

UOG Journal Club: July 2015

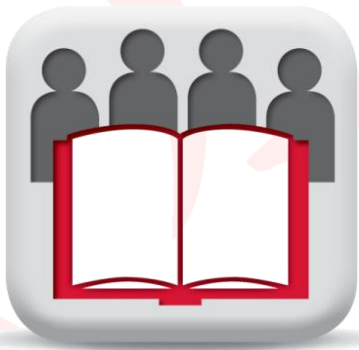
妇产科超声杂志期刊俱乐部：2015年7月

Umbilical and fetal middle cerebral artery Doppler at 35–37 weeks' gestation in the prediction of adverse perinatal Outcome

妊娠35-37周脐动脉和胎儿中脑动脉多普勒对不良围产期结局的预测

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Ultrasound Obstet Gynecol 2015; **46**: 82–92



Journal Club slides prepared by Dr Aly Youssef
(UOG Editor for Trainees)

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Introduction前言

- Doppler assessment of the umbilical artery (UA), middle cerebral artery (MCA) and the ratio of the pulsatility index (PI) in these vessels (cerebroplacental ratio; CPR) are used for assessment of fetal oxygenation
- 脐动脉 (UA)、大脑中动脉(MCA)的超声多普勒评估和这些血管的搏动指数(PI)的比值 (脑胎盘比;CPR)用于评估胎儿供氧。
- Whereas most studies on the clinical use of CPR have focused on assessment of small-for-gestational-age (SGA) fetuses, there is growing evidence that the majority of cases of adverse perinatal outcome occur in appropriate-for-gestational-age (AGA) babies
- 而大多数CPR的临床应用研究主要集中在评估小于胎龄儿(SGA),越来越多的证据表明,大多数情况下的不良围产结局发生在适龄儿(AGA)。
- It could be argued that prenatal care should focus on identifying hypoxemic rather than small fetuses, and, consequently, screening should focus on the detection of pregnancies with low CPR rather than just those with low estimated fetal weight
- 值得争议的是, 产前检查应该关注于识别胎儿血氧过低,而不是体重小的胎儿,因此,筛选应该集中在发现低CPR的妊娠,而不仅仅是那些胎儿体重预测值低的妊娠。

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Aim of the study 研究目的

**To investigate the potential value of CPR
at 36 weeks' gestation in the prediction of
adverse perinatal outcome**

探讨妊娠36周CPR对不良围产结局预测的潜在价值

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Methods研究方法

- Data derived from prospective screening for adverse obstetric outcomes in women attending for their routine visit at 35+0 to 37+6 weeks' gestation
- 对筛查存在潜在不良产科结局的妊娠妇女，在其妊娠35周至37+6周时产检时收集数据
- Data recorded included maternal characteristics, medical history, estimation of fetal size and assessment of fetal UA-PI and MCA-PI
- 数据记录包括孕产妇特点、病史、估计胎儿大小和评估胎儿UA-PI和MCA-PI
- Outcome measures were stillbirth, Cesarean section for fetal distress, UA cord blood pH ≤ 7.0 , UV cord blood pH ≤ 7.1 , 5-min Apgar < 7 , admission to neonatal unit (NNU) or intensive care unit (NICU)
- 结果测量是死产、胎儿窘迫行剖宫产的、脐动脉血pH值 ≤ 7.0 、脐静脉血pH值 ≤ 7.1 、5分钟Apgar 评分 < 7 、进入新生儿科(NNU)或新生儿重症监护室(NICU)
- The newborn was considered to be SGA if the birth weight was < 10 th percentile after correcting for gestational age at delivery
- 经纠正核实孕龄后出生体重小于第10百分位的新生儿被考虑为SGA

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Methods

研究方法

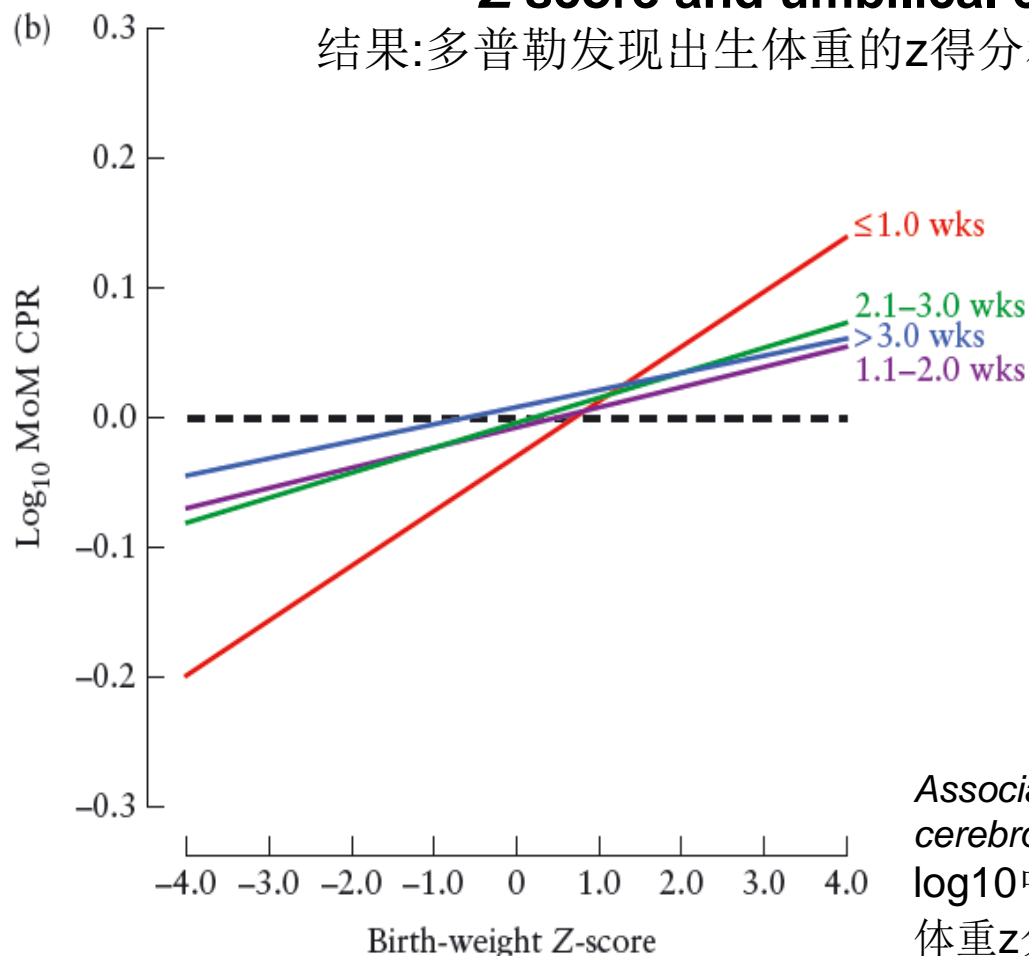
- MCA-PI and UA-PI values were expressed as multiples of the median (MoM) after adjustment for maternal characteristics and medical history that affect these measurements
 - 经调整孕产妇特点和病史这些可能影响测量的因素，MCA-PI和UA-PI值以中间值的倍数(MoM)表示
 - The CPR was calculated by dividing MCA-PI MoM by UA-PI MoM
 - CPR用MCA-PI MoM除以 UA-PI MoM来计算
-
- Univariable and multivariable logistic regression analyses were used to determine if \log_{10} CPR MoM had a significant additional contribution to maternal characteristics, medical history and obstetric factors in predicting adverse outcome
 - 单变量和多变量逻辑回归分析是用来确定 \log_{10} CPR MoM对母性特征、病史和产科因素在预测不良结局中是否存在一个额外重要的贡献

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Results: relationship of Doppler finding with birth-weight Z-score and umbilical cord blood pH

结果:多普勒发现出生体重的z得分和脐带血液pH值的关系



There was a significant association between log₁₀ MoM CPR and birth-weight Z-score, UA and UV cord blood pH

出生体重z得分、脐动脉和脐静脉血的pH值有显著联系

The steepness of the regression lines was inversely related to the assessment-to-delivery interval

回归线的倾斜度与分娩评估区间呈负相关

Association between log₁₀ multiples of the median (MoM) cerebroplacental ratio (CPR) and birth-weight Z-score

log₁₀中位数的倍数 (MoM) 脑胎盘比(CPR)和出生体重z分数之间的关系

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Results: prediction of stillbirth

结果：死产的预测

- Among the 6038 pregnancies included in the study, there were four stillbirths (one intrapartum) at 2.4–5.9 weeks after assessment
- 在这项包含6038个妊娠的研究中，预测2.4-5.9周后，有四个死胎(其中一个在分娩时)
- The birth-weight percentile was 3%, 0.9% and 25% for the antepartum stillbirths and > 99% for the intrapartum stillbirth
- 产前死胎的出生体重的百分比是3%,0.9%和25%，产时死胎百分比>99%
- **CPR was > 5th percentile in all four pregnancies with a stillbirth**
- 四个死胎的妊娠中，CPR大于第五百分位

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Results: prediction of fetal distress during labor leading to Cesarean section

结果:分娩过程中胎儿窘迫导致剖宫产的预测

- Multivariable regression analysis demonstrated that **log₁₀ CPR MoM did not contribute to the predict** (DR and FPR of 6.3% and 5.7%, respectively)
- 多变量回归分析表明,log₁₀ CPR MoM并不能用于预测(DR和FPR分别为6.3%和5.7%)
- The positive predictive value (PPV) of a low CPR was:
- 低CPR的阳性预测值(PPV):
 - 9.5% (27/283) for all adverse events
 - 对所有不良事件为9.5%(27/283)
 - 13.3% (8/60) for those delivering ≤ 2 weeks from assessment
 - 对于那些评估后≤ 2周分娩的为13.3%(8/60)
 - 8.5% (19/223) for those who delivered > 2 weeks after assessment
 - 对于那些评估后> 2周分娩的为 8.5%(19/223)

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Results: prediction of low cord blood pH

结果:低脐带血pH值的预测

- Multivariable regression analysis demonstrated that log₁₀ CPR MoM did not contribute to the prediction of **umbilical arterial cord blood pH ≤ 7.0** (DR and FPR of 8.3% and 6.3%, respectively)
- 多变量回归分析表明, log₁₀ CPR MOM不能用于脐动脉血pH值≤7.0的预测(DR和FPR分别为8.3%和6.3%)
- The PPV of low CPR for the adverse event was:
- 不良事件低CPR的PPV:
 - 3.4% (4/117) for all cases
 - 所有病例的3.4%(4/117)
 - 6.1% (2/33) for those delivering ≤ 2 weeks and
 - 对于那些≤ 2周分娩的为13.3%(8/60)
 - 2.4% (2/84) for those delivering > 2 weeks
 - 对于那些大于2周分娩的为2.4% (2/84)

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Results: prediction of low Apgar score

结果:低阿普加评分的预测

- Multivariable regression analysis demonstrated that log₁₀ CPR MoM did not contribute to the prediction of **5-min Apgar score <7** (DR and FPR of 15.2% and 5.9%, respectively)
- 多变量回归分析表明, log₁₀ CPR MoM不能用于5分钟阿普加分数<7的预测(DR和FPR分别为15.2%和5.9%)
- The PPV of low CPR for the adverse event was:
- 不良事件低CPR的假阳性率:
 - 1.5% (5/325) for all cases
 - 所有病例的1.5%(5/325)
 - 2.5% (2/80) for those delivering ≤ 2 weeks
 - 对于那些≤2周分娩的为2.5%(2/80)
 - 1.2% (3/245) for deliveries > 2 weeks after assessment
 - 对于那些大于2周分娩的为1.2% (3/245)

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Results: prediction of admission to NNU

结果:新生儿进入NNU的预测

- Multivariable regression analysis demonstrated that log₁₀ MoM CPR did not contribute to the prediction of **admission to NNU** (DR and FPR of 7.7% and 6.1%, respectively)
- 多变量回归分析表明, log₁₀ MoM CPR并不能用于新生儿进入NNU的预测(DR和FPR分别为7.7%和6.1%)
- The PPV of low CPR for the adverse event was:
- 不良事件低CPR的PPV:
 - 5.9% (22/371) for all cases
 - 所有病例的5.9%(22/371)
 - 12.8% (12/94) for those delivering ≤ 2 weeks
 - 对于那些≤ 2周分娩的为12.8%(12/94)
 - 3.6% (10/277) for those delivering > 2 weeks after assessment
 - 对于那些大于2周分娩的为3.6% (10/277)

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Discussion讨论

- This study confirm that, although the incidence of adverse perinatal outcome is higher in SGA compared to AGA fetuses, half of stillbirths and the majority of cases for other adverse outcome are in the AGA group
- 本研究证实,与AGA胎儿相比, 尽管SGA胎儿的不良围产期结局的发病率更高,但是一半的死产和大多数情况下为其他不利结局的仍是AGA胎儿组
- The study demonstrates that at 35–37 weeks' gestation, the performance of low CPR in screening for adverse outcome is poor, with a DR of up to 15% for a FPR of about 6%.
- 研究表明,在妊娠35-37周,筛查低CPR不良结局的性能差, DR高达15%, FPR约6%。
- In the population delivering within 2 weeks of assessment, the DR improved up to 50%, but with a simultaneous increase in FPR to about 10%.
- 在评估2周内分娩的人群, DR提高到50%, 但同时FPR增加到约10%。

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Strengths 优点

- Examination of a large population of 3rd trimester women attending for routine assessment of fetal growth and wellbeing
- 人口众多的晚期妊娠妇女的检查都加入了胎儿生长和健康的例行评估
- Measurement of MCA-PI and UA-PI by appropriately-trained personnel
- 由训练有素的人员测量MCA-PI和UA-PI
- Use of a wide range of indicators for adverse perinatal outcome
- 对不良围产期结局的预测使用了各种不同的指标

Limitations 局限性

- Results of the scan were made available to the obstetricians – hence intervention bias on the basis of SGA (thereby reducing adverse outcome) cannot be excluded
- 扫描的结果对产科医生有用——因此干预偏倚基于SGA(从而减少不良结局)不能被排除在外
- It is unclear whether the adjustment of CPR MoM for multiple factors is physiologically appropriate or masking clinical effects
- 尚不清楚CPR MoM对多个因素的调节是适当的生理还是掩蔽的临床效果

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Discussion points 讨论要点

- What is the relative performance of SGA by EFW compared to CPR MoM in the prediction of adverse outcome?
- 与CPR MoM相比，估计胎儿体重为SGA对预测不良结局的相对性能是什么？
- Should middle cerebral artery and umbilical artery be performed routinely in the third trimester?
- 在妊娠晚期，应该常规检查大脑中动脉、脐动脉吗？
- Should fetal weight be routinely estimated in the late third trimester?
- 在晚孕后期应该常规估计胎儿体重吗？
- How should women at term with AGA fetuses and low CPR be managed?
- 应该如何和管理怀有AGA胎儿和低CPR的妊娠妇女？
- Should a low CPR change the management of women with SGA fetuses at term?
- 对怀有SGA胎儿的妊娠妇女，是否因为低CPR而改变其管理？