

**Case Report**

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# Unusual Middle Cerebral Artery Values in Uneventful Term Pregnancies

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## Introduction

The fetal middle cerebral arterial Doppler assessment is an important part in the assessment of different conditions, i.e., fetal cardiovascular distress, intrauterine growth restriction (IUGR), twin to twin transfusion syndrome (TTTS) and twin anemia polycythemia sequence (TAPS) [1,2].

The first step suggested for a correct middle cerebral arterial (MCA) vessels individualization is to make run the color or power Doppler ultrasound overlying the anterior wing of the sphenoid bone near the base of the skull. Doppler velocimetry parameters usually used include mostly the fetal MCA pulsatility.

The mean value (normal reference range) slowly decreases through gestation from around 28 weeks onwards. It is stated that a low PI reflects redistribution of cardiac output to the brain due to the fetal head sparing theory.

This report regards uneventful term pregnancies with an abnormal low MCAPI. These cases, even if not frequent, may represent a clinical management challenge for the physician. We would like to underline that from 36 to 38 weeks gestation, MCAPI values range approximately between 1.7 and 1.6 [3,4]. We shortly describe three recent of the above-mentioned pregnancies.

### Case 1

A 32 years old nulliparous pregnant woman who underwent a routine Doppler velocimetry evaluation at 38 +1 wks'gestation. Blood pressure values always under control and no other

complications described. At Doppler evaluation, MCAPI was 1.27 (mean value of three taken with the fetus in quiescence and with no uterine contractions present). The MCAPI was repeated the day after (1.32) and a week after (1.21). The umbilical artery PI (UAPI) value evaluated in the same session, led always to an UA/MCAratio under the 50th centile for the corresponding gestational age. The neonate was delivered uneventful at 39+3 weeks gestation, weighing 3280 gr.

### Case 2

A 28 year old at 39 wks'gestation nulliparous pregnant woman arrived at the emergency room with the diagnosis of abdominal pain due to gallstones in the gallbladder. Blood pressure values were always under control. At Doppler evaluation, MCAPI was 1.28, and the day after it was 1.31. UA PI always led to UA/MCA ratios values between the 25th and 50th centile. Due to the persistent abdominal pain a cesarean section was performed, the neonate was clinically uneventful and weighed 3450 gr at birth.

### Case 3

A 25-year-old at 38+2 weeks, second gestation pregnant woman, regularly evaluated in our Department, with no complications in pregnancy, arrived for a scheduled cardiotocographic trace. A Doppler evaluation was performed within an evaluation for the suspect of decreased amniotic fluid after a cardiotocographic trace. MCA PI ranged between 1.22 and 1.29 three times in the same day. As for the other cases described, UA PI evaluated always led to UA/

MCA ratios values under the 50th centile. The pregnant woman did not return for continued evaluation as suggested by our staff and delivered at 40 weeks- gestation a 3645-gr baby, uneventful for any neonatal complication.

If we analyse the uneventful term pregnancies presented, the unusual low MCAPPI values at term, may, if completed with UAPI and UA/MCA ratios, reflect the actual fetal hemodynamic status [3]. According Arduini et al, the assessment of UA/MCA PI index provides better information in predicting perinatal outcome when compared with umbilical or middle cerebral artery Doppler indices alone [5]. We observed the same pattern in the prediction of perinatal outcome in a research study performed in IUGR fetuses [6].

In an interesting recent study maternal characteristics and medical history were recorded and fetal MCA-PI and UA-PI were measured in women with singleton pregnancies at 30+0 to 37+6 weeks 'gestation. They have established that during the third-trimester of pregnancy, MCA-PI decreases with gestational age, is lower in women of East Asian racial origin and it is higher in parous than in nulliparous women and increases with birth-weight Z-score of the neonate in the previous pregnancy [7].

The cases presented are a part of a prospective research and underline the reassuring utility of the UA/MCA ratios whenever an abnormal low MCAPPI value is present in an apparently uneventful term pregnancy.

## Acknowledgement

None.

## Conflict of Interest

Authors declare no conflict of interest.

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