Maternal infectious diseases, antimicrobial therapy or immunizations: Very few contraindications to breastfeeding

The Canadian Paediatric Society recommends exclusive breastfeeding as the optimal method of infant feeding for the first six months of life for healthy, term infants (1). There are many benefits associated with breastfeeding, including nutritional, immunological, psychological, developmental, environmental, social, economic and health (eg, decrease in infectious diseases) (2-4). To promote, protect and support breastfeeding, every effort must be made to minimize contraindications to breastfeeding, particularly unnecessary ones. The present article summarizes the maternal infectious diseases in which continuing breastfeeding is recommended, the very few infectious diseases in which it is not recommended, the rare instances in which maternal antimicrobial therapy indicates a caution for breastfeeding, and the continuation of breastfeeding when a mother or her infant is receiving a routine recommended immunization.

MATERNAL INFECTIOUS DISEASES AND BREASTFEEDING

Human breast milk is not sterile; it frequently contains organisms found in the mother's microbial skin flora (5). Normal healthy breastfeeding infants become colonized with their mother's flora over time (6). While breast milk can be a source of maternally derived commensal and pathogenic microorganisms, there are very few maternal infectious diseases for which cessation or interruption of breastfeeding is indicated (2,7-9).

When a nursing mother presents with symptoms of an infectious disease, she has already exposed her infant to the pathogen. Cessation of breastfeeding does not prevent exposure, and may instead decrease the infant's protection. When breastfeeding, both the mother and infant can continue to breastfeed if the mother's health is not compromised are not contraindicated for breastfeeding (Table 1).

Maternal bacterial infections are rarely complicated by transmission to the infant through breastfeeding. Mothers with mastitis or breast abscesses should be encouraged to continue breastfeeding (5,7,9). In instances of breast abscess where pain interferes with breastfeeding, the infant can continue to breastfeed on the nonabscessed breast. Similarly, maternal tuberculosis (TB) is compatible with breastfeeding, provided the mother is not contagious or she has received two weeks of appropriate TB treatment (7-9). Continuing breastfeeding while on TB therapy is not a problem, as these drugs appear to be safe for use with breastfeeding (8,10,11). Breastfed neonates of women on isoniazid therapy should receive a multivitamin supplement, including pyridoxine (12). If both mother and infant are taking isoniazid, then there are concerns about possible excessive drug concentration in the infant (12). Consultation with an expert is indicated.

With parasitic infections such as malaria, breastfeeding should be continued provided the mother's clinical condition allows for it. While the antimalarials chloroquine, hydroxychloroquine and quinine are found in variable quantities in breast milk, all three are regarded as compatible with breastfeeding (10) unless the infant has glucose-6-phosphate dehydrogenase (G6PD) deficiency, in which case withdrawal of quinine is advised (11). Similarly, primaquine should not be used unless both the mother and infant have normal G6PD levels. Precautions to minimize insect-borne infections should be encouraged. Insect repellents help to reduce mosquito bites, which may transmit malaria or viruses such as West Nile. There are no reported adverse events following use of repellents containing diethyltoluamide or picaridin in breastfeeding mothers (13).

While maternal fungal infections such as candidal vaginitis can lead to infant colonization, this is not a contraindication to breastfeeding, nor is maternal treatment with topical or systemic antifungal agents such as fluconazole (8,11).

For most maternal viral infections, ongoing breastfeeding is recommended with few exceptions (Table 1) (7,8). With maternal HIV infection, in resource-rich settings such as Canada, where a safe and culturally accepted replacement is available, breastfeeding is not recommended because HIV transmission to the infant has been well documented (8,9,14-16). Emotional support for the mother to not breastfeed may be required; in some instances, financial support for formula purchase may be necessary as well. In more resource-limited settings, the optimal feeding method for infants whose mothers are HIV positive is still unclear (16). Breastfeeding is also not advised for mothers who have received two weeks of appropriate TB treatment (7-9).
with human T-lymphotropic virus type 1 or 2 infection. (7,8). In mothers with latent cytomegalovirus (CMV) infection, the virus reactivates in breast milk during the postpartum period and can be transmitted to the infant with breastfeeding (9). This does not pose a risk to the term infant because serious disease is prevented by placentally transferred maternal antibody. For premature infants, especially those less than 32 weeks gestation, breastfeeding from a CMV-positive mother is controversial. However, recent studies suggest that that the relative incidence and severity of CMV disease in such premature infants are low, and that the rate of CMV acquisition is not much different from the rate of acquisition in premature infants fed CMV-negative breast milk (17,18), providing further support for fresh breast milk feeding even if the mother is CMV positive (19).

### MATERNAL ANTIMICROBIAL THERAPY AND BREASTFEEDING

There are very few instances in which maternal therapy with commonly used antimicrobial agents precludes continuation of breastfeeding (8,10,11) (Table 2). Even maternal therapy with tetracycline, aminoglycosides or quinolones is not an indication to withhold breastfeeding.

### MATERNAL IMMUNIZATION AND BREASTFEEDING

Breastfeeding is not a contraindication to the administration of routine recommended vaccines to the infant or the mother (20).
TABLE 2
Selected maternal antimicrobial therapies and corresponding breastfeeding management for healthy term infants

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Breastfeeding recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1: Penicillins, cephalosporins, carbapenems, macrolides, aminoglycosides, quinolones</td>
<td>Continue breastfeeding</td>
</tr>
<tr>
<td>Group 2: High-dose metronidazole</td>
<td>Discontinue breastfeeding for 12 h to 24 h to allow excretion of dose</td>
</tr>
<tr>
<td>Group 3: Chloramphenicol</td>
<td>Caution: Possible idiosyncratic bone marrow suppression</td>
</tr>
<tr>
<td>Group 4: Trimethoprim/sulfamethoxazole, sulfisoxazole, dapsones</td>
<td>Proceed with caution if nursing infant has jaundice or G6PD deficiency, and also if ill, stressed or premature</td>
</tr>
<tr>
<td>Antitubercular drugs</td>
<td></td>
</tr>
<tr>
<td>Isoniazid, rifampin, streptomycin, ethambutol</td>
<td>Continue breastfeeding. While mother is taking isoniazid, administer pyridoxine for the nursing infant</td>
</tr>
<tr>
<td>Antiparasitics</td>
<td></td>
</tr>
<tr>
<td>Group 1: Chloroquine, quinidine, ivermectin; maternal topical diethyltoluamide or picaridin</td>
<td>Continue breastfeeding</td>
</tr>
<tr>
<td>Group 2: Primaquine, quinine</td>
<td>Contraindicated during breastfeeding unless both mother and baby have normal G6PD levels</td>
</tr>
<tr>
<td>Antifungals</td>
<td></td>
</tr>
<tr>
<td>Fluconazole, ketoconazole</td>
<td>Continue breastfeeding</td>
</tr>
<tr>
<td>Antivirals</td>
<td></td>
</tr>
<tr>
<td>Acyclovir, valacyclovir, amantadine</td>
<td>Continue breastfeeding. If considering prolonged use of amantadine, observe for milk suppression, as it can suppress prolactin production</td>
</tr>
</tbody>
</table>

Data from references 8, 10, 11 and 13. G6PD Glucose-6-phosphate dehydrogenase

REFERENCES

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The recommendations in this statement do not indicate an exclusive course of treatment or procedure to be followed. Variations, taking into account individual circumstances, may be appropriate. Internet addresses are current at time of publication. This article also appears in the October 2006 issue of Paediatrics & Child Health [Paediatr Child Health 2006;11(8):489-491].
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