

# An Interesting Case of Bell's Palsy in Pregnancy Associated with COVID-19 Infection

DISKET DOLKAR<sup>1</sup>, VINIKA NIMODIA<sup>2</sup>

## ABSTRACT

Recent studies have reported that Coronavirus Disease-2019 (COVID-19) can be the cause of peripheral facial paralysis and neurological symptoms may be the only manifestation of the disease. Hereby, the authors present an interesting case of a pregnant COVID-19 positive female with Bell's palsy, in third trimester of pregnancy. A 33-year-old female, G3P0L0A2, presented with left-side deviation of angle of mouth, excessive lacrimation and redness of right eye for the past three days. She had involuntary drooling on right and left side labial commissural deviation, absence of forehead frowning, inability to close her right eye (positive Bell's phenomena), and ipsilateral lagophthalmos. No lesions were seen on the external ear and otoscopy was normal. She was confirmed to have right-sided facial nerve palsy. She had an uneventful course of pregnancy till term and underwent caesarean section at 40 weeks, in view of foetal distress. Pregnancy and Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection, both are immunocompromised state, and hence, could be a risk factor for Bell's palsy. But larger studies with more cases are required to prove the causal association.

**Keywords:** Coronavirus disease 2019, Facial nerve, Forehead frowning, Ipsilateral lagophthalmos

## CASE REPORT

A 33-year-old female, G3P0L0A2 at 33 weeks of gestation, visited the Obstetric Department with history of left-sided deviation of the angle of mouth, excessive lacrimation, and redness of right eye since three days. She was not on any medication for these co-morbidities. There was no history of fever, skin rash, dermatomal pain, ear discharge, earache, cough, shortness of breath, myalgias, arthralgias, anosmia, ageusia, tick bite, or trauma. There was no history of diabetes, hypertension, thyroid or any other autoimmune disease.

On examination, the patient was afebrile, pulse 86/minute, blood pressure was 120/70 mmHg, SpO<sub>2</sub>=96%; chest and cardiovascular examinations were unremarkable. Abdominal examination showed gravid uterus of size corresponding to 32-34 weeks of gestation, and foetus in cephalic presentation with regular foetal heart rate of 145/minute. On neurological examination, higher motor functions were intact. She had involuntary drooling on right and left side labial commissural deviation, absence of forehead frowning, inability to close right eye (positive Bell's phenomena) and ipsilateral lagophthalmos. Otolaryngological examinations did not reveal any lesions in the external ear and otoscopy was normal. She was confirmed to have right-sided facial nerve palsy. Laboratory results (complete blood count, oral glucose tolerance test, viral markers, liver enzymes) revealed no abnormality. Computed Tomography (CT) head was planned, but patient could not afford it. As per the screening protocol of the hospital, prior to admission, SARS-CoV-2 rapid antigen test was done and she tested positive for the same. She was immediately isolated and shifted to the COVID-19 care centre.

She was started on a 10 day tapering dose of corticosteroid therapy (prednisolone starting at 1 mg/kg/day), for facial nerve palsy. Proper eye care measures were undertaken with hydrating eye drops and eye patch. She was also started on facial physiotherapy exercises. At 10 days follow-up, the patient was able to spontaneously close her eyes, and there was marked improvement in lacrimation, gradual improvement in the angle of mouth deviation. There was a marked improvement in overall facial weakness at four weeks. Repeat Reverse Transcription-Polymerase Chain Reaction (RT-PCR) done after 10 days of positive report was negative, and her symptoms

also resolved. She had an uneventful course of pregnancy till term, and underwent a caesarean section at 40 weeks in view of foetal distress. The baby weighed 2820 gm and had a 5 minute "Appearance, Pulse, Grimace, Activity, and Respiration" (APGAR) score of 8/10. The baby was tested for COVID-19 and was found to be negative. Follow-up was done till six months, and there was a significant improvement in the overall facial symptoms of the new mother.

## DISCUSSION

The incidence of Bell's palsy is 15 to 30 per 100,000 persons annually. It more commonly occurs in pregnant women and the patients suffering with diabetes [1]. Bell's palsy is an idiopathic peripheral nerve palsy involving mainly the facial nerve. The aetiology of Bell's palsy is unknown but literature says that viral infection and autoimmune disease are the possible causes [1]. Respiratory symptoms are the main clinical features of COVID-19 infection. Studies have shown that COVID-19 may be a possible cause of peripheral facial nerve paralysis and also neurological symptoms can be the only presentation of COVID-19 [2].

A retrospective study, reported 36.5% of COVID-19 patients to have neurological symptoms and hence, it was presumed that SARS-CoV-2 might also have some neurotropism [3]. The incidence of Bell's palsy is seen more commonly in pregnant women [1,4] due to the physiological changes of pregnancy, like hypercoagulable state, hypervolemia, immunosuppression, and hormonal changes. Also, conditions like hypertension, preeclampsia, and gestational diabetes mellitus might increase the risk [4]. In Bell's palsy and Guillain-Barré syndrome, a viral infection like herpes simplex, herpes zoster may provoke an autoimmune reaction against peripheral nerve myelin components, that may lead to the demyelination of cranial nerves, especially the facial nerve [1]. Viral cellular tropism in COVID-19 in humans is assessed by Angiotensin Converting Enzyme 2 (ACE2) receptors in tissues. ACE2 inhibitors are located on lung epithelia but also on endothelial cells of the blood-brain barrier. Virus binds at this receptor, and hence, allows entry into the central nervous system [5].

In a recent report, a pregnant patient with term gestation was diagnosed with COVID-19 and presented with Bell's palsy. The authors hypothesised that COVID-19 may be a cause of peripheral facial paralysis. Also, neurological symptoms might be the only manifestation of the disease [2]. Another case reported Bell's palsy in a symptomatic COVID-19 non pregnant patient. The patient was diagnosed with Bell's palsy but negative for herpes zoster. Therefore, it was concluded that SARS-CoV-2 infection can be associated with Bell's palsy [6].

In the present case report, the pregnant women, in her third trimester of pregnancy, presented with a 3-day history of unilateral facial paralysis and was diagnosed with COVID-19. She had not taken the COVID-19 vaccine. She was initiated on a tapering course of corticosteroids and her follow-up visit at 10 days, four weeks and six months showed marked improvement in her facial weakness. Also, her facial muscle tone improved with the help of facial exercises. Fortunately, there was no effect of the palsy on her pregnancy and baby. Other causes of acquired facial paralysis were excluded, as there were no history suggesting any infection, diabetes, hypertension, and other systemic disease. Hence, the only positive association with facial paralysis was the positive SARS-CoV-2 rapid antigen test.

## CONCLUSION(S)

Facial nerve paralysis may be caused by SARS-CoV-2 infection, but pregnancy, being an immunocompromised state, is a risk factor for Bell's palsy. However, there is no clear relation between pregnancy and Bell's palsy. COVID-19 in pregnancy is a predisposition for Bell's palsy.

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### PARTICULARS OF CONTRIBUTORS:

1. Senior Resident, Department of Obstetrics and Gynaecology, Dr. Ram Manohar Lohia Hospital, New Delhi, India.
2. Senior Resident, Department of Obstetrics and Gynaecology, Dr. Ram Manohar Lohia Hospital, New Delhi, India.

### NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Vinika Nimodia,  
Senior Resident, Department of Obstetrics and Gynaecology, Dr. Ram Manohar Lohia Hospital, New Delhi, India.  
E-mail: drvinika146@gmail.com

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