Infant & Young Child Feeding n Nutrition in Perspective
透視嬰幼兒餵哺與營養
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Common Radiological Investigations and Breastfeeding: Frequently Asked Questions

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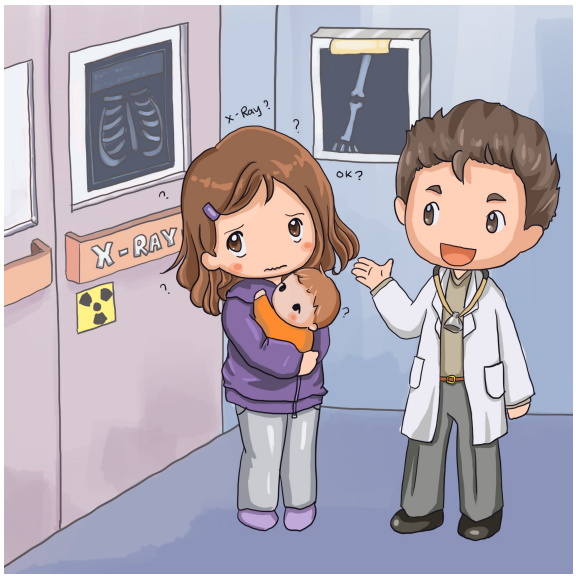

The use of radiological imaging and procedures has become increasingly common in recent years. With it comes the increased awareness of and concerns or misconceptions about the risks of ionising radiation and in particular, the potential risks to the breastfeeding mother and her child. Patients may worry about the risks to infants or children posed by the ingestion of contrast materials in breastmilk following contrast-enhanced imaging or external exposure while being in close proximity to the mother. Such misconceptions can lead to excessive and unnecessary anxiety among patients as well as delays in diagnosis and treatment. In this article, we hope to familiarise healthcare professionals looking after breastfeeding mothers with evidence-based recommendations and provide them with practical guidance on counselling lactating patients. On the other hand, it cannot be overemphasised that radiology professionals should be consulted prior to any radiological investigations or procedures for individual patient's consideration.

Does my patient have to abstain from breastfeeding for radiological procedures?

For diagnostic radiological investigations without the injection of contrast agents such as X-rays, fluoroscopy, mammography and computed tomography (CT), the ionising radiation associated with image acquisition has no effect on the breastmilk and as such, is safe for breastfeeding patients.

For Ultrasonography (USG) and Magnetic Resonance Imaging (MRI), no ionising radiation is administered and thus there are no radiation safety concerns. However, it is important to note that physiologic changes in the breast during lactation may limit its sensitivity when it comes to breast MRI. Therefore, radiology professionals should be consulted prior to examination.

What are the effects of intravenous contrast agents on breastmilk?

Diagnostic radiological investigations may require the use of intravenous contrast agents, such as gadolinium-based contrast agents (GBCA) in MRI and iodinated contrast media in CT.

Less than 0.04% of an intravascular dose of GBCA given to the mother is excreted into the breastmilk in the first 24 hours. As less than 1% of the GBCA ingested by the infant is absorbed into the gastrointestinal tract, the systemic dosage to the child is less than 0.0004% of the intravenous dose given to the mother. The likelihood of an adverse effect from such a minute fraction of gadolinium chelate absorbed from the breastmilk is remote.

Due to its water solubility, less than 1% of an intravenous dose of iodinated contrast media administered to a lactating woman is excreted into her breastmilk, and less than 1% of this amount will be absorbed by the infant's gastrointestinal tract. Therefore, the expected systemic dose absorbed by the infant from the breastmilk is less than 0.01% of the intravascular dose given to the mother. The likelihood of either direct toxic or allergy-like manifestations resulting from ingested iodinated contrast materials in the infant is extremely low.

There are theoretical risks to the infant through the ingestion of contrast materials, including direct toxicity and allergic sensitization or reaction. However, none of these complications have been reported. As per the American College of Radiology (ACR) guidelines, it is safe for the mother and infant to continue breastfeeding after GBCA administration for MRI and/or iodinated contrast media administration for CT. Ultimately, an informed decision to continue or temporarily stop breastfeeding should be left to the mother after these facts have been communicated. If a mother remains concerned about the potential ill effects to the infant, she may choose to abstain from breastfeeding for a period of 12 - 24 hours with expressing and discarding the breastmilk from both breasts during that period. In anticipation of this, she may choose to use a breast pump to obtain milk before the contrast study to feed the infant during the 12 to 24-hour period following the examination.

Are there other considerations in Nuclear Medicine Imaging?

The use of nuclear medicine in imaging, such as Positron Emission Tomography (PET), bone scan, thyroid imaging, renal imaging, cardiac imaging and ventilation-perfusion (V/Q) scan, has gained in popularity in recent years. These investigations involve the use of radiopharmaceuticals, which may lead to a child getting exposure to radiation. This can occur through 2 routes – via ingested milk (most common), or external exposure while in proximity to the mother.

Radiology professionals should be consulted prior to any nuclear medicine examinations or procedures, in particular, on the appropriate interval before resuming breastfeeding and the radiation risks from external exposure while in proximity to the mother, as these may need to be addressed on a case-to-case basis.

As a rule of thumb, the mother should:

- Express and store at least one breastmilk feed prior to the investigation.
- Directly breastfeed the infant prior to the administration of the radiopharmaceutical.
- Express and discard the breastmilk as completely as possible within 4 hours after the study.
  The infant can be fed stored breastmilk during this period.
- Follow specific radionuclide / radiopharmaceutical instructions for individual examinations.

What resources are available if my patients have further specific questions or they wish to find out more?

For individual patient's consideration, health professionals from the radiology service should be consulted prior to any radiological investigations or procedures.

Key Messages:

- Breastfeeding mothers may have worries and concerns about the possible risks of radiological diagnostic procedures to them and their child. This can lead to excessive and unnecessary anxiety, and thus, delays in diagnosis and treatment. Health professionals should support mothers to make an informed decision to continue or temporarily stop breastfeeding.
  授乳母親或許會擔憂放射診斷造影檢查對她和孩子可能帶來健康風險，若因此引起過度和不必要的焦慮，可能會延誤診斷和治療。醫護人員應支持母親作出知情決定，繼續或暫時停止餵哺母乳。

- For diagnostic radiological investigations without the injection of contrast agents such as X-rays, fluoroscopy, mammography and computed tomography (CT), the related ionising radiation has no effect on the breastmilk and as such, is safe for breastfeeding patients.
  一些毋需注射造影劑的放射診斷檢查（例如： X光檢查、透視檢查、乳房 X 光檢查和電腦掃描診斷）所產生的輻射不會影響母乳，因此，對母乳餵哺的母親是安全的 。

- It is generally safe for the mother and infant to continue breastfeeding after diagnostic radiological investigations which may require the use of intravenous contrast agents, such as gadolinium-based contrast agents (GBCA) in MRI and iodinated contrast media in CT.
  一般而言，母親接受使用靜脈注射顯影劑的放射診斷檢查後（例如：用於磁力共振掃描（MRI）含 Gadolinium 類成分的顯影劑和於電腦掃描診斷（CT）使用的碘化顯影劑等），繼續餵哺母乳是安全的。

- Radiology professionals should be consulted prior to the use of nuclear imaging, such as Positron Emission Tomography (PET), bone scan, thyroid imaging, etc.
  若授乳母親需要接受核子醫學檢查（例如：正電子放射掃描（PET）、骨骼掃描、甲狀腺掃描等），應先諮詢放射科醫護人員。

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