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CLINICAL STUDY

Previous pregnancy history, parity, maternal age and risk of pregnancy induced hypertension

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Abstract: Objective: The influence of antepartal, intrapartal and early neonatal risk factors, are very important during the pregnancy and the pregnancy outcome, also for the early neonatal period and the forthcoming children development. Our aim is to detect the risks groups of pregnant women that later develop Pregnancy Induced Hypertension (PIH) and risk factors that precede its appearance.
Patients and methods: We examined 67 preeclamptic and 129 normotensive pregnancies. In research are included only single pregnancies and the following parameters: maternal age, parity and previous pregnancy history.
Results: Average age is 25.73±5.77 years. After all, the largest number of primipara with preeclampsia is in category from ? 20 years ($p<0.01$). Considering the multipara we noticed that preeclampsia is most commonly developed in age between 31-35 years ($p<0.01$). Biggest number of pregnancies in normotensive group had previous normal pregnancies (59.15 %), while in hypertensive group only 30.77 % patients had normal pregnancies ($p<0.05$) .
Conclusions: PIH is most frequently appearing in young primiparas and adult multiparas. Pregnancies with PIH, really often there were negative ending of previous pregnancies *(Tab. 5, Ref. 20)*. Full Text in free PDF *www.bmj.sk*.
Key words: parity, maternal age, pregnancy history, pregnancy induced hypertension.

The influence of antepartal, intrapartal and early neonatal risk factors, is very important during the pregnancy and the pregnancy outcome, also for the early neonatal period and the forthcoming children development.

Worldwide, pre-eclampsia and eclampsia contribute to the death of a pregnant woman every 3 min. the management of pregnancies complicated by hypertension has not significantly altered for many years, possibly as results of little progress being made in our understanding of the condition (1).

Pre-eclampsia is a multisystem disorder, of unknown aetiology, usually associated with raised blood pressure and proteinuria (2). There are many terminologies used for this maternal disease, which appears after 20 weeks gestation and spontaneous resolution after delivery and is defined with exceeding blood pressure (BP) over 140/90 mmHg, proteinuria over 0.5 g/l per Esbach and edemas which persist during the treatment and after standing up (3, 4).

Risk factors for pre-eclampsia include socio- demographical factors (extremes of reproductive age, socio- economic status, ethnic group), genetic factors, pregnancy factors (multiple pregnancies, primigravidae, previous pre-eclampsia) or personal medical history (obesity, chronic renal disease, chronic hypertension, diabetes mellitus, trombophilia) (5).

Characteristic for PIH is bimodal frequency, i.e. identified mostly at young primipara (younger then 20 years) and older multipara (over 35 years) (3-5), even though there are authors that in their research haven't found connection between PIH from one side and parity and age from the other side (6).

PIH has been hypothesized to have an immune-based aetiology, whereby prolonged exposure to paternal sperm through sexual intercourse or fetal antigens through a previous pregnancy may be protective. In support of this hypothesis, studies have found that reproductive practices that minimize exposure to sperm are associated with an increased risk of PIH. These practices include use of barrier contraception, nonparent donor insemination and short duration of sexual cohabitation with the father before conception. Moreover an accumulating and consistent collection of studies suggests that the protective effect of previous birth is lost when the subsequent pregnancy conceived with a new partner (7).

But, spontaneous abortions may to a larger extent than induced abortions be associated with other factors, such as infertility, that may increase the risk of preeclampsia (8). Recurrent miscarriage and PIH perhaps share elements of the same aetiological factors (9).

Highest number of pregnancies with PIH, especially heavy form didn't have adequate antenatal protection. Active protection is very important factor in prevention of preeclampsia.

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PIH prevention doesn't require any special or expensive equipment. It's necessary to treat every pregnancy as potential PIH at the beginning, attention should be paid to the high risk groups especially.

The main reason for implementing this research is based on the conclusion that PIH does not appear as rear in our obstetric population. Consequently it becomes the basic idea of our research is identification and detection of risk groups of pregnant for PIH.

Methods

The research was conducted in the medical centre "Borka Taleski" in Prilep, during a 2 year period based on patients between age 15 and 41 years (average age 25.73±5.77 years).

The patients were divided in two groups:
1) First group based on 67 pregnancies induced hypertensive patients, as research group A.
2) Second group based on 129 normotensive pregnancies, as research group B.

The research was conditioned with the following criteria:
1) Exact information on the pregnancy stage. The criteria to determine the exact pregnancy stage is based on the following reliable criteria: anamnestical, obstetrical and ultrasound scan, which means that the information of the last period is corresponding with the results from the obstetrical examination and the ultrasound scan.
2) All patients started the pregnancy with normal blood pressure, i.e. on their first visit they didn't have artery pressure above 120/80 mmHg, and anamnestically we got information that they never had increased artery pressure.
3) All patients were healthy before i.e. they didn't have any chronic disease.
4) In research are included only single pregnancies and the following parameters: maternal age, parity and previous pregnancy history.

During the statistical analyzes, beside the descriptive method, a statistical parameter test was used nonparametric 2 test and logistic regression (OR – odds ratio).

Results

The research is based on 196 pregnancies with average age of 25.73+5.77 years (Tab. 1). Average age of 67 pregnancies (group A) where PIH was developed was 26 years, with diapason from 15 to 41 year, which statistically wasn't different compared with the group of 129 healthy pregnancies (group B), which average age was 25 years, with diapason from 17 to 40 years (p>0.05).

Regarding the parity, the pregnancies in both groups were divided in groups of primiparas, secundiparas, tertiparas and multiparas (with 3 and more previous pregnancies). With statistical analyses was concluded difference between groups (p > 0.05). Logistic regression analysis revealed: for primipara p= 0.38, OR (odds ratio) = 0.61 and for multipara p=0.29, OR=0.40. Parity is displayed in Table 2.

Tab. 1. Pregnancies average age.

Age	Group A		Group B	
	n	%	n	%
<20	20	29.85	22	17.05
21–25	18	26,87	42	32.56
26–30	10	14.93	38	29.46
31–35	14	20.89	21	16.28
>36	5	7.46	6	4.65
Total	67	100	129	100

Tab. 2. Pregnancy parity.

Parity	Group A		Group B	
	n	%	n	%
Primipara	41	61.2	66	51.16
Secundipara	17	25.37	53	41.08
Tertipara	6	8.95	7	5.43
Multipara	3	3.48	3	2.33
Total	67	100	129	100

Tab. 3. Primipara average age.

Age	Group A		Group B	
	n	%	n	%
< 20	20	48.78	10	15.15
21–25	16	39.02	27	40.91
26–30	4	9.76	12	18.18
31–35	1	2.44	11	16.67
> 36	0	0.00	6	9.09
Total	41	100	66	100

Tables 3 and 4 with descriptive statistical analyses are showing the patients age regarding the parity.

Biggest number of primiparas is in the category of pregnancies from 20 and below 20 years (48.78 %), which is statistically significant difference from the group of normotensive pregnancies (p<0.01).

By analyzing the age of multiparas can be concluded that PIH is developed more often in multiparas between ages of 31 to 35 years (p<0.01).

Previous pregnancy status at the patients where applicable are displayed in Table 5.

Biggest number of pregnancies in group B had previous normal pregnancies (59.15 %), while in group A only 30.77 % patients had normal pregnancies. For group A most characteristic are previous miscarriage (23.08 %), previous IUGR (15.38 %),

Tab. 4. Multiparas average age.

Age	Group A		Group B	
	n	%	n	%
< 20	0	0.00	12	19.05
21–25	2	7.69	15	23.81
26–30	6	23.08	26	41.27
31–35	13	50.00	10	15.87
> 36	5	19.23	0	0.00
Total	26	100	129	100

Tab. 5. Previous pregnancy status.

Previous pregnancy status	Group A		Group B	
	n	%	n	%
Normal Pregnancy	12	30.77	42	59.15
Ab.artefitialis	1	2.56	7	9.86
ab.spontaneus	9	23.08	8	11.27
IUGR	6	15.38	6	8.45
Previous Fetal death	2	5.13	2	2.82
Previous neon.death	3	7.70	2	2.82
Previous sterility	6	15.38	3	4.22
Total	39	100	71	100

earlier sterility (15.38 %), earlier neonatal death (7.7 %) and earlier fetal death (5.13 %). With nonparametric statistical analyses of the above mentioned parameters is concluded that there is statistically significant difference ($p<0.05$). Regarding previous pregnancy status, with logistic regression analysis we found: for normal pregnancy $p=0.22$; $OR=0.28$ and for abnormal previous pregnancy $p=0.48$; $OR=0.92$.

Discussion

Preeclampsia is a major cause of maternal and neonatal morbidity and mortality worldwide. Although the aetiology of preeclampsia is still unclear. Some studies that is major phenotypes, hypertension and proteinuria, may be due to an excess of circulating anti-angiogenic growth factors, most notably soluble fms-like tyrosine kinase 1 (sFlt1) and soluble endoglin (sEng) (10, 11).

Generally, to identify particular potential factors in cases of gestosis in some population requires lot of effort. That some factors have proven cause connection for PIH at most of the cases we couldn't prove any connection (12, 14).

Regarding the age and parity, PIH based on world literature sources, is more often developed at young primiparas and older multiparas actually it a has bimodal probability (3, 13, 15-17). In our study which includes 129 normotenzive and 67 pregnancies which developed PIH during the pregnancies, it is also registered bimodal probability, i.e. in our research too; hypertensive syndrome in pregnancy most commonly is developed in young primiparas and older multiparas.

We found that in the group of pregnancies with PIH, really often there were negative ending of previous pregnancies. In this group, mostly in obstetrical anamnesis, there were records about previous miscarriage (23.08 %), previous sterility/infertility was existing in 15.38 % and IUGR in earlier pregnancies was in 15.38 %. In smaller percentages are dominating records about earlier neonatal death (7.7%) and earlier fetal death (5.13 %). These records are suggesting that when we are talking about PIH, most likely there are problems with multifactor nature, which would require future research with detailed statistical calculation of all risk factors.

Women with a previous pregnancy complicated by preeclampsia have increased risk for recurrence in subsequent pregnancies. For severe preeclamptic women in an initial pregnancy, recurrence rates for any type of preeclampsia are very high, approaching 50 % in some studies (8, 9, 16, 17).

Conclusions

Preeclampsia affects 3-5 % of pregnancies and can have a significant impact on helth for both mother and fetus. Risk factors include maternal co-morbidities such as obesity and chronic hypertension, paternal factors, and genetic factors. New hypertension and proteinuria during the second half of pregnancy are key diagnostic criteria, but the clinical features and associated prognostic implication are somewhat heterogeneous and may reflect different mechanisms of disease (15).

Based on our research it can be concluded that PIH is most frequently appearing in young primiparas and adult multiparas. Pregnancies with PIH, really often there were negative ending of previous pregnancies

To reduce the level of perinatal morbidity and mortality in PIH, its necessary to insist on regular and organized control for every pregnancy, because its proven that with better antenatal protection, we can influence on perinatal morbidity and mortality. The delivery of the hypertensive pregnancies needs to be performed in institution that can provide intensive care and adequate therapy for the newborn if needed.

For women who have experienced a pregnancy complicated by preeclampsia, a systemic evaluation for underlying risk factors may identify a specific pathway sutable for a specific intervention. Although some progress has been made developing potentional options to prevent preeclampsia recurrence, there is a great need for better data to determine who will benefit most from any specific therapy (16, 17).

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