

Fetal cardiovascular response towards Mozart's music

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Objective

The aim of our study was to identify the impact of Mozart's music on the resistance in fetal ductus venosus, umbilical artery, and middle cerebral artery. We have also evaluated the effect on the resistance in the maternal uterine arteries.

Methods

The current experimental study was conducted from May to September 2021 on the territory of the Second SAGBAL "Shaynovo" EAD, Sofia, Bulgaria. An ethics committee approved it. Informed consent was signed by all participants. This is a pilot study. Participants: The study population consisted of 60 healthy pregnant women aged 19 to 45 years in the first, second, and third trimesters of pregnancy. Methodology: The pulsating index in the middle cerebral artery, ductus venosus, umbilical artery of the fetus, and mother's uterine arteries were measured according to the FMF criteria (Fetal medicine foundation) in a state of complete physical and mental rest in the mother, in a quiet office in the supine position with the help of ultrasound machine GE Voluson V730. The basal values were measured after a 5-minute period of complete relaxation. In a state of rest, the participants listened to classical music (Mozart Concerto No. 3) with a volume at their request for 7 minutes. Re-measurement was performed when listening to music. The results were statistically analyzed using the Wilcoxon test. $P \leq 0.05$ values were considered statistically significant.

Results

The pulsating index was measured in the middle cerebral artery, ductus venus, and umbilical artery of the fetus, as well as bilaterally in the uterine vessels of the mother. The data were subjected to statistical analysis through the Wilcoxon test after prior removal of the extreme values. Our data show a statistically significant change and increase in resistance in the ductus venus by $p=0.023$ after a Wilcoxon test. Close to a statistically significant change were the indicators measured in the middle cerebral artery ($p=0.058$) and the mean between the left and right uterine artery ($p=0.053$) after a Wilcoxon test. Without statistically significant change remained the pulsatility index in the umbilical artery.

Conclusion

The observed cardiovascular changes in the fetus during musical stimulation in our study can be explained both by the influence of vascular substances passing through the placenta from the mother as well as by an increase in fetal movements. We can't rule out a direct effect on music. The result is difficult to determine as negative or positive. There is a need for additional research and data, both with classical music and with different styles of music.