Medications and Breastfeeding: the evidence for safe prescribing

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The advantages of breastfeeding are well established.
“Immunisation is preventative medicine par excellence. If a new vaccine became available that could prevent 1 million or more child deaths a year and that was moreover, cheap, safe, administered orally and required no cold chain, it would become an immediate public health imperative.”

“Breastfeeding could do all this and more, but it requires its own ‘warm chain’ of support that is skilled care for mothers to build their confidence and show them what to do, and protect them from harmful practices.”

The Lancet, 1994
The high point......
Recommendation 15
Who is the target population?
Hospital doctors, GPs, obstetricians, pharmacists, specialist nurses, dentists and PCT medicine management teams.

Who should take action?
NHS trusts responsible for maternity care and GP surgeries, community health centres, pharmacies and drug and alcohol services.

What action should they take?
• Ensure health professionals and pharmacists who prescribe or dispense drugs to a breastfeeding mother consult supplementary sources (for example, the Drugs and Lactation database [LactMed] or seek guidance from the UK Drugs in Lactation Advisory Service.
• Health professionals should discuss the benefits and risks associated with the prescribed medication and encourage the mother to continue breastfeeding, if reasonable to do so. In most cases, it should be possible to identify a suitable medication which is safe to take during breastfeeding by analysing pharmokinetic and study data. Appendix 5 of the 'British national formulary' should only be used as a guide as it does not contain quantitative data on which to base individual decisions.
• Health professionals should recognise that there may be adverse health consequences for both mother and baby if the mother does not breastfeed. They should also recognise that it may not be easy for the mother to stop breastfeeding abruptly – and that it is difficult to reverse.
The Dilemma

• We want the “purest” breast milk possible

• Does taking medication and breastfeeding pollute the milk?

• Does taking medication and breastfeeding risk harming the baby?
Breastfeeding mothers take medicines

• How can we decide which drugs they can take – and have a reasonable quality of life?

• What resources do we have?

• What resources do we need
  – As healthcare professionals
  – As mothers

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We know..

- 65.9% of women have taken a drug whilst breastfeeding a baby < 6 months
- 79.6% of formula feeding mothers have taken a drug whilst breastfeeding a baby < 6 months

Stop breastfeeding and take this medicine?

Advising a mother to stop breastfeeding to take medication should be the final resort having taken into account the risk of denying the baby the right to continued breastfeeding balanced against the need for any particular drug, given full, quantitative data.

Shift the emphasis
What sources do most prescribers have access to?

- BNF
- Data is not quantitative
- It is based on manufacturer recommendation
- Does it make allowance for age of baby?
- Does it provide outcome data?
How do I make a decision on whether a drug is safe enough for donation?

• Expert sources of information – LACTMED, Hale Medications and Mothers Milk, PubMed searches
  – Outcome studies
  – Possible adverse effects
  – Risk of effect on pre term
  – Long term drug or acute course
  – Pharmacokinetics of drug

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Inter cellular spaces

- In the first few days intercellular spaces are wide allowing passage of large molecules like immunoglobulins
- But also allows free passage of drugs
- This is the time we probably administer most medications to breastfeeding women
- Later inter cellular pores have closed so passage of drugs has to be across 2 lipid barriers

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Plasma Protein Binding

• Drugs which are highly bound to proteins in the maternal plasma are unable to transfer into breastmilk in high levels

• Ideal drug is highly protein bound >90%
Milk Plasma Ratio

• the higher the M/P ratio, the more drug is found in breastmilk

• We want drugs with M/P ratio <1
Half life

- Choose drugs with shorter half lives so there is less likelihood of accumulation
- Some drugs may be slowly metabolised by neonates leading to accumulation
- If $t_{1/2} > 24$ hours there are more problems likely
- $t_{1/2}$ may vary in baby and mother eg pethidine - mother 3.2 h, neonate up to 63 hours
If half life is 24 hours

50% left plus 100% = 150%

so drug accumulates
If half life is >24 hours we MIGHT have 80% left at 24 hours plus 100% = 180% and baby at risk of side effects.
Therapeutic Range

Above this level would have side effects

Within this level has an effect

Below this level doesn’t have any effect on baby

Graph to show drug concentration in the blood and therapeutic range
Oral Bio-availability

• If there is no oral form of a drug
• If it has low oral bioavailability
• It can’t be absorbed by the baby even if it gets into breastmilk

Example gentamycin
In an ideal world

- Outcome studies
- No adverse effects
- High plasma protein binding
- Low milk plasma ratio
- Short half life
- Low oral bioavailability
- Amount passing through breastmilk < dose licensed for baby
Loratadine

- Milk Plasma ratio 1.17 (above 1)
- Plasma protein binding 97%
- Half life 8.4-28 hours
- Oral bioavailability complete
- Dose in a 2 year old 5mg day, adult 10mg day
- Relative infant dose 0.3-1.2 (2.9 μg/kg/day)
Mothers who have been told they can't breastfeed on medication may request donor milk for their baby knowing the advantages of breastmilk for their baby.

Recent Examples: Mum with MS, Crohn’s Disease, Breast Cancer
Can she really not breastfeed?

• MS mum on beta interferon not orally bio available

• Copaxone
  – No information is available on the excretion of glatiramer into breastmilk. However, data from the manufacturer indicates that after subcutaneous injection, glatiramer undergoes rapid degradation to amino acids and shorter peptides and that it cannot be detected in the plasma, urine or feces.[1] Furthermore, any glatiramer that did reach the breastmilk would probably be destroyed in the infant's gastrointestinal tract and not absorbed, except perhaps in neonates. Limited information indicates that maternal use of glatiramer does not cause any adverse effects in breastfed infants.
Mum with Crohn’s disease

Humira (baby didn’t tolerate formula 28/40)

- Limited information indicates that maternal adalimumab injections produce low levels in milk and do not adversely affect the nursing infant. Because adalimumab is a large protein molecule with a molecular weight of about 148,000, the amount in milk is likely to be very low and absorption is unlikely because it is probably destroyed in the infant’s gastrointestinal tract. Most experts feel that the drug is probably safe during nursing. However, until more data become available, adalimumab should be used with caution during breastfeeding, especially while nursing a newborn or preterm infant.
What sort of questions do we get asked on the helpline

My baby is 6 weeks old and I want to get a tattoo of her name put on my wrist.

Is that OK if I’m breastfeeding?
Is it ok if I have false nails fitted and painted whilst I’m breastfeeding?

Also I want to have a spray tan, the lady in the salon says it will make the milk taste odd.

I’m getting married next week, my baby is 3 months old and is coming on the honeymoon too
I need to have an in-growing toe nail removed. The podiatrist says I have to stop breastfeeding for several days or it could seriously harm my baby. She is 6 weeks old and won't take a bottle. The lady said when she's hungry enough she will. They are going to use phenol and a local anaesthetic.
My baby is going to be delivered by c section next Monday. I was diagnosed with oral cancer a month ago.

When the baby is 2 weeks old they want to remove my tongue and then give me chemotherapy and radiotherapy.

I’d like to do as much breastfeeding as possible and keep my supply for after the treatments, is that possible?
Enabling women to breastfeed

- Women and infants need their doctors (and pharmacists) to advocate breast feeding, to learn the basic skills, to ensure that breast feeding is protected, and to support their colleagues who are working to promote and protect breast feeding

Is prescribing for a breastfeeding mother simple?

- 33.9% (53) of GPs and 56.8% (88) of paediatricians said they felt competent to advise on prescribing to breastfeeding mothers.

- But only 19.2% of GPs and 41.3% of paeds identified it as a very important training need.

SSRI

**Fluoxetine**
- Plasma Protein binding 94.5%
- Milk plasma ratio 0.286-0.67
- Half life 2-3 days
- Relative Infant dose 7.7%

**Citalopram**
- Plasma Protein binding 80%
- Milk plasma ratio 1.16-3
- Half life 36 hours
- Relative Infant dose 3.6%

**Sertraline**
- Plasma Protein binding 98%
- Milk plasma ratio 0.89
- Half life 26 hours
- Relative Infant dose 0.4-2.2%

**Outcome studies**
- Mother previous experience of SSRI

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## Diabetes

### Insulin
- Plasma Protein binding
- Milk plasma ratio
- Half life 4-6 minutes
- Relative Infant dose
- Oral bioavailability 0
- Stability of mothers glucose levels

### Metformin
- Plasma Protein binding minimal
- Milk plasma ratio 0.35-0.63
- Half life 6.2 hours
- Relative Infant dose 0.3-0.7%
- PCOS and low milk supply
- Risk of diabetes if not breastfed

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Asthma

- Inhalers – salbutamol, steroids, salmeterol
- Oral corticosteroids
- Montelukast
  - Plasma Protein binding 99%
  - Milk plasma ratio Half life 2.7-5.5 hours
  - Relative Infant dose
  - Paediatric license
- Risk to child if not breastfed
Epilepsy

- **Lamotrigine**
  - Plasma Protein binding 55%
  - Milk plasma ratio 0.562
  - Half life 29 hours
  - Relative Infant dose 9.2-18.27%

- **Carbamazepine**
  - Plasma Protein binding 74%
  - Milk plasma ratio 0.69
  - Half life 18-54 hours
  - Relative Infant dose 3.8-5.9%

Maternal sleep disturbance – co-sleeping
Conclusion

• We need to make evidence based decisions on the safety of drugs taken by mums

• Sometimes mums are told they can’t breastfeed not based on evidence but often on personal experience
Promote
Protect
Support
Breastfeeding

Good attachment - working together!

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