

Pregnancy and fertility

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Although men who have CF can enjoy a normal sex life, they are almost always infertile due to an abnormality of the vas deferens (Kaplan et al, 1968). Sperms are produced, however, and it is possible to aspirate sperm from the epididymis and use this for *in-vitro* fertilisation. Success with this technique has been achieved recently and a number of pregnancies have occurred (Fogdestam et al, 1994; Schlegel, 1996), with a success rate of around 20% to 30% (Dohle et al, 1998). Historically, many young men with CF moved into adolescence without anyone counselling them about their almost certain infertility. We hope that this no longer happens and in the Leeds Unit the question of infertility in men with CF is now discussed with all our young teenagers by the CF Liaison Nurse before these boys pass from the paediatric to the transitional clinic. It is important that the issue is discussed frankly and sympathetically and that all boys are quite clear that all other aspects of sexual function are normal.

Women with CF have a thicker cervical mucus. This may make conception more difficult, because it is harder for the sperm to move through this mucus, but certainly not impossible. Women with CF therefore need advice about safe and effective contraception and the medium to high dose combined oral contraceptive pill is the method of choice. The question of contraception should be discussed as girls get ready to pass from the paediatric to the transitional clinic.

The first successful pregnancy in CF was reported in 1960 (Siegel & Siegal, 1960). Unfortunately the mother died six weeks after giving birth. The outlook has improved considerably since that time. An increasing number of women with CF are having babies (Cohen et al, 1980; Geddes, 1992; Edenborough et al, 1995). Eighteen infants, including one set of twins, have been born to women with CF attending our Adult CF Clinic at Seacroft - all are doing well. Women with CF should discuss their intention to become pregnant with the CF physician who will arrange referral for genetic and obstetric advice, and check that all the prescribed treatment is safe in pregnancy. Appropriate antenatal tests will be performed on the partner and patient to determine whether the partner is a carrier for CF. The pregnancy should be closely supervised by the CF team and an obstetrician familiar with the problems caused by CF in pregnancy. All pregnant ladies with CF in Leeds are cared for by the same consultant obstetrician. It is essential that the CF team and the obstetric team work closely together to optimise the time of delivery with regard to the demands of the baby and the mother's CF status. The CF team should be very flexible in organising care for pregnant women with cystic fibrosis. In Leeds we try and see patients approximately every two weeks. We generally work around the antenatal visits, seeing patients in our Unit either before or after their routine antenatal clinic visit so that they do not have to make separate visits to the hospital for antenatal and cystic fibrosis care. After delivery we encourage patients to come into the Unit for 1 - 2 weeks so that they can receive "top up" chest physiotherapy and intravenous antibiotics and have plenty of nursing help on hand for the new baby.

Women chronically infected with *Pseudomonas aeruginosa* are likely to need several courses of intravenous antibiotics during pregnancy. It is our policy to use ceftazidime and piperacillin, the former at a reduced dose of 2 grams three times a day. There is some evidence that the combination of these two agents may lead to resistance susceptibility but our options are limited. Other beta-lactams can be safely used. (We do not give probenidic during pregnancy). Although aminoglycosides have a potential for ototoxicity, they can be used safely but levels should be carefully monitored (Canny, 1993). Both chest and nutritional problems may require all the expertise of the combined medical and obstetric teams even though the patient may appear to have relatively mild CF at the start of the pregnancy. Studies of pregnancy in CF have shown a significant decline in respiratory function during the pregnancy with return to pre-pregnancy levels in the weeks following delivery of the baby (Edenborough et al, 1995; Jankelson et al, 1998). As expected, women with more severe respiratory disease are likely to have the worst outcome with a greater loss in respiratory function, a higher incidence of premature labour and more neonatal complications (Kent 1993; Edenborough et al, 1995; Jankelson et al, 1998). In a large American study Fitzsimmons found the rate of decline in FEV1 two years post pregnancy to be not significantly greater when mothers with cystic fibrosis were compared to matched controls. Across the board survival was worse in women with poor respiratory function and poor nutrition but pregnancy did not add any greater risk. The subgroup of women with diabetes mellitus requiring insulin may pose special problems (Fitzsimmons et al, 1996). Further data from the US Cystic Fibrosis Foundation database show that women with CF who become pregnant are as a group healthier at baseline than women who do not become pregnant. Even after adjusting for differences in various prognostic indices, pregnant women have longer survival than non-pregnant women. Overall the data show no decreased survival following pregnancy (Goss et al, 1999). Edenborough (1995) felt that an FEV1 below 60% predicted normal was a cut off point for a worse prognosis but it is difficult to predict

individual outcomes and we have seen maintenance of stable lung function throughout pregnancy in women with pre-conception FEV1 values of less than 40% predicted normal. Women with cystic fibrosis should have individual counselling about the suitability of pregnancy. Some of our patients have had an accelerated decline after giving birth and we feel this may be related to the support structure at home for the mother and new baby and the difficulties that the mother finds in caring for her own cystic fibrosis as well as attending to the demands of a new baby. We believe it is essential that the social worker of the Unit is intimately involved in establishing a care plan for mother and baby well in advance of delivery.

All women with CF who are planning to become pregnant should see a CF dietitian to optimise their nutritional status. A low pre-conceptional weight is a risk factor for poor pregnancy outcome. A survey of mothers with CF in the UK has shown that those who received nutritional advice before conceiving had significantly greater weight gain during pregnancy and gave birth to significantly heavier babies (Morton et al, 1996). Maternal health post-partum is directly related to nutritional status during pregnancy (Kent et al, 1993). They must also be given general advice, e.g., folic acid supplementation before conception to protect against neural tube defects (spina bifida) (Dept of Health, 1992).

Throughout pregnancy regular monitoring of nutritional status is essential. Oral supplementation or nasogastric feeding may be required. Pregnancy may affect glucose tolerance and the blood glucose should be monitored. An oral glucose tolerance test is performed in the second trimester.

Successful breast feeding in mothers who have CF has been achieved (Michel et al, 1994). Breast milk from women with CF has been shown to have normal sodium and protein levels and the lipid levels are sufficient for the nursing needs of the infant. However, pregnancy exerts a nutritional strain on the mother which will be intensified by breast feeding. Every mother who has CF should be considered individually according to her clinical condition and circumstances when advice about infant feeding is given.

Successful pregnancies have been reported in women following transplant (Scott et al 1993; Parry et al 1996). Cyclosporin is not teratogenic in animals but there are only limited data in humans. Azathioprine is teratogenic in animals but has not been shown to cause an increased incidence of congenital abnormalities in humans. For both drugs there are insufficient data to conclude that they are safe or unsafe to use during pregnancy but the suggestion from the reports available is that neither drug is teratogenic. There is thought to be an increased risk of rejection of the transplanted lungs with pregnancy in the first two to three years after surgery. We believe that all women with CF who have received successful transplants and who wish to become pregnant should discuss this with their transplant centre physicians and follow advice given.

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