When should a woman with epilepsy begin to think about issues surrounding family planning? The answer is – it’s never too soon. While having a baby may not be high on the agenda for most teenage girls, adolescence is the prime time to take a long-term look at treatment and the affects that medication may have on fertility, contraceptives and future pregnancies. Dr Jim Morrow and epilepsy specialist nurse Beth Irwin of the UK Epilepsy and Pregnancy Register look at issues facing all women of child bearing age and explain the importance of ensuring they are prescribed the right anti-epileptic drugs from the start.

In an ideal world all women of child bearing age would look at their health, diet and lifestyle long before they considered starting a family.

In reality a baby on the way is often the wake-up call that motivates us to address such issues and discover the joy of a good night’s sleep. But for women with epilepsy, there are extra factors to consider which it is essential to address long before a baby is planned.

Diagnosis of epilepsy is often made in childhood and the primary goal is to achieve seizure freedom. Anti-epileptic drugs (AEDs) are chosen that will have the least possible impact on cognitive abilities, with academic performance being of primary importance. This is the same for both boys and girls. But as young girls reach their teenage years, issues become more complex.

While freedom from seizures remains the goal, consideration must also be given to the impact that some AEDs may have on a woman’s fertility, use of contraceptives and pregnancy. Although the likelihood of a baby may be a long way off, the risk of certain AEDs to any future unborn child must also be taken into account. It is essential, therefore, to ensure that even in her teenage years, a young woman’s therapy is tailored for her long-term reproductive health.

Before looking at individual issues, however, it is important to stress that the majority of women with epilepsy conceive without problems and enjoy uncomplicated pregnancies. Furthermore, over 90% of women with the condition deliver healthy babies without undue problems.

The outlook is both positive and reassuring.
**Fertility**

There are conflicting theories on the effect that epilepsy and AEDs may have on fertility. However for the majority of women who wish to conceive, they generally do so with few problems. Nevertheless some drugs may be linked with infertility. In men, certain AEDs may reduce sperm production while in women Polycystic Ovary Syndrome (PCOS) or irregular periods can have an impact. PCOS occurs when eggs from the ovary do not develop properly and remain in the ovary forming non-harmful cysts. This can make it more difficult to conceive.

PCOS tends to be more common in women with epilepsy and is thought to be linked to the AED sodium valproate. Both reduced sperm production and PCOS are treatable but they may make it slightly more difficult to conceive.

**Contraception**

Family planning often begins with contraception and certain methods may be less effective than others for women taking AEDs. Barrier methods such as condoms, caps and diaphragms are not affected by AEDs, nor are intrauterine devices (IUDs), intrauterine systems (IUSs) or contraceptive injections. Certain AEDs, however, may interfere with the effectiveness of the oral contraceptive Pill.

AEDs fall into two categories: enzyme-inducing drugs and non-enzyme-inducing drugs (see table above). Enzyme-inducing drugs speed up the metabolism of hormones in the body, including those present in the contraceptive Pill, with the potential to make it less effective. Non-enzyme-inducing drugs do not affect the Pill, so this may be a good choice for those taking AEDs in this category.

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**ENZYME-INDUCING AEDS THAT MAY INTERFERE WITH HORMONAL BIRTH CONTROL**

- Carbamazepine (Tegretol)
- Phenytoin (Epanutin)
- Phenobarbital (Phenobarbitone)
- Primidone (Mysoline)
- Topiramate (Topamax)
- Oxcarbazepine (Trileptal)
- Rufinamide (Inovelon)
- Eslicarbazepine (Zebinix)

**NON-ENZYME-INDUCING AEDS THAT DO NOT INTERFERE WITH HORMONAL BIRTH CONTROL**

- Pregabalin (Lyrica)
- Levetiracetam (Keppra)
- Clonazepam (Rivotril)
- Clobazam (Frisium)
- Gabapentin (Neurontin)
- Ethosuximide (Zarontin)
- Vigabatrin (Sabril)
- Tiagabine (Gabatril)
- Sodium valproate (Epilim)
- Zonisamide (Zonegran)
- Acetazolamide (Diamox)
- Lacosamide (Vimpat)

**Lamotrigine (Lamictal)**

Lamotrigine (Lamictal) does not fall into either of these two categories above. This is because while it is a non-enzyme inducing drug, evidence suggests that it may reduce the effectiveness of the contraceptive Pill and that the Pill may lower lamotrigine levels in the blood, possibly giving rise to seizures.

For those women who are taking enzyme-inducing AEDs, there are several points to remember:

- The combined oral contraceptive Pill may be affected and a higher dose may be required. However, there can still be a risk of pregnancy and it may be wise to also use a barrier method.
- The progestogen-only Pill or ‘mini Pill’ and contraceptive implants are not recommended because of their high failure rate in women in this category. They are also not advised with lamotrigine.
- If you require emergency contraception you may need to take a larger dose of the morning-after pill, as prescribed by your GP.
- The important thing is to talk through your choice of contraception with your neurologist or family planning adviser.

It is important to stress that the majority of women with epilepsy conceive without problems and enjoy uncomplicated pregnancies. Furthermore, over 90% of women with the condition deliver healthy babies without undue problems. The outlook is both positive and reassuring.
Pre-conceptual counselling

Pre-conceptual counselling aims to underline the fact that the best possible outcome for any pregnancy can be achieved if it is planned well before conception, even if pregnancy is not envisaged for some years. This allows time for medication to be optimised, seizures to be controlled and risks to the unborn child to be minimised.

Because of the possible effects of AEDs on a developing foetus, it is recommended that your medication is reviewed prior to becoming pregnant, so that you and your neurologist can ensure you are taking the most suitable AEDs at the best dose. That way, when the time is right, you have the best chance of enjoying a healthy pregnancy and delivering a healthy, happy baby.

Seizures

Pre-conceptual counselling is an ideal time to review the continued need for AED treatment. The gold standard is that women should enter pregnancy having complete seizure control or as few seizures as possible. If a person has been seizure free for at least two to three years and does not have juvenile myoclonic epilepsy, difficult-to-control seizures, multiple drug regimes, or an abnormality that has caused the epilepsy, it may be possible to re-evaluate the need for continuing AED therapy. However, this should only be considered in conjunction with an epilepsy specialist and sudden withdrawal of drugs should be avoided.

If you have seizures during pregnancy, there could be a risk of injury to you and your baby. While there is no evidence that simple partial, complex partial, absence or myoclonic seizures will harm your unborn baby, tonic clonic seizures could cause you to miscarry or harm yourself or the baby.

Birth defects

Perhaps one of the most worrying aspects of pregnancy for any woman with epilepsy is the possible effects her AEDs could have on her unborn child. Although during pregnancy a woman’s bloodstream is separate from that of her baby’s, certain substances can cross the placenta and these include AEDs. Some AEDs can affect the development of the baby with the possibility of birth defects, particularly in the first 12 weeks when the main organs and skeleton are forming.

Birth defects are divided into two groups: minor malformations include small fingers and toes and wide-set eyes; major malformations include a hole in the heart, cleft lip and cleft palate, as well as neural tube defects.

It is true that women with epilepsy have a slightly higher chance of having a baby with a birth defect than those who do not have the condition, but the risk is small and must be put into context.

In the general population, one to two women in every 100 (1–2%) will have a baby with a major malformation. The risk increases to 3% in women with epilepsy who don’t take AEDs, and 4–9% in those who do.
Although these figures are helpful, they do not show the chance of these problems happening to you. Individual risks vary depending on the type and dose of AED you are taking and are often greater if you are taking more than one drug. This is why preconception counselling is essential to allow time for any changes or discontinuation of anti-epileptic treatment to be carried out or, if necessary, for seizure control to be optimised prior to pregnancy.

At the moment, sodium valproate (Epilim) appears to have greater risks than other AEDs, particularly when taken at more than 1000mg a day. Carbamazepine and lamotrigine have the lowest recorded risks, depending on dosage. Taking more than one drug, especially if it includes sodium valproate, increases the risk. Whatever medication you are taking, it is important to discuss this with your epilepsy specialist.

**Folic acid**

Folic acid (vitamin B9) helps a baby's spine to develop and has been shown to have a protective role in the prevention of neural tube defects. The Department of Health recommends that all women take 0.4mg folic acid supplement daily before becoming pregnant as well as throughout their pregnancy. Women with epilepsy are recommended to take a higher dose (5mg a day).

**Vitamin K**

Vitamin K plays a vital role in enabling our blood to thicken or clot. A very small number of babies (0.01%) are born with a vitamin K deficiency which may lead to nose or mouth bleeds or even internal bleeding. Vitamin K deficiency is more likely to occur in the offspring of women who have taken an enzyme-inducing AED during pregnancy. The Department of Health recommends that all babies are given 1mg vitamin K by injection at birth. This is standard practice for all babies.

**Pre-natal screening**

Pre-natal screening can help to determine the risk of a baby being born with birth defects, although even the most sophisticated of scans cannot detect 100% of abnormalities. Ultrasound scans are most usually carried out at 12 weeks (the dating scan) and 18–22 weeks to help give an early indication of major abnormalities. Blood tests may also help to indicate the risk of health disorders.

**Unplanned pregnancy**

If you find that you are unexpectedly pregnant it is important not to panic but to seek expert advice from your neurologist, epilepsy specialist nurse or GP. Abrupt withdrawal of AEDs is never advised and both you and your baby can be at risk from a sudden increase or reoccurrence of seizures.

**Management of labour**

Most women with epilepsy have normal deliveries and healthy babies. In general, they are not at any increased risk of obstetric complications and should be treated like any other pregnant women. Seizures during labour are uncommon. For 2–4% of women with epilepsy, the stress of labour – over breathing, sleep deprivation, pain, emotional stress and perhaps missed AEDs – may cause them to have a tonic clonic seizure during labour or during the 24 hours afterwards. This can happen even if a woman doesn't normally have tonic clonic seizures. A seizure may impair the baby's oxygen supply, so it is always recommended that women with epilepsy give birth in hospital. It is important to tell your midwife and medical team about your seizures and AEDs and to discuss pain relief well in advance. The analgesic pethidine has been thought to trigger seizures so is best avoided, but an epidural, breathing techniques and gas and air are all suitable.

**Post natal considerations**

Many women with epilepsy may experience breakthrough seizures in the first few weeks after birth. A post-natal review is always good practice as there may have been an alteration to medication that will need adjusting. This is also a good time to discuss breastfeeding which is safe and generally recommended.

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