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### RESEARCH ARTICLE

#### PREGNANCY INDUCED BELL'S PALSYP: AN IN DEPTH EXAMINATION OF THERAPEUTIC MODALITIES AND ADJUNCTIVE MEASURES

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#### Abstract

**Background:** Bell's palsy, a unilateral facial nerve paralysis, often presents challenges in diagnosis and management, especially when occurring during pregnancy and associated with preeclampsia. This case report aims to delineate the clinical manifestation, therapeutic interventions and outcome of preeclampsia-induced Bell's palsy during pregnancy, emphasizing the importance of multidisciplinary care and post natal follow-up.

**Case Description:** A 29-year-old gravid individual at 40 weeks of gestation presented with right sided facial weakness and hypertension, diagnosed with preeclampsia-induced Bell's palsy. Treatment included antihypertensive medications, corticosteroids and close monitoring. Labor induction resulted in a healthy deliver, with satisfactory outcomes for both mother and baby.

**Conclusion:** Early recognition, prompt treatment initiation and multidisciplinary management are essential in optimizing maternal and fetal outcomes in pregnant individuals with Bell's palsy. Continued research efforts are needed to refine therapeutic approaches and improve care. This case underscores the importance of interdisciplinary care and vigilance in pregnant individuals with Bell's palsy, highlighting the need for further research to optimize management strategies in this unique population.

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#### Introduction:-

Bell's palsy, an enigmatic neurological disorder, bears the eponymous epithet of Sir Charles Bell, manifesting as an acute unilateral facial nerve paralysis characterized by abrupt onset and varying degrees of facial muscle weakness or paralysis. It stands as the preeminent etiology of facial nerve palsy, prevailing across diverse demographic spectra with an annual incidence ranging from 11.5 to 53.3 per 100,000 individuals<sup>[1]</sup>. Noteworthy within the obstetric realm is its intricate liaison with gestational physiology, notably preeclampsia, imparting a distinctive clinical pertinence. The convoluted pathogenesis of this malady, marked by multifactorial influences, remains a subject of ongoing scrutiny, confounded by the complexity of differential diagnostic considerations and the elusive nature of its exact precipitants<sup>[2]</sup>. Historical antecedents, tracing back to Avicenna's ancient observations and antedating Charles Bell's seminal elucidations, bespeak the enduring intrigue surrounding this affliction. Despite advancements

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in diagnostic modalities and therapeutic interventions, management of Bell's palsy continues to pose formidable challenges, accentuated by its potential sequelae<sup>[3]</sup>. This case report delineates the clinical manifestation, therapeutic interventions, and resultant outcome of Bell's palsy precipitated by preeclampsia in gravid state, underscoring the imperative of interdisciplinary collaborations and meticulous postpartum surveillance to optimize maternal and fetal welfare. Its objective lies in furnishing nuanced understanding regarding the pathophysiological trajectory and tailored therapeutic modalities pertinent to this unique clinical scenario in pregnant cohorts. It aims to provide insights into clinical course and therapeutic approaches for this condition in pregnant individuals.

### Review

Preeclampsia, along with its associated hypertensive disorders of pregnancy, represents a significant concern in maternal healthcare, affecting up to 10% of pregnancies in the USA. It contributes substantially to maternal mortality rates, accounting for 6.9% in the USA and 14% worldwide. Notably, neurological complications are leading cause of death in women with preeclampsia, with conditions such as intracerebral hemorrhage or cerebral edema being responsible for 30-70% of these deaths.

Despite the severity of these neurological manifestations, they are often overlooked in pregnant and postpartum women. Autopsy findings and case series have underscored the preventable nature of many maternal deaths related to preeclampsia, with earlier recognition, diagnosis and treatment being crucial in improving outcomes.

The bell's phenomenon is crucial for assessing facial paralysis. In healthy individuals can be tightly shut but when the facial nerve is affected, only the unaffected eye can fully close while the paralyzed eye remains partially open, increasing vulnerability to injury. This reflex involves the upward and outward rolling of the eyes when forcibly closed. Peripheral facial nerve palsy is characterized by forehead immobility, drooping eyebrows, incomplete eyelid closure, and mouth drooping and reduced nasolabial fold prominence. Distinguishing between peripheral and central facial palsy, especially with predominantly perioral involvement, can pose diagnostic challenges

The recognition of neurological symptoms, particularly severe headaches, as potential indicators of preeclampsia has gained prominence within the obstetric community. While headache alone may not be a definitive diagnostic criterion, when coupled with other features such as new-onset hypertension after 20 weeks of gestation, it becomes significant in diagnosing preeclampsia. Neurological symptoms like severe headache, altered mental status, eclamptic seizures, stroke, visual disturbances or cortical blindness are now acknowledged as important markers of the condition.<sup>[4]</sup>

### Bell's palsy in Pregnancy:

Bell's palsy is characterized by temporary facial paralysis or weakness, is known to occur more frequently during pregnancy, especially in the third trimester and immediate postpartum period<sup>[5]</sup>. The exact etiology of Bell's palsy remains uncertain, with viral reactivation within the facial nerve ganglion, inflammation within the temporal bone, and subsequent ischemic insults being among the favoured theories. Pregnancy related factors such as fluid retention, hormonal changes, immunosuppression and hypercoagulability may predispose women to develop Bell's palsy during gestation<sup>[6]</sup>.

Studies have indicated an increased incidence of Bell's palsy in pregnant women with hypertensive disorder such as preeclampsia. This association may be attributed to exacerbated physiological changes, including significant edema and hypercoagulability, observed in preeclamptic pregnancies. Moreover, obesity, chronic hypertension and preeclampsia have been identified as independent risk factor for Bell's palsy during pregnancy<sup>[7]</sup>.

### Management of Bell's palsy in Pregnancy:

The treatment of Bell's palsy during pregnancy poses challenges due to concerns about potential adverse effects on fetus. While corticosteroids particularly prednisolone is often recommended as the mainstay of treatment, there is ongoing debate regarding the use of antiviral agents in conjunction with corticosteroids. Some evidence suggests potential synergistic effects when antivirals are combined with corticosteroids, particularly in severe cases of Bell's palsy.

Clinical guidelines recommend prompt initiation of steroids treatment within 72 hours of symptoms onset, with higher doses (>450 mg) associated with better outcomes. Surgical decompression of the facial nerve may be considered in select cases, although evidence supporting its efficacy in pregnancy is limited.

Despite the challenges, Bell's palsy in pregnancy generally responds well to treatment, with the majority of case experiencing full recovery. Early initiation of therapy and close monitoring are essential to optimize outcomes and minimize the risk of complications for both the mother and the fetus <sup>[7, 8]</sup>.

### **Case Description**

#### **History of Present Illness:**

A 29-year old gravid 2 Para 2 living 1 with 9 months of pregnancy presented with complaints of right side facial weakness and deviation of the right angle of the mouth. She reported no preceding trauma or viral illnesses. Local examination revealed a deviation of the right angle of mouth, with preservation of the nasolabial fold on the left side of the face and Bell's phenomenon in the left eye.

#### **Neurological Examinations:**

On neurological examination, the patient exhibited weakness of the right facial muscles consistent with Bell's palsy. The deviation of the right angle of the mouth, preservation of the nasolabial fold on the left side and Bell's phenomenon in the left eye indicated involvement of the right facial nerve (cranial nerve VII). The patient's blood pressure was measured at 150/100 mm Hg, indicating hypertension. In the context of her pregnancy and elevated blood pressure, preeclampsia-induced Bell's palsy was considered.

#### **Gynecological Assessment:**

The patient's blood pressure (150/100 mm Hg), indicated hypertension. She had proteinuria on urinalysis, suggestive of preeclampsia. Given her gestational age of 40 weeks and the presence of preeclampsia, the diagnosis of preeclampsia induced Bell's palsy was made.

#### **Management and Treatment**

The patient was started on antihypertensive medication to control her blood pressure and prevent complications of preeclampsia. Additionally, oral prednisolone (OMNACORTIL 20 mg) was prescribed to reduce inflammation and swelling of the facial nerve associated with Bell's palsy. Close monitoring of both neurological symptoms and the pregnancy was planned.

#### **Obstetric History and Physical Examinations**

The patient conceived spontaneously and had regular antenatal care visits. No history of exposure to radiation or teratogenic drugs was reported. Fetal movements were appreciated regularly, and all ultrasound scans were normal. The patient had a known case of hypothyroidism and was diagnosed with Bell's palsy one week prior to admission. On examination, she had a gravid uterus consistent with 40 weeks of gestation.

Hemoglobin, platelet count and liver function tests were within normal limits. Thyroid function tests were consistent with hypothyroidism, and the patient was on treatment Tab. Thyronorm 50 mcg.

Ultrasound scan showed a singleton live vertex presentation fetus at 37-38 weeks of gestation with normal parameters.

One week after the diagnosis of Bell's palsy the patient was admitted for safe confinement. Induction of labor was initiated with oral Misoprostol, and vaginal delivery was conducted without complications. A healthy male infant weighing 3.45 kg was delivered with Apgar scores of 9/10 at 1 minute and 10/10 at 5 minutes. Post partum care was provided, and the patient was started on antibiotic therapy.

#### **Treatment Given:**

The patient was treated with Omnacortil for Bell's palsy, Thyronorm for hypothyroidism and Labetalol as a pregnancy safe antihypertensive to control her blood pressure. Pain management and wound care were provided as per protocol.

This case highlight the management of preeclampsia-induced Bell's palsy in the setting of pregnancy, emphasizing the importance multidisciplinary care and close monitoring during the antenatal and post natal periods.

**Discussion:-**

Bell's palsy, a condition characterized by acute unilateral facial paralysis, presents unique challenges when encountered in pregnant population, particularly when associated with preeclampsia. While the pathogenesis of Bell's palsy remains multifactorial and poorly understood, its occurrence during pregnancy may be attributed to a combination of hormonal changes, immune modulations and vascular factors. Pregnancy-induced alterations in immune function and fluid dynamics, coupled with hypercoagulable state associated with preeclampsia, may predispose pregnant women to facial dysfunction.

The relationship between Bell's palsy and preeclampsia is complex and not fully elucidated. While some studies suggest an increased incidence of Bell's palsy in pregnant women with hypertensive disorder, including preeclampsia, others have failed to establish a significant association. The variability in findings underscores the need for further research to clarify the underlying mechanisms and identify potential risk factors<sup>[4,5]</sup>.

Management of Bell's palsy in pregnancy requires careful considerations of both maternal and fetal well being. Corticosteroids, the mainstay of treatment are effective in reducing inflammation and accelerating recovery. However, their use during pregnancy necessitates caution due to potential fetal adverse effects, emphasizing the importance of weighing the risks and benefits of case-by-case basis. The timing of corticosteroid initiation is crucial, with early intervention within 72 hours of symptom onset associated with better outcomes. The role of antiviral agents in conjunction with corticosteroids remains controversial, with limited evidence supporting their efficacy in improving outcomes<sup>[7, 8]</sup>.

The presented case report highlights the challenges and complexities of managing Bell's palsy in the context of pregnancy and preeclampsia. The sequential development of Bell's palsy followed by preeclampsia underscores the need for comprehensive clinical evaluation and interdisciplinary collaboration. While the patient in this case experienced a favorable outcome with timely intervention and close monitoring, further research is warranted to enhance our understanding of the pathophysiology and optimize therapeutic strategies for pregnant individuals with Bell's palsy.

**Conclusion:-**

Bell's palsy occurring in the setting of pregnancy, particularly in association with preeclampsia, presents intricate clinical and therapeutic considerations. While the exact mechanisms linking these conditions remain incompletely understood, early recognition, prompt treatment initiation and multidisciplinary management are essential in optimizing maternal and fetal outcomes. Continued efforts are needed to elucidate the underlying pathophysiology and refine therapeutic approaches, ultimately improving the care and prognosis of pregnant individuals with Bell's palsy.

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