Cystic fibrosis during pregnancy

**ABSTRACT**

**QUESTION** I have a 23-year-old patient with cystic fibrosis (CF) who recently married and has come to see me regarding preconception counseling and prospects of pregnancy. According to my sources, patients with CF can have successful pregnancies. How should I advise my patient?

**ANSWER** Cystic fibrosis in all degrees of severity is not a strict contraindication for pregnancy, especially if disease is mild; pregnancy by itself does not appear to adversely affect patients with CF. Pregnancy could proceed normally in women with normal lung function, but could adversely affect mild and moderate lung disease due to CF and should be avoided when patients have pulmonary hypertension or cor pulmonale, and when reduced lung function is predicted. Ideally, all pregnancies should be planned with prior counseling and be monitored by dedicated CF teams.

**RÉSUMÉ**

**QUESTION** Une de mes patientes de 23 ans souffrant de fibrose kystique (FK) vient de se marier et elle est venue me consulter concernant la préconception et la perspective d'une grossesse. Selon mes sources d'information, les patientes atteintes de FK peuvent très bien mener une grossesse à terme. Quels conseils devrais-je donner à ma patiente?

**RÉPONSE** La fibrose kystique, qu’importe le degré de gravité, n’est pas strictement une contre-indication à la grossesse, en particulier si l’affection est bénigne; la grossesse ne semble pas en elle-même affecter les patientes souffrant de FK. La grossesse pourrait se dérouler normalement chez les femmes ayant une fonction pulmonaire normale. Par ailleurs, elle pourrait affecter des maladies pulmonaires bénignes et modérées dues à la FK et elle devrait être évitée chez les patientes souffrant d’hypertension pulmonaire ou d’un cœur pulmonaire et si l’on prévoit une fonction pulmonaire réduite. Idéalement, toutes les grossesses devraient être planifiées à la suite d’un counseling préalable et devraient être suivies par des équipes spécialisées en FK.

Researchers estimate that close to half of all CF patients in Canada today are adults. This increase in survival is largely attributable to earlier diagnosis and intervention and to advances in antibiotic therapy and nutritional support. Knowledge of the specifics of CF and the physiologic changes of pregnancy is important in managing patients with CF.1-3 Pregnancy might be complicated if patients with CF have pulmonary hypertension, cor pulmonale, or an FEV₁ (forced expiratory volume in 1 second) below 50%

Many antibiotics have been shown to be safe during pregnancy and breastfeeding and can be used by patients with CF as required. Generally, gestation age has to be considered in choosing antibiotics, and dosage might need to be adjusted for a changed volume of distribution and clearance rate during pregnancy.4

**How pregnancy and CF interact**

No evidence indicates that pregnancy has an adverse effect on patients with stable CF, but patients with more advanced disease can have poor outcomes. Mothers with FEV₁ above 80% and no *Burkholderia cepacia* infection have better outcomes, fewer operative and instrumental deliveries, fewer preterm infants, and fewer neonatal complications than mothers with more serious disease.

Do you have questions about the safety of drugs, chemicals, radiation, or infections in women who are pregnant or breastfeeding? We invite you to submit them to the Motherisk Program by fax at (416) 813-7562; they will be addressed in future Motherisk Updates. Published Motherisk Updates are available on the College of Family Physicians of Canada website [www.cfpc.ca](http://www.cfpc.ca). Some articles are published in *The Motherisk Newsletter* and on the Motherisk website [www.motherisk.org](http://www.motherisk.org) also.

*Motherisk questions are prepared by the Motherisk Team at the Hospital for Sick Children in Toronto, Ont. Dr Liaschko was a member and Dr Koren is Director of the Motherisk Program and a Senior Scientist in the Canadian Institutes of Health Research.*
Pregnancy might still be complicated, however, by pulmonary hypertension, cor pulmonale, and a predicted FEV₁ below 50%. Pregnancy does not appear to affect the rate of early decline of FEV₁.

It is important to closely follow gastrointestinal manifestations of the disease, such as malabsorption, gut motility disorder, diabetes mellitus, and hepatic and biliary disease. Due to the additional nutritional demands of the fetoplacental unit, patients who already have malabsorption are at increased risk of emaciation during pregnancy.

Apart from these problems, no evidence indicates that pregnancy increases morbidity and mortality from CF. It has been suggested that rapid deterioration in clinical status, especially pulmonary function, affects the prognosis for mother and infant more than chronically impaired status at the onset of pregnancy.

When adjusted for the same parameters, pregnant CF patients have the same survival rates as the entire population of female patients with CF. It should be kept in mind, however, that when patients become pregnant, their general care often improves. They are likely to be more closely supervised by their physicians and to be more aware of their own health.

There is no evidence that CF severity is associated with increased risk of fetal malformations. Rates of preterm delivery have been reported to vary from 5.9% to 35%. This puts infants born to CF patients at increased risk of inadequate maternal nutrition; poor infant weight gain might also be associated with maternal pancreatic insufficiency and malabsorption. Patients with CF usually have a low mean weight gain during pregnancy, on average 5 to 7 kg.

Genetic counseling
It is important that young people with CF be given adequate genetic counseling on the risk of their babies having CF. After having one child with CF, and faced with a 25% risk of having another child affected with CF, many couples hesitate to procreate. All presumptive fathers, where appropriate, should be genotyped (approximately one in every 25 Canadians is a carrier of the gene). The final decision on whether or not to attempt pregnancy should always be made by an informed couple.

Mass screening of newborn infants for CF is not currently recommended, as it has no proven clinical and financial benefits. Today, in Canada, laboratory tests can detect about 85% of CF carriers, and more than 90% in certain populations and ethnic groups.

Because numerous mutations (more than 500 to date) account for the clinical manifestations of CF, reliable tests for the heterozygote are not yet available. The most common mutation, ΔF508, combined with the next nine most common mutations, collectively account for about 78% of all mutations; other known mutations individually account for only a fraction of 1%. Therefore, diagnosis in the first trimester is possible for at least two thirds of couples presenting with one affected child. This might have a bearing on a family’s decision to continue or terminate pregnancy.

Management considerations
Most adults with CF are aware of their shortened life expectancy and the implications of this for parenting. Such issues as long-term plans for children if the mother dies should be addressed. Patients who continue pregnancy require optimal medical care of their respiratory health. They should continue physiotherapy and use antimicrobials shown to be safe during pregnancy as needed. Penicillin, cyclosporines, and aminoglycosides are safe. Quinolones have not been shown to increase teratogenic risk. Tetracycline should be avoided due to its adverse effect on developing teeth.

Nearly all β-adrenergic agonists can be used safely during pregnancy. Exacerbation of respiratory infection or malnutrition should be recognized promptly and treated immediately. Malnutrition, along with maternal hypoxemia, should be closely monitored because both can lead to intrauterine growth deficiency, a frequent complication of CF. Malnutrition and maternal hypoxemia are the most frequent causes of preterm delivery. Ideally, all pregnancies should be monitored by dedicated CF teams that include obstetricians experienced in managing high-risk pregnancies.

Vaginal delivery is preferred for these patients using epidural rather than opiate analgesia or general anesthesia, which might compromise respiratory status. Forceps or vacuum delivery should be considered early in the second stage of labour to avoid or relieve maternal exhaustion.

If maternal nutrition is adequate, breastfeeding should be encouraged. Bottle-feeding might be advised for patients whose general health is poor. An earlier belief that women with CF have a very high sodium content in their breast milk has not been verified. The breast milk of mothers with CF has a slightly lower fat content, specifically lower levels of essential fatty acids. Most medications needed for treatment of CF are safe to take during breastfeeding.

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References
1. Frangolias DD, Nakielna EM, Wilcox PG. Pregnancy

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