Breastfeeding and Medication

Breastfeeding and MRI Scans

Having examined all the studies, I have concluded that MRI scans with and without gadolinium contrast can be undertaken by breastfeeding mothers without interruption to feeding.

I am often asked about MRI and CT scans for breastfeeding mothers. It seems that most hospitals have guidelines that say breastfeeding mothers should stop breastfeeding for at least 24 hours.

I was interested to read the phrasing of the American College of Radiology (ACR) guideline, which states:

'For all IV iodinated contrast and gadolinium, contrast administration to the mother is considered safe for both the baby and nursing mother.' However, it goes on to say: 'Mothers who are breastfeeding should be given the opportunity to make an informed decision as to whether to continue or temporarily abstain from breastfeeding after receiving IV contrast. If the mother remains concerned about any potential ill effects to the infant, she may abstain from breast-feeding for 24 hours with active expression and discarding of 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 study to feed the infant during the 24-hour period following the examination.'

This seems to me to be open to interpretation by the radiographer depending on how supportive of breastfeeding they are.

The Royal College of Radiologists' guideline states that:

'A very small percentage of the injected dose enters the breastmilk and virtually none is absorbed from the normal gut and no special precautions or cessation of breastfeeding is required' (citing Webb, 2005). It goes on: 'Discontinue breastfeeding for 24 hours after use of a high-risk agent. The decision on whether to continue or suspend breastfeeding after use of a medium-risk or low-risk agent should be at your discretion in consultation with the mother.' (This is adapted from the MHRA recommendations 2007, a document which has been archived and I haven't been able to access.)

The RANZR guidelines (which I was told have been adopted in the UK state) categorically that:

"R29. Cessation of breast feeding or expression and discarding of breast milk after iodinated contrast media administration are not required."

Referencing

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Since the oral bioavailability of gadolinium, the contrast used in MRI, is only 0.8%, and its half-life is 1.7 hours, meaning that it has all gone from the body after 8.5 hours, why should breastfeeding be disrupted for 24 hours?

I have talked to several mothers who have refused to undergo the procedure if they could not breastfeed as normal, or who postponed it until they had pumped enough breastmilk to feed the baby for 24 hours. Cancellation of appointments is both costly to the NHS and distressing for the mother and her family. Any investigation is stressful and anxiety provoking.

Having examined all the studies, I have concluded that MRI scans with and without gadolinium contrast can be undertaken by breastfeeding mothers without interruption to feeding.

CT scans can also be carried out. A variety of contrast agents seem to be used, but the ingredients are largely based on Iohexol and Diatrizoate (using a variety of brand names). Both the American College of Radiology (ACR) and the European Society of Urogenital Radiology note that the available data suggest that it is safe to continue breastfeeding after receiving intravenous contrast. Sadly this is not reflected in local guidelines. Even when mothers taken in research evidence from Hale and LactMed, their views are dismissed, and on more than one occasion a healthcare professional has refused to conduct the investigation unless the mother signs a form undertaking not to breastfeed for the advised time.

Above taken from my book "Why Mothers Medication Matters" Pinter and Martin 2017

LactMed Oct 2018

Summary of Use during Lactation:

Amounts of gadolinium excreted into breastmilk after maternal gadopentetate are less than 1% of the amount allowed to be given to infants. In addition, because gadopentetate is poorly absorbed orally, it is not likely to reach the bloodstream of the infant or cause any adverse effects in breastfed infants. Gadopentetate has been associated with some cases of nephrogenic systemic fibrosis in patients with renal impairment. On this theoretical basis, European sources recommend that the mother pump and discard milk for 24 hours after receiving gadopentetate.[1][2] However, guidelines developed by several North American professional organizations state that breastfeeding need not be disrupted after a nursing mother receives a gadolinium-containing contrast medium.[3][4][5]

Drug Levels:

Maternal Levels. A lactating woman who was weaning her infant (time postpartum not stated) was given an intravenous dose of 5.8 mmol (5.4 g) of gadopentetate dimeglumine which was equivalent to 0.1 mmol/kg. Samples of expressed breastmilk were obtained 6 times during the following 32.7 hours with the mother trying to completely empty the breasts at each time. Milk was analyzed for elemental gadolinium. The highest amount of gadolinium in milk of 5.1 micromol/L was detected at 4.8 hours after the dose. At 22 hours after the dose, milk levels were less than 1 micromol/L. About 0.66 micromol (0.6 mg) of gadopentetate was excreted over the time of milk collection. This amounted to about 0.01% of the mother's total (not weight-adjusted) dose.[6]

A mother who was 13 weeks postpartum was given an intravenous dose of 7 mmol (6.6 g) of gadopentetate dimeglumine which was equivalent to 0.1 mmol/kg. Breastmilk was collected from each breast at 2, 11, 17 and 24 hours after the dose. Milk was analyzed for elemental gadolinium. The highest amounts in milk were in the 2-hour sample, having 2.8 and 3.4 micromol/L (2.6 and 3.2 mg/L) in the milk from each breast respectively. At 11 hours, the values were 2.8 and 2.9 micromol/L; by hour 17, the amounts in milk were at or below the detection limit of about 1 micromol/L. The authors estimated that 1.6 micromoles (1.5 mg) or 0.023% of the maternal dose (not weight-adjusted) would be excreted in the 24 hours after administration.[7]

Nineteen women received intravenous gadopentetate, in a dose of 0.1 mmol/kg (n = 18) or 0.2 mmol/kg (n = 1). The mothers withheld nursing for 24 hours and emptied both breasts completely at times chosen by the mother based on her own normal breastfeeding times. For the 18 subjects who received the lower dose, the average dose in milk was 5.9 mmol (range 4.8 to 7.4 mmol). The woman who received double the dose had milk gadolinium excretion in the same range as the others. Milk was analyzed for elemental gadolinium. The time of the peak gadolinium level in milk varied between 1 and 8 hours after the dose in 15 of the women; in 3 women, the peak values occurred at 9, 11 and 13 hours after the dose. The total amount excreted in milk averaged 0.57 micromoles (range 0.052 to 3 micromoles). The average amount excreted was 0.009% of the administered dose (range 0.001 to 0.4%). The authors concluded that breastfed infants would ingest less than 1% of the usual maximal neonatal dose of 0.2 mmol/kg and that this dose would not warrant discontinuing breastfeeding after gadopentetate administration.[8]

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Hale TW Medications and Mothers Milk Online access Oct 2018

Trade: Gadolinium, Magnevist, Magnevistan, Magnograf, Viewgam

Gadopentetate is a radiopaque agent used in magnetic resonance imaging of the kidney. It is non-ionic, non-iodinated, has low osmolarity and contains a gadolinium ion as the radiopaque entity. Following a dose of 7 mmol (6.5 g), the amount of gadopentetate secreted in breastmilk was 3.09, 2.8, 1.08, and 0.5 µmol/L at 2, 11, 17, and 24 hours respectively.[1] The cumulative amount excreted from both breasts in 24 hours was only 0.023% of the administered dose. Oral absorption is minimal, only 0.8% of gadopentetate is absorbed. These authors suggest that only 0.013 micromole of a gadolinium-containing compound would be absorbed by the infant in 24 hours, which is incredibly low. They further suggest that 24 hours of pumping would eliminate risk, although this seems rather extreme in view of the short (1.6 hours) half-life, poor oral bioavailability, and limited milk levels.

In another study of 19 lactating women who received 0.1 mmol/kg and one additional woman who received 0.2 mmol/kg, the cumulative amount of gadolinium excreted in breastmilk during 24 hours was 0.57 µmol/L.[2] This resulted in an excreted dose of <0.04% of the IV administered maternal dose. A similar amount was noted in the patient receiving a double dose (0.2 mmol/kg). As a result, for any neonate weighing more than 1000 gm, the maximal orally ingested dose would be less than 1% of the permitted intravenous dose of 0.2 mmol/kg. According to the authors, the very small amount of gadopentetate dimeglumine transferred to a nursing infant does not warrant a

potentially traumatic 24-hour suspension of breastfeeding for lactating women. The American College of Radiology concludes that it is safe for a mother-infant dyad to continue breastfeeding after the administration of a gadolinium-containing contrast medium. In another review, only miniscule amounts of gadolinium contrast agents reach the milk compartment and virtually none of this is absorbed orally by the infant.[3]

T ½ 1.5-1.7 h, Oral bioavailability 0.8%, relative infant dose 0.02% - 0.04%

Adult Concerns

Headache, dizziness, nausea, vomiting, pain at injection site, hypersensitivity.

References

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