ADMINISTRATION OF CONTRAST MEDIA TO PATIENTS WHO ARE BREAST-FEEDING

Imaging studies requiring either iodinated or gadolinium-based contrast media are occasionally required in patients who are breast feeding. Both the patient and the patient's physician may have concerns regarding potential toxicity to the infant from contrast media that is excreted into the breast milk.

The literature on the excretion into breast milk of iodinated and gadolinium-based contrast media and the gastrointestinal absorption of these agents from breast milk is very limited; however, several studies have shown that the expected dose of contrast medium absorbed by an infant from ingested breast milk is extremely low.

Iodinated X-ray Contrast Media (Ionic and Nonionic)
Background

The plasma half-life of intravenously administered iodinated contrast medium is approximately 2 hours, with nearly 100% of the media cleared from the bloodstream in patients with normal renal function within 24 hours. Because of its low lipid solubility, less than 1% of the administered maternal dose of iodinated contrast medium is excreted into the breast milk in the first 24 hours with one paper showing concentrations of iohexol (350 mg I/ml) of approximately 0.5% of weight-adjusted maternal dose in the first 24 hours after exposure [1,4,9]. In addition, less than 1% of the contrast medium ingested by the infant is absorbed from its gastrointestinal tract [2]. Therefore, the expected systemic dose absorbed by the infant from the breast milk is less than 0.01% of the intravascular dose given to the mother. This amount represents less than 1% of the recommended dose for an infant being prescribed iodinated contrast material intravenously related to an imaging study (usually 1.5 to 2 mL/kg). The potential risks to the infant from breast milk include allergic sensitization or reaction, which are theoretical concerns but have not been reported, and adverse effects on the infant's thyroid. The likelihood of either direct toxic or allergic-like manifestations resulting from ingested iodinated contrast material in the infant is extremely low. There is no high-quality literature on thyroid dysfunction in infants related to contrast media exposure through breast milk with a single case report inferring transient neonatal hypothyroidism induced by breast milk containing iodinated contrast media in a premature infant (despite withholding breast milk for 24 hours post exposure) [8]. As with other medications in milk, the taste of the milk may be altered if it contains contrast medium [1,2,4,9].

For further information on ACR recommendations / guidelines on thyroid testing after direct iodinated contrast exposure in infants please see the ACR Statement on Use of Iodinated Contrast Material for Medical Imaging in Young Children and Need for Thyroid Monitoring and the Contrast Media in Children *Chapter.*

Recommendation

Because of the very small percentage of iodinated contrast medium that is excreted into the breast milk and absorbed by the infant's gut, the available data suggest that it is safe for the mother and infant to continue breast-feeding after receiving such an agent. Ultimately, however, an informed decision to temporarily stop breast-feeding should be left up to the mother after these facts are communicated. If the mother remains concerned about any potential ill effects to the infant, she may abstain from breast-feeding from the time of contrast administration for a period of 12 to 24 hours. In this situation, the mother should be told to express and discard breast milk from both breasts during that period. In anticipation of this, she may wish to use a breast pump to obtain milk before the contrast-enhanced study to feed the infant during the 24-hour period following the examination. There is little value to stop breast-feeding beyond 24 hours.

While data remains limited, we do not recommend routine thyroid monitoring in infants (premature or term) after exposure to iodinated contrast material through ingested breast milk.

Gadolinium-Based Contrast Agents
Background

Like iodinated contrast media, gadolinium-based contrast media have a plasma half-life of approximately 2 hours and are nearly completely cleared from the bloodstream in patients with normal renal function within 24 hours. Also similar to iodinated contrast media, gadolinium-based contrast media are excreted into the breast milk. It is likely that the overwhelming bulk of gadolinium excreted in the breast milk is in a stable and chelated form [5].

Less than 0.04% of the intravascular dose given to the mother is excreted into the breast milk in the first 24 hours [3,5,6]. Because less than 1% of the contrast medium ingested by the infant is absorbed from its gastrointestinal tract [5,7], the expected systemic dose absorbed by the infant from the breast milk is less than 0.0004% of the intravascular dose given to the mother. This ingested amount is far less than the permissible dose for intravenous use in neonates. The likelihood of an adverse effect from such a minute fraction of gadolinium chelate absorbed from breast milk is remote [1]). However, the potential risks to the infant include direct toxicity (including toxicity from free gadolinium, because it is unknown how much, if any, of the gadolinium in breast milk is in the unchelated form) and allergic sensitization or reaction. These are theoretical concerns but none of these complications have been reported [6]. As in the case with iodinated contrast medium, the taste of the milk may be altered if it contains a gadolinium-based contrast medium [1].

Recommendation

Because of the very small percentage of gadolinium-based contrast medium that is excreted into the breast milk and absorbed by the infant's gut, the available data suggest that it is safe for the mother and infant to continue breast-feeding after receiving such an agent [5].

Ultimately, an informed decision to temporarily stop breast-feeding should be left up to the mother after these facts are communicated as survey data suggests that patient preference and radiologist's opinion may sometimes differ [10]. If the mother remains concerned about any potential ill effects to the infant, she may abstain from breast-feeding from the time of contrast administration for a period of 12 to 24 hours. In this situation, the mother should be told to express and discard breast milk from both breasts after contrast administration until breast feeding resumes. In anticipation of this, she may wish to use a breast pump to obtain milk before the contrast-enhanced study to feed the infant during the 24-hour period following the examination. There is little value to stop breast feeding beyond 24 hours, by which time the contrast media is nearly completely cleared from the mother's bloodstream.

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