Gadolinium Pregnancy Screening Statement

It has been shown that some gadolinium-based contrast agents (GBCAs) pass the placental barrier into the fetal circulation of nonhuman primates [1]. While multiple small sample size studies have not shown convincing evidence of adverse effects from fetal exposure to GBCAs [2,3], a 2016 retrospective study cited an increased risk of stillbirth/neonatal death as well as increased risk of rheumatologic, inflammatory, or infiltrative skin conditions in the offspring after GBCA exposure during pregnancy [4]. While, questions have been raised regarding study methodology, and these results have not been independently confirmed, both uncertainty and an abundance of caution in general about the effect of GBCA exposure and retention on the developing fetus has led to statements in the ACR Manual on Contrast Media [5] and the ACR Manual on MR Safety [6] recommending avoidance of routine administration of GBCAs to pregnant patients. A decision to administer GBCAs to a pregnant woman should only be made when there is the potential for significant clinical benefit that outweighs the unknown risk of fetal exposure and should be the product of discussion that involves the referring provider and patient.

A 2019 study cited increased prevalence of GBCA administration during the first trimester as opposed to later in pregnancy, indicating that many exposures have occurred without pregnancy screening and/or prior to recognition of pregnancy. This suggests a potential need for more vigilant pregnancy screening protocols [7]. The current standard of practice is to avoid routine GBCA administration during pregnancy due to the unknown risk of fetal exposure [5,6,8]; and we recommend that imaging facilities have an established standardized system of screening in place that includes screening for unsuspected pregnancy prior to GBCA administration within existing institutional protocols that similarly screen patients prior to exposure to ionizing radiation and/or anesthesia. Protocols regarding pregnancy testing and reporting of results for pediatric patients and patients with legal guardians must be in accordance with local and state regulatory statutes.

There is variability in the accuracy of pregnancy tests early in gestation, and at a minimum, testing will be falsely negative in the first two weeks of pregnancy. As such, there is no screening method that will be 100% effective in detection of unsuspected pregnancy. Regardless of which screening option is chosen, women of child-bearing age should be informed of the lack of certainty regarding risk of fetal GBCA exposure. An increased awareness of the issue by the patient may facilitate information sharing between patient and MRI staff regarding potential for pregnancy that would improve accuracy of screening. Any discussion with referring providers or patients acknowledging uncertain risks of GBCAs should always be coupled with an assessment of the known diagnostic benefits accrued from contrast-enhanced examinations on a per patient basis.

References

1. Oh KY, Roberts VH, Schabel MC, Grove KL, Woods M, Frias AE. Gadolinium Chelate Contrast Material in Pregnancy: Fetal Biodistribution in the Nonhuman Primate. Radiology 2015;276:110-8.
2. De Santis M, Straface G, Cavaliere AF, Carducci B, Caruso A. Gadolinium periconceptional exposure: pregnancy and neonatal outcome. Acta obstetricia et gynecologica Scandinavica 2007;86:99-101.
3. Spencer JA, Tomlinson AJ, Weston MJ, Lloyd SN. Early report: comparison of breath-hold MR excretory urography, Doppler ultrasound and isotope renography in evaluation of symptomatic hydronephrosis in pregnancy. Clinical radiology 2000;55:446-53.
4. Ray JG, Vermeulen MJ, Bharatha A, Montanera WJ, Park AL. Association Between MRI Exposure During Pregnancy and Fetal and Childhood Outcomes. Jama 2016;316:952-61.
5. American College of Radiology. ACR Manual on Contrast Media. Available at: https://www.acr.org/-/media/ACR/Files/Clinical-Resources/Contrast_Media.pdf. Accessed January 31, 2022.

6. American College of Radiology; ACR Committee on MR Safety. ACR Manual on MR Safety. Available at: https://www.acr.org/-/media/ACR/Files/Radiology-Safety/MR-Safety/Manual-on-MR-Safety.pdf. Accessed September 7, 2021.

7. Bird ST, Gelperin K, Sahin L, et al. First-Trimester Exposure to Gadolinium-based Contrast Agents: A Utilization Study of 4.6 Million U.S. Pregnancies. Radiology 2019;293:193-200.

8. Committee on Obstetric Practice. Committee Opinion No. 723: Guidelines for Diagnostic Imaging During Pregnancy and Lactation. Obstetrics and gynecology 2017;130:e210-e16.