

# Cerebral hemodynamics in fetuses with congenital heart disease: the first Russian study.

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## Objectives

To conduct a comparative analysis of head circumference, Dopplers of the middle cerebral artery (MCA) and cerebroplacental ratio (CPR), and to assess the relationship between fetal biometry and Doppler in groups with fetal congenital heart disease (CHD) and healthy fetuses.

## Methods

A retrospective case-control study included **189 patients with diagnosed fetal CHD** and **708 patients with healthy fetuses** (control group), who were examined at 22-40 weeks of gestation.

Cerebral parameters studied included fetal head circumference (HC), pulsation index (PI) and peak systolic velocity (PSV) in MCA and CPR.

## Results

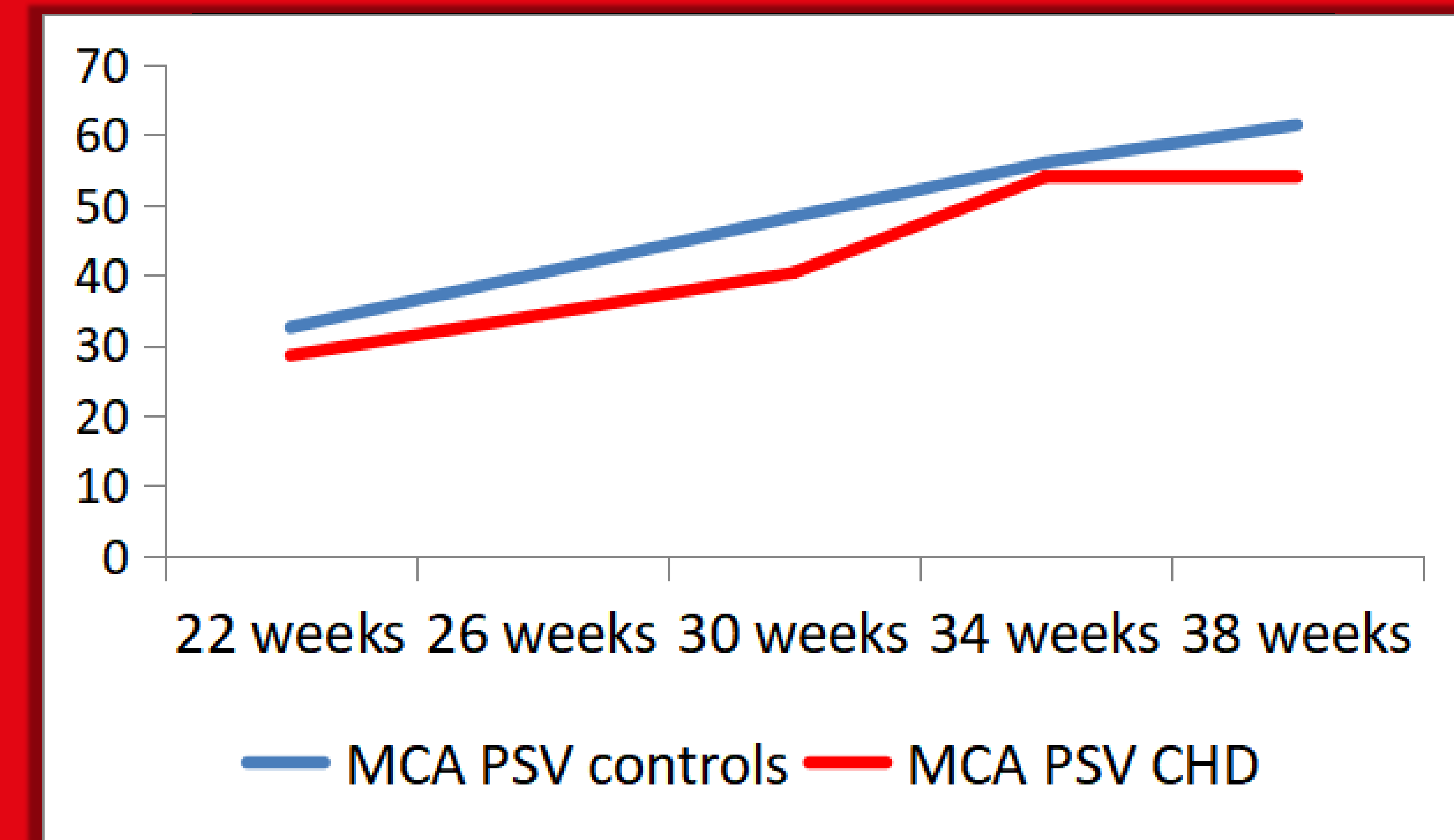
In the group of fetuses with CHD, compared with healthy fetuses, **lower median values** of percentile of

- **HC (55.3 vs. 62.8),**
- **MCA PI (41.5 vs. 48.2)**
- **CPR (28.3 vs. 41.3)** ( $p<0.01$ ) were noted.

The percentage of cases with HC<10th percentile, MCA PI and CPR <5<sup>th</sup> percentile was significantly higher in fetuses with CHD than in the control group, amounting to **9.0% vs. 3.8%, 10.6% vs. 2.1%, 19.6% vs. 5.4%**, respectively ( $p<0.01$ ).

**MCA PSV (cm/sec) values in the were significantly lower in fetuses with CHD at all gestational periods studied ( $p<0.05$ ).**

In both study groups, of all studied Doppler parameters, only for CPR, a direct relationship was found with the values of the fetal head circumference ( $p<0.01$ ).



## Conclusion

Fetuses with CHD are at increased risk of cerebral blood flow redistribution and retardation of head growth.

It is necessary to performed dynamic antenatal control of these parameters from the moment of detection of fetal cardiac pathology to delivery, aimed at the earliest possible detection of Doppler signs of perinatal hypoxia and appropriate correction of obstetric management.