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# Delivery, breast feeding and child rearing in women with epilepsy

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### *Abstract*

The occurrence of seizures during delivery is very low and convulsive status epilepticus is rare. Seizure freedom for at least 9 months prior to pregnancy is associated with a high likelihood of remaining seizure-free during pregnancy. Mode of delivery during pregnancy is most often based on obstetrical indications. Recent evidence shows good maternal and fetal outcome for pregnancy in women with epilepsy. Breastfeeding is encouraged for most mothers with epilepsy and is generally safe. There is a large knowledge gap on studies looking into the child rearing knowledge and practice of mothers with epilepsy.

## SEIZURES DURING DELIVERY AND PREGNANCY

On average, 5% women with epilepsy (WWE) have been reported to have seizures during labour, delivery, or the first 24 perinatal hours. In the largest prospective study on seizure control throughout a complete pregnancy of 1,736 pregnant women with epilepsy, seizures occurred during delivery in 3.5%.Of these seizures, 1.6% were cases of single primary or secondary generalized tonic-clonic seizures and only one case (0.06 %) of convulsive status epilepticus. The only significant factor associated with the risk of seizures during delivery was the occurrence of seizures earlier during pregnancy. No particular risk factor was identified for the development of status epilepticus.[1]

Recent evidenced-based review from the American Academy of Neurology (AAN) from 1985 to February 2008 do not suggest high rates of seizure increase or status epilepticus during pregnancy or an increased risk of seizure relapse during pregnancy for WWE who are seizure-free. ”Seizure freedom for at least 9 months prior to pregnancy is probably associated with a high likelihood (84%–92%) of remaining seizure-free during pregnancy)”.[2]

The above data emphasizes the importance of achieving seizure freedom not only prior to pregnancy but also during pregnancy to decrease the chances of seizure recurrence during delivery.

## MODE OF DELIVERY

Epilepsy *per se* is not an indication for elective caesarean section or induction of labor.[3,4] Caesarean section is recommended if frequent tonic-clonic seizures or other seizures greatly impair cooperation in the forthcoming labour and delivery[3], and may be indicated if birth is excessively prolonged particularly in generalized epilepsy where sleep deprivation increases the risk of a seizure.[4]

A caesarean delivery may be necessary if a generalised tonic-clonic seizure occurs during labour or in refractory status epilepticus in the third trimester of pregnancy. These are unusual occurrences and most women with epilepsy have normal deliveries.[3]

## MATERNAL AND FETAL OUTCOME

The same AAN review also reported no conclusive evidence of an increased risk of many obstetrical complications often discussed as associated with WWE during pregnancy and further stated that this raises the possibility that there is no true difference in the rates of obstetrical complications in WWE compared to the general population. The report states **“***there is probably no substantially increased risk (greater than two times expected) of cesarean delivery or late pregnancy bleeding, and probably no moderately increased risk (greater than 1.5 times expected) of premature contractions or premature labor and delivery”*.[2]

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A more recent population-based cohort study from Norway involving 2,805 pregnancies in women with a current or past history of epilepsy confirms the low complication rate for pregnant women with epilepsy showing a slightly increased risk of induction, caesarean section and postpartum haemorrhage. (OR 1.3, 1.4, 1.2 respectively).[5]

Neonates of WWE taking antiepileptic drugs (AEDs) probably have an increased risk of being small for gestational age and possibly have an increased risk of a one-minute Apgar scores of < 7.( about 2x the expected rate).[6]

Lin *et al* reported that only approximately 14% of the WWE in a cohort of 1,182 women received AED treatment during gestation. They found no significant difference in the risk of low birth weight infants, preterm births and small for gestational age babies between mothers with epilepsy receiving treatment during pregnancy and mothers without epilepsy. The adjusted odds of low birth weight, preterm births and small for gestational age babies for women with epilepsy not on AED treatment during pregnancy were 1.31,1.35 and 1.23 times than that of women without epilepsy.[7]

## BREAST FEEDING

*Placental transfer and antiepileptic drug exposure*

All AEDs can cross the placenta and are excreted into the breast milk at various ratios of breast milk concentration/maternal serum concentration (M/S ratios). The amount of AED exposure to the infant depends on 1) Maternal serum concentration; 2) Extent of breast milk transfer; 3) Quantity of milk intake by the infant; and 4) Infant's pharmacokinetics.[8]

AEDs in infants have a longer half-life than those in adults during the first week postpartum.[9] In premature infants, the half-life of AEDs is much longer compared to full term infants.[10]

*Conventional antiepileptic drugs*

Conventional AEDs such as carbamazepine, phenytoin and valproic Acid have not been found to transfer into breast milk in clinically relevant amounts and are generally considered safe for use during breast-feeding.[11,12] Sedation has been reported with phenobarbital and exposure to chronic use of benzodiazepines.[8,13]

Mothers taking benzodiazepines, phenobarbital and primidone may be advised to follow a mixed regimen of breast-feeding and bottle feeding for the first 5 to 7 days postpartum, due to the delayed elimination of AEDs in infants.[12] This is especially important for mothers receiving phenobarbital and primidone in combination with valproic acid, which can result in increased phenobarbital concentrations in maternal serum and breast milk.[14]

Ethosuximide has a high M/S ratio and longer half-life in infants and may reach levels in which pharmacological effects maybe seen in breastfed infants, although there is no clear support for the occurrence of side effects in neonates.[8,12] Mixed feeding maybe recommended.

*New antiepileptic drugs*

Breast milk transfer of gabapentin, levetiracetam, oxcarbazepine and topiramate is considerable. However, serum concentrations in breastfed infants are generally low and pharmacological effects are unlikely to occur [8,15-17] Although no side-effects have been reported in neonates exposed to these AEDs, data is insufficient to determine whether or not these AEDs in breast milk can clinically affect infants.[12,18]

Lamotrigine possibly transfer into breast milk in clinically important amounts, although no adverse effects on infants were observed in most reported cases.[8,12,19] Breast-fed infants should be closely monitored for possible adverse effects such as sedation, poor suck and apnea.[12,20]

Zonisamide exposure in breastfed infants maybe potentially clinically significant based on the high M/S ratios and longer half-life in infants, although no data is available for the effects of breast feeding on infants. Mixed feeding maybe recommended.[12]

For several of the newer AEDs, lacosamide, tiagabine, pregabalin and vigabatrin, data on breast-feeding are lacking and warrants further studies.[8]

*Cognitive outcome of breastfed infants*

Cohen *et al*, as part of the Neurodevelopmental Effects of Antiepileptic Drugs (NEAD) Study looked into the 3 year cognitive outcome between breastfed and non-breastfed children of mothers on AED monotherapy with carbamazepine, lamotrigine, phenytoin and valproic acid. IQs for breastfed children did not differ from non-breastfed children. However, this preliminary analysis is limited by the small sample size.[21]

*Recommendation*

In general, WWE should be encouraged to breastfeed their infants. In most cases, the risk

of adverse effects due to exposure through breast milk is negligible.[8] Breastfed infants should be monitored for possible adverse effects such as sedation, poor suck, AED withdrawal symptoms and respiratory depression esp. If the mother is taking barbiturates and benzodiazepines.[8,12,13]

## CHILD REARING

The mother and the rest of the family members should be counselled to ensure both the safety of the infant and the mother in case the mother should have a seizure.

Among the safety measures include diaper changing on the floor, (to avoid any risk of the child falling if the mother should have a seizure) and bathing infants only in the presence of another adult.[22]

There is a large knowledge gap on studies looking into the child rearing knowledge and practice of mothers with epilepsy. To my knowledge, only 2 studies from India address this issue.[23,24] Saramma *et al* in 2006, compared the knowledge and practice of child rearing in 20 mothers with epilepsy with a pretested questionnaire, and compared it with that of 20 mothers without epilepsy matched for age, parity and education.[23]

Knowledge on safety needs of infants and the mean score on child rearing practice(CRP) was significantly lower for MWE than for MWoE. Over all knowledge on child rearing was comparable for both groups. There was a trend towards better CRP as the knowledge on child rearing increased.

The same lead author subsequently reported on a new instrument that can be used to evaluate child rearing knowledge and practice under the four major domains of child rearing. (Designed for administration to women during pregnancy or in the post-partum period up to 4 months) The child rearing knowledge scale (CRKS) and child rearing practice scale (CRPS) were found to be valid, reliable instruments to measure maternal child rearing knowledge and practices of women with epilepsy. They concluded that these scales have potential application in clinical research.[24]

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