Excerpts from the World Medical Literature: Obstetrics

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Gilroy LC, Al-Kouatly HB, Minkoff HL, et al. Changes in obstetric practices and pregnancy outcomes following the ARRIVE trial. Am J Obstet Gynecol 2022;S0002-9378(22)00101-6.

Summary: The ARRIVE trial demonstrated the benefit of elective induction of labour at 39 weeks gestation. The authors of this study sought to determine whether there were changes in obstetric practices and perinatal outcomes in the United States after the trial was published. The authors conducted a population-based, retrospective cohort study involving low-risk, nulliparous women. The pre-ARRIVE group was comprised of women who delivered between January 1, 2015, and December 31, 2017, whereas the post-ARRIVE group included women who delivered between January 1 and December 31, 2019. Outcomes were rates of induction of labour; timing of delivery; rates of cesarean delivery; maternal blood transfusion and admission to medical intensive care units; and neonatal outcomes including the need for assisted-ventilation (immediate and >6 hours), 5-minute Apgar score <3, neonatal intensive care unit admission, seizures, and surfactant use.

There were 1 966 870 births in the pre-ARRIVE group and 609 322 in the post-ARRIVE group. The post-ARRIVE group was more likely to undergo induction (36.1% vs. 30.2%; adjusted odds ratio [aOR] 1.36; 95% confidence interval [CI] 1.36−1.37) and had a significantly lower rate of cesarean delivery than the pre-ARRIVE group (27.3% vs. 27.9%; aOR 0.94; 95% CI 0.93−0.94). The post-ARRIVE group was more likely to receive a blood transfusion (0.4% vs. 0.3%; aOR 1.43; 95% CI 1.36−1.50) and be admitted to medical intensive care units (0.09% vs. 0.08%; aOR 1.20; 95% CI 1.09−1.33). The post-ARRIVE group was more likely to need assisted ventilation at birth (3.5% vs. 2.8%; aOR 1.28; 95% CI 1.26−1.30) and at >6 hours (0.6% vs. 0.5%; aOR 1.36; 95% CI 1.31−1.41) and more likely to have low 5-minute Apgar scores (0.4% vs. 0.3%; aOR 0.91; 95% CI 0.86−0.95). In sum, in the year after the ARRIVE trial was published there were statistically significant increases in inductions of labor and deliveries at 39 weeks gestation and fewer cesarean deliveries. There were, however, small but statistically significant increases in some adverse maternal and neonatal outcomes that warrant further study.

Comment: I am obviously a fan of the randomized control trial (RCT), but sometimes real-world application of a trial can lead to surprising results. Of course, these results may be confounded but they should focus our surveillance to ensure that RCT evidence, when implemented, does not lead to unintended outcomes.

Fuxe V, Brismar Wendel S, Bohm-Starke N, et al. Delivery mode and severe maternal and neonatal morbidity among singleton term breech births: a population-based cohort study. Eur J Obstet Gynecol Reprod Biol 2022;272:166−72.

Summary: The aim of this nationwide population-based cohort study was to examine the association between delivery mode and severe maternal and neonatal morbidity in singleton term breech births. The study included 41 319 singleton term and post-term breech births (37^0−42^6 weeks gestation) in Sweden from 1998 to 2016. Data were retrieved from the Swedish Medical Birth Register.

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Primary outcomes were 2 separate composite outcomes: maternal and neonatal severe morbidity. Secondary outcomes were individual severe maternal and neonatal morbidity outcomes. Hospitalizations and outpatient visits during childhood were also analyzed for the ages 0 to 5 years.

There was no difference in maternal morbidity between vaginal and prelabour cesarean delivery. However, intrapartum cesarean delivery was associated with higher odds of maternal morbidity (aOR 1.27; 95% CI 1.10—1.47) when compared with prelabor cesarean delivery. Vaginal delivery was associated with higher odds of composite neonatal morbidity (aOR 1.85; 95% CI 1.54—2.21) as well as higher numbers of nights in hospital and outpatient visits during the infant's first year of life, compared with prelabour cesarean delivery. The authors concluded that prelabour cesarean delivery in breech births improved short-term neonatal health without increasing risks for severe short-term maternal complications.

Comment: In the same theme as the first article in this series, this is another population study looking at the implementation of the findings from a RCT—this time, the Term Breech Trial. I think it is important to reflect on the fact that, despite all the potential flaws identified in the Term Breech Trial and the resurgence of vaginal breech birth in some centres, this study has shown that planned vaginal birth may have adverse consequences. As expected, the study also shows that intrapartum cesarean delivery is riskier than cesarean performed prior to labour.

Fell DB, Dhinsa T, Alton GD, el al. Association of COVID-19 vaccination in pregnancy with adverse peripartum outcomes. JAMA 2022;327:1478—87.

Summary: There is limited comparative epidemiological evidence on outcomes associated with COVID-19 vaccination during pregnancy. This population-based, retrospective cohort study in Ontario, Canada, evaluated peripartum outcomes following COVID-19 vaccination during pregnancy. The study used birth registry data linked with the provincial COVID-19 immunization database and included all women who either received COVID-19 vaccination during pregnancy, received COVID-19 vaccination after pregnancy, or were not vaccinated. All births between December 14, 2020, and September 30, 2021, were included. Outcomes included postpartum hemorrhage, chorioamnionitis, cesarean delivery (overall and emergency), admission to a neonatal intensive care unit, and low 5-minute Apgar score (<7).

Among 97 590 patients, of whom 22 660 (23%) received at least 1 dose of COVID-19 vaccine during pregnancy, 63.6% received dose 1 in the third trimester. Almost all women who were vaccinated (99.8%) received an mRNA vaccine. There were no significantly increased risks of any adverse outcome between women vaccinated during pregnancy and those vaccinated after delivery (n = 44 815). Findings were similar when the authors compared women vaccinated during pregnancy with those who did not receive vaccination at any point (n = 30 115). The authors concluded that COVID-19 vaccination during pregnancy was not associated with increased risk of adverse peripartum outcomes.

Comment: With the pandemic still with us, this important and unique data coming out of Canada are vital as we strive to reduce the impact of COVID-19 infection during pregnancy. Of note, this study found that younger mothers were less likely to be vaccinated. The data on the impact of vaccination in pregnancy on adverse outcomes are reassuring, and we should use it to support our mission to be strong advocates of vaccination during pregnancy.

Beyuo T, Lawrence ER, Kobernik EK, et al. A novel 12-hour versus 24-hour magnesium sulfate regimen in the management of eclampsia and preeclampsia in Ghana (MOPEP Study): a randomised controlled trial. Int J Gynaecol Obstet 2022 Mar 19. doi: 10.1002/ijgo.14181. Epub ahead of print. PMID: 35304745.

Summary: This RCT compared the efficacy of a 12-hour versus 24-hour regimen of intramuscular magnesium sulfate for the management of eclampsia and preeclampsia. This was an open-label, parallel, RCT conducted in Accra, Ghana, from November 2018 to November 2020. Participants were pregnant women with a diagnosis of antepartum, intrapartum, or postpartum eclampsia or preeclampsia with severe features who had received no more than a loading dose of magnesium sulfate prior to admission. Participants in the standard 24-hour group received a loading dose of magnesium sulfate 4 g intravenous and 10 g intramuscular (5 g in each buttock) followed by six 5-g intramuscular maintenance doses over 24 hours. Participants in the 12-hour intervention group received the same loading dose followed by three 5-g intramuscular maintenance doses over 12 hours. The primary outcome was occurrence of seizure after completion of the assigned regimen.

Of the 1176 study participants, there was no significant difference in the occurrence of seizure between the 24-hour group and the 12-hour group (5 [0.9%] vs.

2 [0.3%] events, respectively; $P = 0.29$; realtive risk [RR] 0.40; 95% CI 0.08−2.04) or in occurrence of seizure any time after enrollment (9 [1.5%] vs. 5 [0.9%], respectively; $P = 0.28$; RR 0.55; 95% CI 0.19−1.64). Participants in the 12-hour group had shorter inpatient stays and shorter duration of urethral catheterization. Adverse effects from magnesium sulfate were lower in the 12-hour group. Overall, compared with 24 hours, 12 hours of intramuscular magnesium sulfate had similar rates of seizure, with fewer adverse effects and shorter hospital stays.

Comment: Although perhaps not found in one of the leading international journals, I think this is a very important RCT that does a good job of interrogating a practice that all who work in the labour and delivery unit question: *Can we safely stop the magnesium sulfate before 24 hours is up*? Magnesium sulfate is lifesaving, but the continuation of the infusion for 24 versus 12 hours postpartum, which is a common policy in many units, can have significant resource implications and is worth reconsidering.