lordosis), common iliac arteries by the pregnant uterus lying on its back from 32 weeks of gestation and more, which prevents adequate uteroplacental blood flow, since the uterine arteries extend below the compression of arterial vessels, confirmed by various research methods [36-40].

An important role in the development of supine hypotensive syndrome is facilitated by both the rate and the magnitude of the increase in body mass index. Overweight is defined as an increase in body mass index of more than 25 kg/m2. Thus, in pregnant women with a normal body mass index, the indicator of supine hypotensive syndrome was 10.2%, with obesity - 18.6%, with morbid obesity - 34.4% The maximum number of complications was observed in pregnant women with pathological weight gain

(for pregnant women with initial body mass index less than 30 kg/m2 - an increase of more than 15 kg, and, accordingly, more than 30 kg/m2 - more than 7 kg). The authors noted that the combination of arterial hypotension in pregnant women with an increased body mass index negatively affects both the pregnant woman and the fetus due to a decrease in placental perfusion [10,41-43].

Extremely rare in pregnant women, inferior vena cava syndrome is due to the infrarenal absence of the inferior vena cava. This pathology is embryonic in origin. It occurs in 0.3% of the population and is diagnosed incidentally, as it is asymptomatic. Some authors suggest that some sonographic symptoms will help suspect this pathology: an increase in the diameter of the right ovarian vein up to 18 mm, expansion of the paraspinal veins in the lumbar region, varicose veins of the lower extremities, pronounced varicose veins of the parameterium [44-46].

In addition, according to some authors, during the examination, it is necessary to pay attention to the contingents of pregnant women with a hypokinetic variant of blood circulation, primary arterial hypotension, which occurs in 10% of pregnant women with hypochronotropia at rest, excessive sweating and other symptoms of vagotonia, which at critical moments become one of the factors in the absence of a compensatory effect on compromised venous return in conditions of supine hypotensive syndrome [27,31,47].

In this contingent of patients, according to the authors, the hypokinetic variant of blood circulation contributes to the occurrence of supine hypotensive syndrome of pregnant women, due to the limitation of the compensatory capabilities of the cardiovascular system [27,48].

There are Three Options for the Formation of Bedridden Hypotensive Syndrome of Pregnant Women

Option 1

Compression by the pregnant uterus in some women, in the supine position from the 20th week, is mainly the abdominal arterial vessels (terminal aorta and/or common iliac arteries) as a result of which blood pressure in the distal aorta and iliac arteries decreases, the blood supply to the uterus decreases with the possible development of uteroplacental insufficiency without clinical manifestations, on the part of the mother, symptomatically on the part of the child. Due to the compression of the distal abdominal aorta, iliac arteries, it causes a 30% decrease in blood flow in the distal parts of the aorta and iliac arteries, thereby reducing the perfusion of the placenta and blood circulation in the child, reducing oxygenation - the clinic of aortic syndrome is formed.

Option 2

Compression of the inferior vena cava by the gravid uterus prevails, which leads to a decrease in the outflow of venous blood from the lower half of the body, respectively, the venous return to the heart (preload) decreases, as a result of which cardiac output (afterload) decreases and arterial hypotension develops - inferior vena cava syndrome is formed. As a result, the blood supply to the uterus decreases, the adequate functioning of the uteroplacental complex deteriorates up to the development of uteroplacental insufficiency with the appearance of bradycardia and asphyxia in the fetus, and a pregnant woman has clinical manifestations of supine hypotensive syndrome of pregnant women in the form of hypotension, tachycardia, a feeling of lack of air, sweating, pallor of the skin, impaired consciousness. Compression of the inferior vena cava was reported by Runge H, noting the difference in venous pressures on the arm and lower limb, where it was higher with alignment in the postpartum period [49]. Compression of the inferior vena cava by the pregnant uterus to the spine reduces by 85% the outflow of blood from the distal parts of the inferior vena cava, causes a slowdown in venous blood flow in the lower extremities, an increase in venous pressure in them, and the deposition of blood, which contributes to changes in pressure gradients along the pathways of venous inflow to the right parts of the heart (intratissue-intra-abdominal-intrathoracic), which significantly affects the condition of the pregnant woman.

Option 3

The terminal part of the aorta and the initial section of the inferior vena cava are simultaneously compressed by the pregnant uterus, aortocaval syndrome is formed. This variant occurs most often, is more severe and manifests itself earlier [10,23,50-58].

The data obtained by various authors unanimously testified that the inferior vena cava is almost completely compressed, and the aorta partially in pregnant women lies on its back with the pregnant uterus and their lumen in the left-lateral position of the pregnant woman increases when tilting to the left only at 300 or more [2,3,58-67].

Today, this problem is relevant and occupies a special place in practical obstetrics, surgical practice when performing non-obstetric surgical interventions during pregnancy under local anesthesia, during diagnostic studies that require a long stay of a pregnant woman on her back and are one of the important factors influencing pregnancy, and on the results of planned non-obstetric surgical interventions performed under local anesthesia.

Based on the understanding of the occurrence of supine hypotensive syndrome of pregnant women, it is very important to create a set of measures, including non-drug measures, to prevent it, especially when pregnant women are on the operating table in the context of modern clinical practice [68].

For this, during clinical, diagnostic studies, surgical interventions, etc., various drug-free methods were formed for prevention and introduced into protocols. Common and basic is the initial placement of the pregnant woman in the left lateral position to maximize cardiac output and uteroplacental perfusion, calling it a therapeutic maneuver [14,69].

Thus, during magnetic resonance imaging of the study according to the protocol, after 24 weeks of pregnancy, it was recommended to place it on the left side at 300, thanks to a pillow placed under the right side of the pelvis in order to prevent supine hypotensive syndrome of pregnant women, with systolic blood pressure of 111/68 mm Hg. and below [70].

Also, in order to prevent supine hypotensive syndrome in surgical practice, since 1970, it has been recommended to turn the operating table 150 or more degrees to the left, such a position of a pregnant woman on the left side in surgical practice is not correct [14,71,72].

The American Heart Association recommends placing pregnant women on their backs with an inclination to the left by 27-300 using a Cardiff wedge to support the pelvis and chest with an evidentiary level of 11b [73,74].

A number of authors, in addition to the position of the patient on her back with a turn of the table deck by 150 or more, additionally use the Trendelenburg position [75].

Another option to prevent venous arrest to improve venous return and improve cardiac output is recommended by some authors the manual displacement of the uterus to the left instead of the position of inclination to the left by 30 degrees, which does not completely relieve compression of the inferior vena cava, but may, in their opinion, interfere with adequate excursion of the chest. Alternatively, manual displacement of the uterus, which promotes venous return and improves cardiac output. Recommendation with an evidentiary level of 1C [74-84].

According to the Cochrane Review, various options for compression of the lower extremities are also proposed, aimed at reducing the incidence of hypotension to prevent clinical manifestations of supine hypotensive syndrome of pregnant women: elastic bandaging of the lower extremities, pneumo compression (mechanical compression) with appropriate devices, lifting of the lower extremities in order to return the volume of blood deposited in the lower extremities to the systemic circulation [55,64].

There is no unanimous opinion among the authors about changing the position of the body of a pregnant woman in the prevention of supine hypotensive syndrome of pregnant women. A number of authors did not find a difference in hemodynamic indicators and did not find an effect on blood systolic pressure, average pulse rate. oxygen saturation from the position of the pregnant woman in bed on her back or on the left side at 450 [74].

As a result, the Cochrane review did not reveal an increase (as well as a decrease) in the frequency of hypotension when the operating table is tilted to the left, right, lowering the head end in comparison with a strictly horizontal position. However, the risk of hypotension was lower when the operating table was tilted to the left compared to the tilt to the right, as well as by manual displacement of the uterus to the left compared to the tilt of the table to the left [77].

A feature of the supine hypotensive syndrome of pregnant women is that with the timely detection of pathology, turning the body to the left-lateral position by more than 200, as an option, manual displacement of the uterus to the left, or putting the supine hypotensive syndrome of pregnant women in a full lateral position disappears after 60 seconds without negative consequences, both for the pregnant woman and the child [14,44].

According to literature sources, the problem of supine hypotensive syndrome is encountered mainly by obstetricians and gynecologists during natural childbirth, anesthesiologists during anesthesia for cesarean section, resuscitators during resuscitation measures in pregnant women, dentists during the treatment of pregnant women with dental pathology, and specialists during MRI and CT examinations.

Vascular surgeons also encountered this problem during the open planned surgical treatment of primary chronic vein disease of the basin of saphenous and/or non-saphene veins lasting up to 1 hour under local anesthesia during pregnancy. Taking into account the fact that most often pregnant women have hidden forms of manifestations of supine hypotensive syndrome, against the background of the fact that some physiological processes in the body of a pregnant woman proceed in a special way, with the requirement that during anesthesia, the blood supply to the uterus should not be disturbed in any case, and premature birth is unacceptable, since it is one of the causes of fetal death, therefore, surgical interventions should be performed in an obstetric hospital with its diagnostic capabilities, specific observation of the pregnant woman and the child, multidisciplinary management of these patients, both before and in the postoperative periods [70].

In the literature sources available to us, there are no data on the frequency, severity, manifestations of supine hypotensive syndrome of pregnant women at different times with primary chronic venous disease in the saphenous, non-saphene and combined venous basins during surgery. The role and effectiveness of the drug-free so-called "therapeutic maneuver" in preventing or minimizing the manifestations of this problem in pregnant women during non-obstetric surgical interventions has not been assessed.

The Purpose of the Study

To assess the effectiveness and safety of drug-free, namely due to the "therapeutic maneuver" to prevent or minimize the manifestations of supine hypotensive syndrome of pregnant women during surgical interventions due to primary chronic venous disease.

Material and Methods of Research

840 Pregnant women operated on under local anesthesia with primary chronic venous disease, as a complication of pregnancy, were studied for the frequency of supine hypotensive syndrome of pregnant women and the possibility of its drug-free prevention. In all operated patients, the starting position on the operating table on the back was partially modified by us with a catheterized vein of the left upper limb. Surgical interventions were performed after 26-28 weeks of pregnancy: in the 11th trimester 660 (78.52%) patients and 180 (21.48%) patients in the 111th trimester only on the basis of the municipal institution "Rivne Regional Perinatal Center" of the Rivne Regional Council. Pregnant women who gave birth in the first - 16 (12.5%), repeated (two or more pregnancies) - 824 (87.5%) patients. The age of patients is from 18 to 42 years.

Non-invasive heme dynamic monitoring was carried out in a pregnant woman, according to the protocol developed by us, due to the rhythm and heart rate, indicators of systolic, diastolic blood pressure on the brachial arteries, capillary blood oxygen saturation (SpO2), using the Mindray Data scope Passport V cardiac monitor, and in the child - by frequency, heart rate amplitude, the presence of decelerations, acceleration, uterine tone in a pregnant woman with the help of cardiotocography with the Sonicaid team care device with automatic analysis of the results of the study according to the Dawes-Redman program.

In all operated patients, duplex angioscan of the veins of the lower extremities (superficial and deep), veins of the inguinal canal and perineum was performed using an extra class device Land Wind Mirror 11 (Italy) with a linear sensor with a frequency of 8-10 MNZ.

In each of the operated patients, the anamnesis was studied for the presence of obvious and/or erased forms of bedridden hypotensive syndom of pregnant women during the course of this pregnancy or previous during instrumental examinations, visits to the dentist that were associated with body position (lying down, sitting), at what time and at what number of pregnancies, during anesthesia, including during caesarean section in previous pregnancies and what symptoms manifested themselves (sudden decrease in blood pressure, dizziness, nausea, pallor, tachycardia, changes in fetal behavior, excessive sweating).

All operated patients paid attention to the presence of concomitant pathology.

Statistical processing of the material was carried out using the Statistic A 5.0, MS Excel XP application package. The results obtained are presented in the form of absolute and relative values, averages with standard deviations. The significance of quantitative data differences was assessed using Student's t-criteria.

Results and their Discussion

All 840 pregnant women with primary chronic venous disease were operated on under local anesthesia with our modified starting position on the operating table: the patient is on her back, the table deck is turned 15-200 to the left, only the head end of the operating table is raised by 40-450, the lower limbs in the knee joints are bent by 10-200 and up to 1200 in the hips by placing a roller in the popliteal region. This position of the pregnant woman is more natural for them, aimed at reducing the tension of the anterior abdominal wall, thereby the uterus shifts slightly forward and to the left, which helps to reduce intra-abdominal pressure and pressure of the pregnant uterus on the terminal aorta and iliac arteries and/or the distal inferior vena cava and common iliac veins. It also provides satisfactory access for the surgeon to the inguinal areas (external inguinal rings, both on the right and left), the perineum and along the entire length of the lower extremities. (Figure 1).

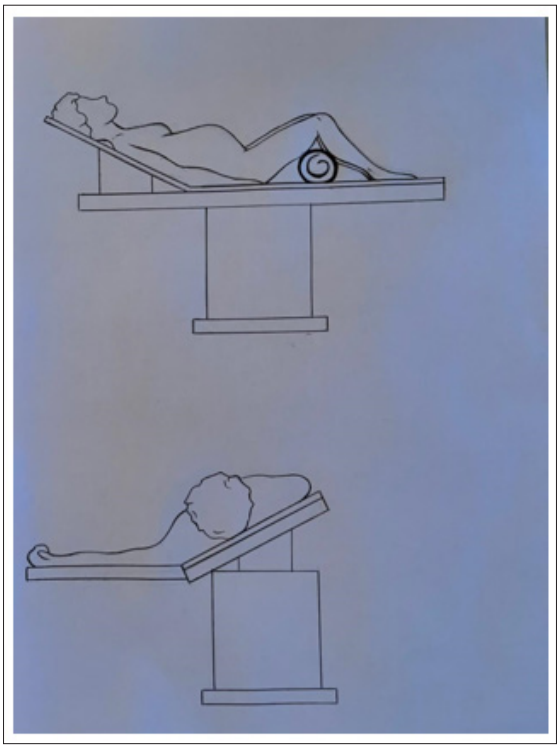

Figure 1: Position of a Pregnant Woman on the Operating Table.

According to the duplex scanning of the veins of the lower extremities, perineum and inguinal canal, all operated patients have deep veins of the lower extremities, iliac veins are passable. In 51.7% of pregnant women, the varicose process was localized in the basin of saphenous veins, in 33.33% - in the basin of non-saphene veins and in 15.2% in combined pools. Among 840 operated pregnant women, according to the CEAP classification, 443 (52.7%) had a clinical form of primary chronic disease of the veins -C2s, in 369 (47.14%)- C3s, in 1(0.12%) - C4s.

Bedridden hypotensive syndrome of pregnant women is fleeting, dynamic, individual in its subjective manifestations, multifactorial process for each pregnant woman in its occurrence and course. The peculiarity is that with timely detection, adequate prevention of development does not negatively affect either the mother or the child.

For this purpose, we have developed a protocol according to which the operated patients have identified stages and stages and the frequency of examination at each of them Thus, in pregnant women, the rhythm and heart rate, indicators of systolic and diastolic blood pressure on the brachial arteries, capillary blood oxygen saturation (SpO2) were assessed once at the stage before surgery in patients admitted to the hospital (control indicators), at the postoperative stage and at the stage of discharge from the hospital and continuous observation at the stage of surgical intervention with an interval of 1 minute with automatic recording of results. At this stage, the objective and subjective indicators of the pregnant woman on the operating table in the starting position for 2-5 minutes were assessed. The data obtained were compared with the pre-operational data. In case of symptoms of supine hypotensive syndrome, pregnant women were singled out for the stage of stabilization of the condition for 2-5 minutes due to the "therapeutic maneuver", and for the stage of surgical intervention.

The child's state of fetal cardiac activity (frequency and amplitude of heart contractions, the presence of decelerations, acceleration) was assessed once, recording cardiotocography for 10 minutes at the stage of admission to the hospital (control), at the stage 15 minutes before the intervention, and at the 15th minute. stage after surgery and at the stage of discharge from the hospital. Also, at each of these stages, the tone of the uterus was studied. Among 840 operated patients, 80 (9.52%) showed manifestations of supine hypotensive syndrome of pregnant women in the operating room in the initial position on the operating table (Table 1).

Table 1: Subjective Manifestations of Bedridden Hypotensive Syndrome of Pregnant Women (P-80).

Signs & symptoms	Number	%
1.Dizziness	24	30
2.sweating	12	15
3.nausea	14	17.5
4. Hypotension	80	100
5.pallor	12	15
6.Cold and clammy skin	10	12.5
7. Tachycardia	74	92.5
8.difficulty breathing	10	12.5

In 80 patients in 100%, against the background of a sharp decrease in systolic blood pressure within 2-5 minutes, there were clinical manifestations of supine hypotensive syndrome of pregnant women of different frequencies and in 95.3% there was a combination of them. In parallel with the rate and magnitude of the decrease in systolic blood pressure, the manifestations of bedridden hypotensive syndrome of pregnant women increased.

Analysis of pulse rate, its characteristics, values of systolic and diastolic pressures, blood oxygen saturation during the occurrence of supine hypotensive syndrome showed that pronounced dynamic changes within 2-5 minutes were noted only in a rapid decrease in systolic blood pressure from 26.3±0.5 mm Hg to 32.1±0.2 mm Hg. from the baseline, respectively, to 78.4 mmHg and 78.6±0.2 mmHg. Under. Other indicators for a short period of time underwent insignificant changes, within the range of up to 2.5% of the control ones (Table 2).

Table 2: Dynamics of Indicators: Pulse Rate, its Characteristics, the Value of Systolic and Diastolic Pressures, Blood Oxygen Saturation During the Occurrence of Supine Hypotensive Syndrome of Pregnant Women

Localization of varicose veins and quantity/%	Trimes three (quantity/%)	Systolic blood pressure(mmHg)		Diastolic blood pressure(mmHg)		characteristics (bpm) Pulse rate, its		Capillary blood saturation SpO2/%	
		Before surgery	During Bedridden hypotensive syndom	Before the operas	During surgery	Before the operas.	During the operas	Before the operas.	During the operas
Saphenovi 38 (%)	11-17 44.7%	115.2± 1.3	79.1± 1.2	80.2± 2.3	70.3± 0.3	Rhythm90.5±1.5	105.3±1.8	98.9±0.6	98.3± 0.3
	The value of changes in indicators/%		31.3±0.2. 21.17		9.3±0.7 11.6.		10.5±0.4. 11.6		0.3±0.20 0.3
	111-21/ 55.3%	129.3± 1.8	78.4±0.9	80.4± 0.3	69.3±0.1	95.4±2.5	108.3±0.9	98.3±0.6	98.1± 0.1
	The value of changes in indicators/%		26.3±0.5. 20.3%		10.2±0.2. 12.76		7.2± 0.4. 7.57		0.2± 0.1. 2.04
Not sapphire-24 (30%)	11-11(45.8	110.2±0.6	78.6±0.4	85.2± 0.2	79.3±0.3	99.2±06	112,2±0.3	99.1±0.2	98.3± 0.3
	The value of changes in indicators/%		32.1± 0.2. 29.12%		5.6±0.3. 6.57.		2.9± 0.7. 2.92		0.93± 0.1. 0.98
	111-13 54.2%	123.2± 0.2.	76.3±0.5	85.3± 0.3	79.2± 0.3	89.5±0.3	104.2±0.7	98.9±0.8	98.5 ±0.9
	The value of changes in indicators (%)		34.2. 27.76%		34.2. 27.76%		15.3±0.8. 17.09		0.9± 0.2. 0.9
Combined 18	11-7 38.89%	119.3± 0.3	77.3± 0.4	84.2± 0.3	70.2± 0.5	98.1±0.5	110.3±0.7	98.5±0.3	98.1± 0.5
	The value of changes in indicators/%		33.4± 0.4. 27.9		13.8± 0.3. 16.4		9.9± 0.1. 10.09		0.7± 0.9. 1.2
	111-11 61.1%	119.7± 0.4.	77.3± 0.3.	82.3± 0.4.	74.4± 0.5.	90.1±0.5	110.2±0.4.	98.5±0.3.	98.1 ±0.5.
	The value of changes in indicators/%		21.2± 0.1. 17.7%		8.7±0.8 10.57		10.3		0.4± 0.2

Note: M±SD is the mean of. ± the standard deviation of the mean; Min-max-minimum- maximum value. P – the correlation is significant at the level of ≤ 0.005

According to the analysis of hemodynamic indicators: pulse rate, its characteristics, values of systolic and diastolic blood pressures, blood oxygen saturation varied within 3%, the most dynamic indicator is a change in systolic blood pressure, especially during the occurrence of supine hypotensive syndrome of pregnant women.

It was important to identify the value of systolic blood pressure indicators in the manifestation of supine hypotensive syndrome of pregnant women to compare with the initial (control) indicators of systolic blood pressure. Thus, among 840 patients in the operating

room at the stage of stabilization, 65 patients had a drop in systolic blood pressure of less than 80 mm Hg in 80 (9.52%) during the stage of surgery, which was manifested by symptoms of supine hypotension syndrome of pregnant women (Table 3).

Table 3: Dynamics of Systolic Blood Pressure During Surgery Depending on the Initial Arterial Hisstolic Pressure (P=840)

Value of baseline systolic blood pressure/number of patients/%	Dynamics of systolic blood pressure during the intervention	Number of patients	Systolic blood pressure during surgery	% of the original
Normotension 115,5±1.3/ 662/78.91	No changes	551	115.6±0.7	-
	Raising systolic blood pressure	63	135.2±0.3	As of 13.04
	Drop in artillery pressure	48	77.6±0.9	At 33.81
Hypotension 90.3±0.5/ 77/9.17	No changes	44	90.5±0.3	
	Raise	12	100.2±0.5	On 11.3
	Fall	21	77.2±0.4	On 15.3
Controlled normotension 120.2±0.5/ 101/12.02	No changes	79	123.1±0.6	
	Raise	11	140.3±0.4	On 6.7
	Fall	11	78.1±0.3	As of 34.03

Note: M±SD is the mean of .± the standard deviation of the mean; Min-max-minimum- maximum value. P – the correlation is significant at the level of ≤ 0.005

The magnitude of the drop in systolic blood pressure also depended on the baseline (control) indicator of systolic blood pressure. Thus, in 77 pregnant women with hypotension, there was a drop in systolic blood pressure in 21 patients in relation to baseline by 15.3%, and among 662 pregnant women with normotension and in 101 pregnant women with controlled normotension, respectively, by 33.81% in 48 operated patients and by 34.04% in 11.

Among 840 operated women, 474 (56.89%) pregnant women were diagnosed with pronounced concomitant pathology: undifferentiated connective tissue dysplasia - in 52 (10.97%), condition after surgical delivery in 68 (14.34%): single - in 18 and in 50 - multiple (two or more), multiple pregnancies - in 4 (0.84%), multiple miscarriages 9 (1.9%). BMI over 25 kg/m2 - in 231 (48.73%), problems with the spine in the area L5 –S1 in 110 (23.21%). Most often, concomitant pathology in 98.3% of patients occurred in combination.

To analyze the frequency of manifestations of supine hypotensive syndrome of pregnant women, depending on the presence of concomitant pathology, two groups of patients were identified among 840 operated patients. The first group of 474 (56.89%) with calligraphically significant concomitant pathology and the second group of 356 (42.38%) without pronounced pathology. The frequency of supine hypotensive syndrome in the first group of patients was diagnosed in 59 (12.45%) (Table 4).

Table 4: Frequency of Manifestations of LGSV Depending on Concomitant Pathology (P-474)

Concomitant pathology	Number of patients/% 474/ 56.89	Number of patients with no manifestations of supine hypotensive syndrome / % (p-415/87.55		Number of patients with manifestations of supine hypotensive syndrome/% 59/12.45
Pathology of the spine L5-S1	110/23.21	94		16/14.54
A lot of	9/1.9	2		7/77.8
Multiple pregnancies	4/0.84	1		3/75
Undifferentiated connective tissue dysplasia	52/10.97	40		12/23.08
Postponed surgical delivery	68/14.34	Once 18/3.8%	15	3/4.41
		Reusable (two or more)/ 50/10.55%	45	5/7.35
Body mass index more than 25kg/m^2	231/48.73		113	12/5.19

Among pregnant women of the first group, the most common bedridden hypotensive syndrome of pregnant women occurred among patients in 77.8% with multiple pregnancies, in 75% with multiple pregnancies.

At the same time, among 356 (42.38%) pregnant women without pronounced concomitant pathology, the frequency of supine hypotensive syndoma of pregnant women occurred in 21 (5.9%) patients.

To study the frequency of manifestations of supine hypotensive syndrome of pregnant women from the complication of pregnancy with primary chronic disease of the veins of the lower extremities, perineum and inguinal canal, depending on the spread and localization of venous transformation, three groups of patients were identified for this. The first group of 432 (51.7%) patients with primary chronic venous disease in the saphenous vein basin, the second group of 280 (33.3%) patients with varicose transformation in the non-saphene vein basin and the third group of 128 (15.2%) in the combination of varicose veins. When analyzing the frequency of manifestations of supine hypotensive syndrome of pregnant women in these groups of pregnant women, the following was noted (Table 5).

Table 5: Frequency of Supine Hypotensive Syndrome of Pregnant Women Depending on the Basin of Primary Chronic Venous Disease (P-840)

Swimming pool	Number of patients	The presence of supine hypotensive syndrome of pregnant women		Absence of supine hypotensive syndrome of pregnant women	
		In the anamnesis	In operation.	History	In the operating room
Safene	432(51.7%)	44(10.20%)	38(8.8%)	289(66.9%)	394(91.20%)
Unsafene	280(33.3%)	32(11.43%)	24(8.57%)	249(88.93%)	256(90.43%)
Combined	128(15.2%)	24(18.75%)	18(14.96%)	96(75%)	110(85.93%)

Total 840(100%) 100(11.9%) 80(9.52%) 634 (75.48%) 760(90.48%)

Thus, according to the analysis, most often in 14.96% of patients with supine hypotensive syndrome of pregnant women was observed in patients with combined venous pathology, less often in 8.57% of patients with varicose veins in the basin of non-saphene veins. It was also noted that patients described anamnestically symptoms of supine hypotensive syndrome more often than those detected during surgery. Thus, according to anamnestic data, this pathology was described in 11.9% of patients, while according to objective and subjective data, it was found in 9.52% of operated patients.

It is important to identify the manifestations of supine hypotensive syndrome depending on the gestational age. (Table 6).

Table 6: Frequency of Supine Hypotensive Syndrome of Pregnant Women in Operated Patients Depending on Gestational Age (P-840)

Trimester of pregnancy	Number of patients (%)	Manifestations of supine hypotensive syndrome/%		There are no manifestations of supine hypotensive syndrome/%	
		History	In the operating room	History	In the operating room
11th trimester	660(78.57%)	60(12.12%)	12(10.33%)	520(78.78%)	592(89.70%)
111th trimester	180(21.43%)	94(52.22%)	68(30%)	130(72.22%)	126(70%)

Total 840 154(18.33%) 80(9.52%) 650(77.38%) 718(84.52%)

The data showed, most often, in 30% of pregnant women, lying hypotensive syndrome occurred in the 111th trimester. It was also noted that the number of pregnancies also affects its occurrence (Table 7).

Table 7: The Frequency of Manifestations of Bedridden Hypotensive Syndrome in Pregnant Women Operated on Depending on the Number of Pregnancies (P-840)

Number of pregnancies	Number of pregnant women/%	Manifestations of supine hypotensive syndrome of pregnant women/%
First pregnancy	16(12,5%)	16(1.9%)
Two or more pregnancies	824(87.5%)	64(4.61%)

Total 840 80(9.52%)

When analyzing the frequency of manifestations of supine hypotensive syndrome of pregnant women among operated women, depending on the number of pregnancies, it was noted that in pregnant women who had 2 or more pregnancies this pathology was 2.71% more likely than among those who became pregnant for the first time.

It was important to study the time of manifestation of supine hypotensive syndrome of pregnant women depending on the number of pregnancies (Table 8).

Table 8: Time of Manifestation of Supine Hypotensive Syndrome Depending on the Number of Pregnancies (P-80)

Number of pregnancies	Number of patients/%	Time of manifestation of supine hypotensive syndrome (min.)/number of operated		
		2 min	5 min.	10 min.
First	16(20%)	8(50%)	8(50%)	-
repeated(two or more)	64(80%)	24 (37.5%)	25 (39.07%)	15(23.43%)

Total 80 32 33 15

It was noted that in 16 (20%) pregnant women for the first time, bedridden hypotensive syndrome of pregnant women occurred only in the first 2 - 5 minutes, while among 64 (80%) pregnant women with repeated pregnancies in 15 (23.43%) it was noted during the first 10 minutes, manifested during the operation, which justified constant dynamic monitoring of hemodynamic parameters during surgery and required additional timely correction of the position of the pregnant woman's body on the operating table.

We paid attention during the analysis, and noted that the time of onset of supine hypotensive syndrome of pregnant women depends on both the trimester of pregnancy and the varicose transformation basin (Table 9).

Table 9: The Time of Manifestation of Bedridden Hypotensive Syndrome of Pregnant Women Depending on the Localization of Venous Transformation and Trimester of Pregnancy (P-80)

Localization primary chronic venous disease (quantity/%)	Trimesters of pregnancy (quantity/%)	Time of manifestation of supine hypotensive syndrome of pregnant women (min.)		
		2	5	10
Safene pool-38(47.5%)	11-17(44.74%)	6	7	4
	111-21(55.26)	8	10	3
Unsafe swimming pool -24(30%)	111-13(54.17)	5	4	4
Combined pools (saphenous and non-sapphene- 18(22.5%)	11 -7(38.89%)	4	2	1
	111-11(61.11%)	5	4	2

Total 80 32(40%) 33(41.2%%) 15(18.75%)

Among all 840 operated patients, 80 (9.52%) were diagnosed with bedridden hypotensive syndrome of pregnant women. In 32 (3.81%) patients, this syndrome developed during the first 2 minutes with different localization of the varicose process. Most often, this pathology developed in the 111th trimester - in 18 patients, less often in the 11th trimester in 14 pregnant women.

Accordingly, in 33 (3.93%) operated patients, pathology manifested itself in the 5th minute. In the 11th trimester in 15 patients, and in the 111th trimester - in 18.

Among 15 (1.79%) pregnant women at the 10th minute in the 11th trimester, pathology was noted in 6 pregnant women, and in the 111th trimester – in 7 patients. Most often, in 81.2% of operated patients, LGSV was noted in the first 5 minutes.

In 80 patients, bedridden hypotensive syndoma of pregnant women occurred in the first 2-5 minutes at the stabilization stage, being in the starting position on the operating table in the operating room, which required immediate, adequate correction of the position of the pregnant woman (Table 10).

Table 10: Additional Measures to Prevent Bedridden Hypotensive Syndrome of Pregnant Women (P-80)

Additional measures	Number
Additional rotation of the operating table deck by 20-250	68(85%)
Additional rotation of the operating table deck by 200 and rotation of the body - in total up to 500	12(15%)

These 68 (85%) patients needed additional rotation of the operating table deck and another 20-250 in total to 45-500, and 12 (15%) operated patients needed to additionally rotate the operating table deck by 200 and turn the torso to the left in total to 500 in order to change the position of the uterus in the abdominal cavity as much as possible.

Having studied the dynamics of fetal cardiac activity (frequency and amplitude of heart contractions, the presence of decelerations, acceleration) and uterine tone in a pregnant woman on the day of admission to the hospital, 15 minutes before surgery and 15 minutes after the end of surgery and upon discharge from the hospital, the following was noted (Table 11).

Table 11: Assessment of Cardiotocography Indicators (P-80)

CTG indicators	during admission to the hospital	15 minutes before surgery	15 min after surgery	At the time of discharge
Basal rhythm. (bpm).	130±9.3	130.1±9.4	140.4±1.5	135.2±1.3
Amplitude.	15.3± 3.9	16.8±2.5	15.5±1.5	14.3±0.9
acceleration	2 in 10 min recording of cardiotocography	6 in 10 min. cardiotography recording	8 in 10 min of cardiotocography recording	2 in 10 min recording of cardiotocography
deceleration	Missing	Missing	Missing	Missing
Uterine tone	Normotonus	Normotonus	Normotonus	Normotonus

Note: M±SD is the mean of. ± the standard deviation of the mean; Min-max-minimum- maximum value.

According to cardiotocography recorded for 10 minutes., among 840 operated pregnant women, including 80 in which episodes of supine hypotensive syndrome of pregnant women were noted, disturbances in the child's cardiac activity and uterine tone were not noted. There were no premature births, placental abruptions, no effect on the course of pregnancy, on the development of the child. According to the subjective assessment of the child's condition by pregnant women in the dynamics of the child's physical activity regime and the rhythm of his/her vital activity before the intervention, after the intervention and in the postoperative period in 92.3% of operated pregnant women without changes, only 7.3% of pregnant women during surgery noted an increase in the frequency and intensity of the child's movements, which stabilized by 2.5% by the end of the surgical intervention and in 4.7% in the postoperative period.

After correcting the position of the pregnant woman's body, the systolic blood pressure stabilized, the subjective state of the patient before the operating (control) for up to -2 minutes. Only after complete stabilization of objective and subjective indicators in comparison with preoperative (control) surgical intervention was carried out in the planned volume.

For the safety of the mother and child, taking into account the fact that some physiological processes in the body of a pregnant woman proceed in a special way, and premature birth is unacceptable, since it is one of the causes of fetal death, therefore, surgical interventions were performed in the obstetric hospital of the perinatal center with its diagnostic capabilities, specific observation of the pregnant woman and the child, multidisciplinary management of these patients, both before and in the postoperative periods [68].

All 840 patients were operated on under local tumescent anesthesia with a low-concentrated anesthetic (novocaine solution 0.25%) in a position on the left side with the care that during anesthesia the blood supply to the uterus should not be disturbed in any case.

Surgical interventions in the first group of pregnant women were performed in 432 (51.7%) patients: unilaterally - in 401 pregnant women, in 31 - bilaterally in one session. Of the 280 (33.3%) pregnant women of the second group, 225 patients underwent unilateral surgery due to inguinal varicose veins in 206, bilaterally in 19, and in 39 patients due to perineal varicose veins, mainly due to the internal pubic vein, 33 patients were operated unilaterally; bilaterally - 6, and 16 patients due to varicose veins of the inguinal canal and veins of the perineum (unilaterally - U10, bilaterally - in 6).

In the third group of 128 (15.2%) patients, surgical interventions were performed due to primary varicose veins of the saphenous veins and veins of the inguinal canal - 98 (unilateral - in 86; bilateral - in 12); saphenous veins, veins of the inguinal canal and perineum - in 19 pregnant women (unilateral - in 15; bilateral - in 4); saphenous veins and perineum-y 11 (unilateral-8, bilateral-3).

In 759 (89.88%) patients, unilateral surgical interventions were performed, in 81 (9.64%) bilaterally in one session.

Types of surgical presentations were performed in each patient individually, taking into account the pools of varicose transformation and their combination, and the data of ultrasound duplex Angio scanning.

In pregnant women of the first group, 432 (51.43%) surgical interventions were performed. The volume depended on the spread of varicose veins in the basin of saphenous veins and the capacity of perforating veins: in 120, surgical intervention variant CHIVA type 3 ,without intersection of the trunk of ERW; in 201 - combined with Mini phlebectomy according to Müller with removal of varicose conglomerates ; in 41 – variant of CHIVA type 3 ,without intersection of the trunk of the large saphenous vein was combined with suprafascial ligation of perforating veins on the thigh and/or lower leg without their intersection.

In the second group, 280 (33.3%) pregnant women were operated on. In 198 patients (unilaterally - in 186, bilaterally in one session - in 12) we used, we developed a surgical intervention for ligation of the veins of the inguinal canal in the area of the external inguinal ring, in 43 - ligation of the internal pubic vein in the area of the outer ring of the Alcocca canal without removal of varicose conglomerates (in 33 cases unilaterally, in 10 - bilaterally), in 39 - ligation of the veins of the inguinal canal in the area of the external inguinal ring and the internal pubic vein in the area of the external ring Alcocca canal without removal of varicose conglomerates (in 30 - one-sided, in 9 - bilaterally in one session).

In 128 pregnant women of the third group, surgical interventions were performed in the pools of saphenous and non-saphene veins. The combination of the CHIVA type 3 variant, without intersection of the ERW trunk, if necessary, was combined with Müller's Mini phlebectomy for the removal of varicose conglomerates and suprafascial ligation of perforating veins on the stagnium and/or lower leg without their intersection with ligation of the veins of the inguinal canal in the area of the external inguinal ring without intersection and removal of varicose conglomerates - 98 cases (unilaterally - in 86, bilaterally - in 12).

The combination of the CHIVA type 3 variant, without intersection of the trunk of the large saphenous vein, if necessary, was combined with Müller's miniphlebectomy for the removal of varicose conglomerates and suprafascial ligation of perforating veins on the stagnium and/or lower leg without their intersection

with ligation of the veins of the inguinal canal in the area of the external inguinal ring without intersection and removal of varicose conglomerates with ligation of veins in the area of the outer ring of the internal pubic vein without intersection and removal of varicose veins conglomerates - in 19 (unilaterally in 15, in 4 - bilaterally).

The combination of the CHIVA type 3 variant, without intersection of the trunk of the large saphenous vein, if necessary, was combined with Müller's miniphlebectomy for the removal of varicose conglomerates and suprafascial ligation of perforating veins on the stagnation and/or lower leg without their intersection with ligation of veins in the area of the external ring of the internal pubic vein without intersection and removal of varicose conglomerates in 11 patients (unilaterally in 8, bilaterally - y 3).

According to the analysis of objective indicators of hemodynamics by non-invasive methods in mother and child in 840 operated patients, it was shown that in 100% of operated premature births, complications of the course of pregnancy, fetal distress were not noted, thanks to the complex of measures formed by us: all surgical interventions were performed under tumescent anesthesia, a type of local anesthesia using a low-concentrated anesthetic (novocaine pH 0.25%), the position of a pregnant woman in the operating room developed by us Table; the use of low-traumatic pathogenetic hemodynamic surgical interventions; multidisciplinary management of these pregnant women; performing surgical interventions in an obstetric institution [85-88].

Conclusion

The frequency of supine hypotensive syndrome of pregnant women among 840 operated patients was noted in 80 (9.52%) patients who required additional correction of the position of the pregnant woman on the operating table due to the "therapeutic maneuver".

The frequency of manifestations of supine hypotensive syndrome of pregnant women in operated pregnant women is influenced by both the localization of the varicose transformation basin, trimester and number of pregnancies and concomitant pathology.

After correcting the position of the pregnant woman on the operating table, according to the data of an objective study and a subjective assessment of the operated person's condition, stabilization of objective and subjective indicators for up to 1-2 minutes was noted.

Without negative consequences for both the pregnant woman and the child

In the operating room, pregnant women with manifestations of supine hypotensive syndrome of pregnant women at the stage of stabilization of the pregnant woman's condition in order to bring objective and subjective indicators to the control ones, corrected her position on the operating table for 1-2 minutes, after which at the stage of surgical intervention, patients did not need medical support, and in the postoperative period

Thanks to the use of the "therapeutic maneuver" modified by us in the prevention of supine hypotensive syndrome, it made it possible to perform surgery in the planned volume under local anesthesia due to primary chronic venous disease for all 840 pregnant women, according to the indications without drug prevention of these problems.

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