Noninvasive respiratory support in the complex of intensive care (IC) management of severe early-onset preeclampsia (PE)

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Background and Goal of Study

Obstructive sleep apnea syndrome (OSA) and small airway obstruction (SAO) are considered to be potential pathogenic ways of PE development since both lead to hypoxia and oxidative stress. At the same time PE itself can provoke early SAO manifestations and aggravate the course of OSA. The aim of this study was to investigate pathogenic justification and efficacy of CPAP as a part of IC of pregnant women with severe early-onset PE.

Materials and Methods

The study was approved by the local ethics commission. All women signed written informed consent to the study. We conducted a monocentre prospective controlled study. All pregnant women with clinically defined severe early PE were divided into two groups: with OSA and without which was confirmed by somnography. Then patients were randomized to receive CPAP in addition to classic therapy, and classic therapy without CPAP.

Thus were formed four groups:

- 1: the presence of OSA with CPAP (N=4);
- 2: the presence of OSA without CPAP (N=3);
- 3: non OSA with CPAP (N=11);
- 4: non OSA without CPAP (N=12).

Settings CPAP: PEEP from 7 to 12 mm H₂O, warmed humidified atmospheric air (FiO₂ 21%); every night from 10:00 p.m to 6:00 a.m.

Blood pressure (BP), PaO₂, PvO₂, arteriovenous oxygen difference (a-vO₂ diff), lactate, cerebral oxygenation (SrO₂), outcomes such as gestation age, time of prolongation of pregnancy, neonatal outcomes were evaluated.

The study was statistically validated using system "STATISTICA 10".

Results and Discussion

In groups with CPAP (1 and 3) there was an increase PaO₂, PvO₂, SrO₂ and a decrease in a-vO₂ diff and lactate at 6:00 a.m. in comparison with their level at 10:00 p.m.

In the group 4 initial value at 10:00 p.m. did not differ significantly from parameters in groups 1 and 3, but by 6:00 a.m. the dynamics of indicators have been identified. In group 4 there was an decrease PaO₂, PvO₂, SrO₂ and a inrease in a-vO₂ diff and lactate at 6:00 a.m. in comparison with their level at 10:00 p.m.

The time from hospitalization to delivery in groups 1, 2, 3, 4 were 8, 2, 10, 6 days respectively. The average weight of newborns in all groups was not statistically different.

Daily blood pressure variability

Antihypertensive therapy

- The effectiveness of BP control was the same in all groups.
- The use of additional CPAP resulted in reduce of antihypertensive therapy.

Neonatal outcomes	CPAP +	CPAP -
Mean birth weight (g):	1245,4±9,95	1304±9,12
Apgar score 5':		
≥ 7:	87 %	72 %
4-6:	13 %	28 %
≤ 3:	0 %	0 %
ILV	0 %	27 %

Conclusions

CPAP may become a new effective additional method in the intensive care of severe early onset preeclampsia. It is planned to further study.

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