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TREATMENT EFFICIENCY STUDY OF VARIOUS TYPES OF ARTERIAL HYPERTENSION DURING PREGNANCY TO REDUCE THE RISK OF DEVELOPMENT OF GESTATION AND PERINATAL COMPLICATIONS

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ABSTRACT

The article discusses the risk of developing the most significant gestational and perinatal complications, such us preterm labor, cerebral ischemia of newborns, prematurity, small birth weight of newborns and perinatal mortality in pregnant women with different types of arterial hypertension. Basic factors exerting an influence on instant risk of developing the most significant complications of pregnancy and labor, and also significant and independent predictors of their development have been defined.

KEYWORDS: *arterial hypertension, pregnancy, prognosis of development gestational and perinatal complications.*

INTRODUCTION

Until recent, it was considered that arterial hypertension (AH) is relatively rare among people younger age of 30. But in last years` surveys showed increase of elevated blood pressure up to 23.1% at 17-29 age group population. Thus, early established AH is one of factors leading to development of adverse outcomes. Also, important to note that people asking for medical advice is relatively too small compared to people found with AH during mass screening. This is due to most of them feel not different that healthy ones during the early stage of disease, therefore they never seek medical consultation regarding their condition. The same said above may be a reason why more and more woman found about their status only during their pregnancy, which makes it harder to diagnose and treat them appropriately. That is why it is not hard to mark this problem as one among important tasks of contemporary medicine. So we can relate it to two acute medical-social challenges of today: AH itself and reproductive health of the nation.

WHO reports hypertension as second cause of all deaths in the structure of maternal death structure, holding responsible about 30% of death cases.[1,7] This data of premature death (30%) and premature death (10%) among patients with AH outnumbers those who has not elevated blood pressure significantly. Hypertension occurs about in 5-15% of woman during gestation period[1-4], and holds increased risk of early normal placenta abruption, leading to cerebral blood circulation lesions, retina abruption, eclampsia and massive coagulopathic bleeding and other complications.[7,20] About in 30% cases AH already develops as Chronic AH, in 70% as Gestation AH and pre-eclampsia(PE) or eclampsia(E).[4] In pregnant woman with PE or E risk of serious complications (placental abruption, thrombocytopenia, disseminated intravascular coagulation, pulmonary edema, aspirated pneumonia) dramatically increased up to 3-25 times. This is how AH replaced first place reason of death cases in pregnant, also children who were born by such mother mortality had increased 5 times. Additionally, there is another risk of development known as retarded utero child growth, which in infancy holds 2 to 4 times increased mortality risk. In perinatal adverse outcomes, it is such factors are considered to have correlation: severity of AH, Ch-AH complication with eclampsia, proteinuria and high levels of serum creatinine, early forming G-AH during pregnancy, left ventricle hypertrophy and other target organ lesions.[3]

Physiological peculiarities of the cardiovascular system, developed during the period of pregnancy, sometimes, create such condition it is foggy to distinguish healthy changes from pathology. That is why this question needs accurate attention to provide treatment options for woman and during early antenatal period. Next principles of medical interventions are required to treat pregnant woman: prevent complication development due to high blood pressure, preserving normal pregnancy, adequate fetal growth, successful parturition and not influence lactation. AH treatment in pregnant woman

appears to be complex task, hence doctor cures two people simultaneously: mother and child. This may be exaggerated with fact that almost most group of drugs permeate thru the placenta, therefore may be potentially dangerous to the fetus with unfavorable effects. Besides, choosing for therapeutic tactics complicated with lack of evidence based medicine and research, as ethics dictates placebo controlled randomized researches evaluated seldom on pregnant woman. Till present no teratogenic effect of any antihypertensive drug was known, but there is lack of reliable data on this issue.[3,8]

Woman having Ch-AH or GAH requires changing lifestyle habits, such as lowering physical activity at work or home, but earlier recommended strict bed regimen did not give anticipated hypotensive results.[17] In addition, should not been lowered salt (down to 6 gr/day) and water intake due to hypovolemia risk. Also, it is not recommended to decrease body mass during pregnancy.[10]

Necessity in taking anti-hypertensive drugs in severe AH is without doubt. Anti-hypertensive therapy value in mild and medium heavy forms not evaluated, thus there is no commonly accepted standards established.[1,2] Research shows lowering BP is beneficial for mother, but in contrary, is undesirable for fetal-placenta blood circulation. At the same moment, fetal growth decline in uterus is risk factor for all negative outcomes of pregnancy.[6,7]

AIM of this article was evaluation of development of most common gestation and perinatal complications (premature parturition, fetus growth decline, premature birth and newborn low body mass, perinatal death) depending on type of AH in pregnant woman and choose of anti-hypertensive therapy, since there is lack of literature review and research regarding factors influencing said above complications.

MATERIALS AND METHODS

150 woman were included in research. Mean age was 30.5+-8.7, with various clinical types of AH, such as normal borderline BP-44(28.7%), Ch-AH 61 (39.8%), G-AH 48 (31.4%). Age in each subgroup was comparable and shown in Table 1.

Table 1: Age aspect of observed pregnant women.

Age	Total 150 (100%)		Borderline AH 44 (100)		Ch-AH 61 (100%)		G-AH 48 (100%)	
	n	%	n	%	n	%	n	%
19-20	7	4,5	3	6,8	1	1,6	3	6,2
21-25	28	18,3	8	18,2	10	16,3	10	20,8
26-30	41	26,8	13	29,5	21	34,4	7	14,6
31-35	51	33,3	13	29,5	24	39,3	14	29,2
36-40	18	11,8	3	6,8	5	8,2	10	20,8
41-45	8	5,2	4	9,1	-	-	4	8,3

Diagnostic verification was conducted with standard recommendations.[3,8] Clinical types of AH were distinguished based on clinical presentation, instrumental (BP measurement, daily BP monitoring, Echocardiography, ECG) and lab tests (cholesterol, uremic acid, creatinine, urea, proteinuria, and some other tests). Every patient tested for endothelial dysfunction with ultrasound brachial artery dilation method proposed by D.S. Celermajer.[9] All had taken clinical-laboratory check up and placenta-uterine, intrafetal and feto-placentar ultrasound and Doppler to evaluate blood circulation. Most significant data were included to evaluate the progress of pregnancy and its outcomes: early parturition (before full 37 week of age); rate of premature newborns; neonatal death; newborns in normal terms with mass deficit; perinatal death (rate of lost babies in utero starting from 22-week pregnancy till 7th day of life). Statistical analysis performed with application package Statistica 6.0 based on common accepted norms.

RESULTS AND DISCUSSIONS

Pregnancy unfavorable complications risk analysis in various AH clinical types indicates that the most adverse group by all indexes is patients with uncontrolled and increased BP. To accomplish this research`s aim we randomized all people under dynamic observation into 3 groups: 1 – borderline AH patients with 1-39th week of pregnancy; 2 – chronic AH, BP elevation before 20th week and persisting after parturition with tendency no increase further and 3 – pregnancy related AH, gestational AH, risk after 20th week with improving or disappearing after parturition. AH was divided in 3 levels of severity. applied pharmacotherapy included anti-hypertensive drugs with short acting group (niphedipine 5-10 mg in combination with metoprolol 25-50 mg) during II trimester only in Ch-Ah group when BP elevation episode occurred, after that on 26-28th week until labor prolonged drugs like amlodipine at 5-10 mg dose were prescribed. In case of tachycardia Metocard SR 23.5 mg/daily added to therapy and cancelled 2 weeks before expected labor. While in I trimester bed regimen and diet as non-pharmacologic therapy were prescribed, thus adding drugs only during clinical manifestation or BP elevation episode. Pregnant woman at or after 34th week with Ch-AH also managed the same way above in case of non-consent and only short acting drugs prescribed during BP elevation episode. If pre-eclampsia was diagnosed, term is not considered and woman were hospitalized to local facility with obligatory

Magnesium sulfate and anti-hypertensive therapy initiation during first hours.

During observation 5 (8.2%) patients before 22 weeks of gestation in Ch-AH group, 17 (35.4%) of G-AH group in 28-36 week term, 3 (7.3%) patients of borderline AH group in 22-34 week term had pre-eclampsia. During all pregnancy period risk of abortion was higher in Ch-Ah and G-AH group, 2.7 and 3.4 times, respectively in contrast to borderline group. In III trimester risk of early parturition reliably more found in pregnant woman with pre-eclampsia and Ch-AH. C-section rate also was reliably higher in Ch-AH and G-AH group, that was due to necessity of early intervention in term before 37th week of pregnancy.

Risk analysis number of gestational and perinatal complications such as fetus hypoxia, hypotrophy, fetus development and growth deficit (FDGD), birth of newborn with mass deficit at regular term, early parturition and perinatal death in different group of women with AH indicates that in all cases most adverse group was with Ch-AH and G-AH complicated with pre-eclampsia, what coordinates with results of other researches.[10, 13, 38] The highest risk of fetus development and growth deficit seen in women with Ch-AH (0.25+-0.09) and G-AH (0.07+-0.05). Regarding therapy to treat pre-eclampsia there is no consensus: some authors think conservative therapy is dangerous, others hold opinion of possibility of such therapy. Our data obtained from patients at 36-39th week of pregnancy shows low numbers of newborns without symptoms of brain ischemia (0.21+-0.11 for G-AH group and 0.45+-0.14), risk of development of such complication not only influenced by AH presence itself, but also duration of it. In addition, pre-eclampsia which may manifest with organ damage in mother, fetus and placenta. Proceeding to that, it demonstrates inexpediency of conservative care in pregnant with such lesion not only for mother but also for fetus too. Ch-AH women group characterized by quite high risk of such complication of FDGD, which made 0.09+0.02 at 36-39th week. While this index was 0.13+-0.04 at 36-37th week and 0.4+-0.11 at 38-39th week. This data constitutes that in patients who developed Ch-AH at early stage keeping pregnancy over 38th week comes with increased risk. Ch-AH at its 1st, also at 2nd grade severity comes with increased risk of FDGD. Thus, if 1st grade data observation at last month showed 0.08+-0.02, 2nd had 0.2+-0.04 increased risk. Obtained results dictates necessity of early delivery with severity increase. In such cases, highest risk of complications or abortion registered at 36-37th week of the term. Further continuing pregnancy with anti-hypertensives lowered such risk. When we estimated risk of FDGF development as momental complication, we found that AH severity, age, daily dose of metoprolol more than 50 mg were increasing, while taking amlodipine at 5-10 mg daily dose starting at early pregnancy lowered risk. What was concluded regarding Ch-AH, is that younger the age and lower systolic BP are the predictors of higher risk FDGD. Other research data supports this conclusion. Lower systolic BP giving some good leverage for mother may compromise placentar circulation, causing fetus development failure. It is another reason proving that it is not recommended to lower BP to the lowest borderline. In G-AH group, younger age was also predicting factor of increased risk of FDGD symptoms development. Research analysis regarding premature newborn birth lead us to think that maximum risk is seen in PE (0.25+-0.09) and Ch-AH+PE (0.07+-0.05) group. So, the highest period of premature birth was seen at 34-35th week of pregnancy. G-AH did not statistical reliably increased premature birth rate. In Ch-AH group risk increased significantly with severity grade. There was no risk of premature birth in borderline AH group. In Ch-AH group 2 peak of premature birth rate was seen: at 34-35th and 37-38th week of gestation. Next factors influence on instant risk of premature birth: AH severity, metoprolol and niphedipine intake at I trimester of pregnancy, left ventricle myocardial mass, left ventricle myocardial mass index, proteinuria, serum creatinine elevation, glomerular filtration slowing to 90ml/min in III trimester. Increased diastolic BP was risk predictor in Ch-Ah group, whereas older age (42.5+-2.2) was characteristic to G-AH group. Highest risk of low body mass newborns at gestational term was in women in PE (0.21+-0.08) and Ch-AH (0.04+-0.04). This risk was not statistically higher compared in any group, only in 2nd grade severity of Ch-AH group increased those in other groups. Instant risk factors for this complication were: AH severity, LVMMIndex, endothelium vasodilation index. Some research on using anti-hypertensive drugs on mild forms of AH in pregnant showed positive corellation between lowering mean BP and low body mass newborn birth rate. it happened despite form of AH, BP lowering drug type and duration of therapy. As it was expected, significant risk of early parturition rate was in group of PE (0.25+-0.09) and Ch-AH (0.07+-0.05). In comparison with borderline AH G-AH had reliable increase of early parturition risk, but Ch-AH 1st stage had no significant statistic difference. As with FDGD, instant risk factors where similar (AH severity, age, metoprolol daily dose, endothelial dysfunction and nephropathy during III trimester, P=44.68, p<0.001), thus increasing postpartum bleeding due to fetoplacentar failure because of AH, last factor may be considered independently as cardiovascular disease predictor.

CONCLUSION

Research data points to difference of gestation and perinatal complication risks depending on AH clinical type.

Complication rate and risks depend on elder age of pregnant women with Ch-AH, contrary older age in women with G-AH. In both clinical types having organ damage (heart, vessels, kidneys) and duration of AH were equally affected severity of complications. Excessive drop in BP may be beneficial for mother,

brings to perinatal complications due to decline in fetus-placenta circulation, especially at or after 22nd week of gestation.

Definitely forecast worsens when pre-eclampsia joins AH, and last may be avoided if medical treatment initiated at right time. Any drug therapy at I trimester of pregnancy reliably increases risk of complications. Short acting drugs like niphedipine or metoprolol does not improve long term outcome and does not lower pre-eclampsia risk in III trimester. Metoprolol intake at 50 mg dose or higher, increases postpartum bleeding risk, even in borderline normal AH group. Contrary to this, using long acting calcium channel blockers as amlodipine at 5-10 mg/daily after 22nd week of gestation reliably decreases complications regarding pregnancy, i.e. nephropathy and pre-eclampsia rate.

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