

DRUG INFORMATION

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SAFETY OF DOXYCYCLINE IN BREASTFEEDING

Question:

A patient has received a 10 day course of doxycycline while breastfeeding a 14 month old. What is the safety of this?

Answer:

It can be estimated that a breastfeeding infant would ingest approximately 3-7% of the maternal doxycycline dose, after adjusting for the difference in body weight^[1]. For most drugs, an infant dose (mg/kg) that is less than 10% of the maternal dose (mg/kg), is considered compatible with breastfeeding. For drugs with greater inherent toxicity such as cytotoxic therapy, this cut-off is too high and breastfeeding is usually considered contraindicated.

It is usually recommended that tetracyclines are avoided during pregnancy, breastfeeding and in children prior to pubescence because of concern regarding the potential for adverse effects on developing bone and teeth^[1-6]:

- *Bone*: tetracyclines chelate with newly formed bone producing a complex which may temporarily inhibit bone growth. However, this effect is reported to be reversible upon cessation of drug therapy^[5,7].
- *Teeth*: tetracycline exposure during pregnancy, or in children up to 4-6 months of age may result in staining of deciduous teeth while permanent teeth may be affected until seven to eight years of age^[2,8]. In general, the degree of tetracycline tooth staining and/or hypoplasia is considered to be dose-dependent and the risk of staining increases with total dose and duration of therapy^[9]. The limited information available suggests that doxycycline has a lower potential for tooth discolouration compared with other tetracyclines. This may relate to the lower potential for doxycycline to bind to calcium in enamel and dentine^[10-12].

In this case, there are several factors which may reduce infant exposure to doxycycline:

- Reduced absorption of doxycycline from the infant's gastrointestinal tract may occur secondary to complex formation. Doxycycline binds to divalent cations including calcium in maternal milk. Ingestion with milk is suggested to reduce the oral availability of doxycycline by 20%^[14].
- The advanced age of this infant will also serve to reduce doxycycline exposure since the infant will have enhanced ability to eliminate drugs due to the physiological maturity of the kidneys and liver.
- The use of non breast-milk foods in this 14 month old will further reduce the magnitude of doxycycline ingestion via breast milk.

The American Academy of Pediatrics considers that short courses of tetracycline are not overly problematical^[1]. Specific comments on doxycycline were not available^[1].

Conclusions:

An infant is likely to receive 3-7% of a maternal doxycycline dose, after adjusting for the difference in body weight. For most drugs, a weight adjusted maternal dose of less than 10% is considered compatible with breastfeeding. In this case, infant exposure will be reduced by a) chelation in milk, b) reduced exposure to breast milk, and c) increased hepatic and renal function.

It is generally recommended that tetracyclines are avoided during lactation due to the potential for adverse effects on developing teeth and bone, although some suggest short courses may not be problematical. In this case, we cannot exclude the possibility that doxycycline exposure via breast milk may affect developing bone and teeth. However, the risk would appear to be very low.

References:

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