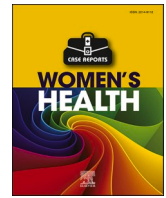




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Invited Editorial

Post-COVID-19 condition and pregnancy



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Post-COVID-19 condition (PCC), also known as long COVID, is an increasingly recognised complication of COVID-19 infection. The UK National Institute for Health and Care Excellence (NICE) defines PCC as 'Signs and symptoms that develop during or after an infection consistent with COVID-19, continue for more than 12 weeks and are not explained by an alternative diagnosis' [1]. It is estimated that 2–13% of people experience prolonged symptoms following COVID-19 infection and it is currently unknown whether pregnancy affects the risk of developing PCC [2,3]. There are currently no approved treatments. The diagnosis and management of PCC are challenging, more so during pregnancy. However, our knowledge of COVID-19 and PCC continues to evolve. The recent introduction of a diagnostic test for PCC [4] with a reported 90% accuracy across all COVID-19 strains is likely to improve management outside pregnancy. However, the performance of this test in pregnant women is unknown.

PCC is a multisystem disorder which presents significant diagnostic challenges as many of the 200 symptoms [5,6] associated with the disorder can easily be mistaken for other common conditions. The SARS-CoV-2 entry receptor ACE2 is expressed in multiple tissues and so the manifestation of multi-organ dysfunction is unsurprising [7]. The most common symptoms of PCC are fatigue, shortness of breath and cognitive impairment or 'brain-fog' [5] – symptoms that are commonly reported by women during normal pregnancy. The clinical manifestation of PCC can fluctuate over time, adding to the management challenge [3]. Clinical examination and routine investigations may be normal. The risk of developing PCC does not seem to be linked to the severity of the acute COVID-19 infection or the need for inpatient hospital care [1]. Furthermore, pregnancy does not appear to increase the risk of developing PCC [3]. A recent UK study involving over 28,000 patients showed a 12.8% reduction in the odds of developing PCC after one vaccination and a further 8.8% decrease after a second dose. Vaccination may therefore contribute to a reduction in the population health burden of PCC [6] and should be encouraged during pregnancy.

The key components of the care of pregnant women with PCC are the

same as for non-pregnant individuals: self-management and medical management. Self-management includes daily pulse oximetry, and optimising general health with sleep, diet, smoking cessation and limiting alcohol and caffeine intake. A gradual increase in exercise should be encouraged, if tolerated. These should be combined with a realistic set of goals [8]. Medical management strategies include symptomatic treatments, optimising control of pre-existing medical conditions, antibiotics for secondary infection, referral to other specialities such as mental health services and pulmonary rehabilitation [1,8]. The value of financial and social support should not be ignored.

The care of pregnant women with PCC poses additional challenges. Consequently, women with symptoms suggestive of PCC should have the diagnosis confirmed and their health optimised before embarking on a pregnancy. Women with severe symptoms should be referred for pre-conception counselling. The effects of pregnancy on PCC are unknown at present. Given the overlap with symptoms of normal pregnancy, women with fatigue and breathlessness can expect a deterioration during pregnancy, especially in the third trimester. During the antenatal period, use of a symptom diary may allow early identification of new symptoms or deterioration. A prior diagnosis of PCC does not obviate the development of a new medical or pregnancy-related disorder. New or deteriorating symptoms should therefore prompt a detailed assessment before being ascribed to pre-existing PCC. Serial ultrasound fetal growth monitoring should be considered in women with severe symptoms. The timing of birth and intra-partum care should be individualised especially in women with severe fatigue, respiratory or cardiovascular symptoms. Caesarean section should be reserved for obstetric indications.

The initial weeks following childbirth can be demanding for any new mother and PCC can be expected to pose additional challenges. The physiological changes that occur following childbirth may lead to a change in the nature and severity of the key symptoms – fatigue, breathlessness, and brain-fog. In line with care during the antenatal period, new or deteriorating symptoms should be fully evaluated before being ascribed to PCC. Additional support from family, friends and

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healthcare professionals is paramount.

Women with PCC and their clinicians face a number of key challenges during pregnancy: confirming the diagnosis of PCC (which may be facilitated by advances in diagnostic testing); excluding new-onset disorders as symptoms evolve through pregnancy and the post-partum period; and developing specific individualised interventions that evolve with the pregnancy. Care should be multi-disciplinary and include non-medical and social interventions. Women should be empowered to self-care and set attainable goals. New diagnostic and therapeutic strategies should be evaluated during pregnancy where possible to optimise care and ensure that pregnancy outcomes are not compromised by PCC and the course of PCC is not adversely affected by pregnancy. Knowledge of COVID-19 and PCC continues to improve, and clinical care should evolve to reflect this.

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