

# Insights into pregnancy-related Bell's palsy

## Abstract

Physiological changes during normal pregnancy may contribute to the clinical onset of a variety of pregnancy-related complications. In the third trimester of pregnancy or in the first week postpartum, there is a higher risk of viral reactivation, as well as much more frequent pregnancy complications, such as hypertensive disorders and gestational diabetes. Considerably higher than in nonpregnant population, Bell's palsy or the idiopathic peripheral facial palsy has a higher rate in pregnancy, especially in the third trimester or postpartum. The condition usually resolves spontaneously or with minimal treatment, although in some cases it may require a complex management. Further studies that compare treatment dosage, therapeutic agents and time of recovery when treating Bell's palsy are needed to update the currently management.

**Keywords:** Bell's palsy, pregnancy complications, preeclampsia

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## Noutăți privind paralizia facială Bell din timpul sarcinii

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The physiological changes during normal pregnancy may contribute to the clinical onset of a variety of pregnancy-related complications. It has been demonstrated that the mechanism involved in immunosuppression during pregnancy may determine an increased level of cortisol which is responsible for a higher risk of viral reactivation<sup>(1)</sup>.

In the third trimester of pregnancy or in the first week postpartum, there is a higher risk of viral reactivation, such as of herpes simplex virus, compared to the rest of the pregnancy, due to an alteration in the immune pathway of normal viral reposes by changing the T and B lymphocytes subpopulations (CD3+, CD4+ and CD8+) and macrophages proportion<sup>(2)</sup>. Inflammation mechanisms are highly activated, resulting specific immune mediators, such as IL-6, IL-8 and TNF- $\alpha$ , that increase the chance of dormant viruses' reactivation<sup>(3)</sup>. In response to inflammatory processes, fluid retention, perineural oedema and thrombosis of the *vasa nervorum*, an ischemic facial neuropathy appears by the reactivation of latent herpes simplex virus infection in the geniculate ganglions of facial nerves. This mechanism has been associated with the most common acute unilateral peripheral facial paralysis, also known as Bell's palsy or idiopathic peripheral facial palsy<sup>(4)</sup>. However, the definite etiology and pathogenesis of Bell's palsy remain unclear.

## Rezumat

Modificările fiziologice din cursul sarcinii normale contribuie la debutul a diverse complicații asociate sarcinii. În trimestrul al treilea al sarcinii sau în prima săptămână post-partum există un risc mare de reactivare virală, precum și de apariție mult mai frecventă a unor complicații asociate sarcinii, cum ar fi hipertensiunea arterială și diabetul zaharat. Considerabil mai frecventă la femeile negravidă, paralizia Bell, sau paralizia facială periferică idiopatică, are o frecvență ridicată și în sarcină, în special în trimestrul al treilea sau post-partum. Afecțiunea se rezolvă spontan sau cu un tratament minim, deși în unele cazuri necesită un tratament complex. Studiul viitoare, care să compare doze, agenți terapeutici și timpul de recuperare în tratamentul paraliziei Bell, sunt necesare pentru a aduce la zi conduita curentă.

**Cuvinte-cheie:** paralizia Bell, complicații în sarcină, preeclampsie

This association is also called Mona Lisa syndrome. It is suspected that Gioconda's famous smile was caused by a contraction of the facial muscles that appeared as a result of a paresis of the facial nerve, with incomplete recovery. It is said that Mona Lisa was pregnant when Leonardo da Vinci took her as a model for her famous painting<sup>(5)</sup>.

Considerably higher than in non-pregnant population, with an estimated prevalence of 45.1 cases per 100,000 women<sup>(6)</sup>, Bell's palsy carries the name of Sir Charles Bell, who described firstly in 1830 the association of facial palsy and pregnancy<sup>(7)</sup>. The clinical manifestations of Bell's palsy include acute onset and usually unilateral facial palsy (normally isolated VII<sup>th</sup> nerve) with difficulties on the affected side of raising the brow, closing the eye, pouting the lips, smiling and, by definition, involving the forehead. Other autoimmune conditions (sarcoidosis) and infectious causes (Lyme disease), tumors, facial/temporal bone fracture or otitis media may determine atypical clinical features associated with the facial palsy, such as retroauricular and mastoid pain, unilateral weakness and numbness of lips, loss of taste, diplopia, loss of vision changes in hearing and rashes. The symptoms are usually sparing the forehead and other nerves may be involved, requiring full neurological examination<sup>(8)</sup>.

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Recent observational studies have demonstrated a higher rate of pregnant women diagnosed with Bell's palsy and other pregnancy complications such as hypertensive disorders and gestational diabetes. There is a 3.3 times increased risk of facial nerve paresis in pregnant women, especially in the third trimester of pregnancy<sup>(5)</sup>. It is considered that the alteration in physiological changes of the levels of estrogen and progesterone, impaired glucose tolerance, increased total body water that contribute to hypertension and preeclampsia and gestational diabetes increase the likelihood of idiopathic facial palsy due to ischemic facial neuropathy complicated with long-standing systemic hypertension, glucose intolerance or diabetes mellitus<sup>(9)</sup>. The study of Shmorgun et al. showed that the majority of women who developed Bell's palsy in pregnancy had no diabetes mellitus or chronic hypertension before pregnancy and more pregnant women developed preeclampsia than gestational hypertension, suggesting that there is a common pathway in this association<sup>(10)</sup>.

The case-control study recently published by the team of Leelawai et al.<sup>(4)</sup> assessed if neonatal outcomes are significantly influenced by the presence of Bell's palsy during pregnancy and the results showed that there were no significant differences in gestational age at birth regarding body length, Apgar scores at 1 and 5 minutes or route of delivery. However, there was a statistically significant low birth weight that may be associated rather with severe complications that require urgent delivery such as severe preeclampsia than with Bell's palsy alone<sup>(9)</sup>.

With regards to management and treatment, different strategies – not only medical but also surgical options – have been considered.

The neurological ENT examination, as well as the methods of exploring the facial nerve are necessary for a possible differential diagnosis with other peripheral facial paresis (occurring in pregnancy), unilateral, which could be of another etiology and not triggered by the state of gestation – trauma, parotid cancer, pontocerebellar angle tumors, basilar trunk aneurysms, Melkersson-Rosenthal syndrome etc.<sup>(5)</sup>.

After a careful neurological and ENT assessment, an ophthalmological examination of eyelid closure and corneal protection is needed, as a significant risk with secondary damage or loss of sight must be excluded. Further investigations, such as head and brain computerized tomography or nuclear magnetic resonance imaging, may show inflammation and ischemia<sup>(11)</sup>.

Conservative management strategies include patient's education regarding possible severe complications associated with Bell's palsy such as preeclampsia and gestational hypertension and the signs and symptoms to be aware of. The observation related to typical and atypical features of idiopathic facial palsy and emotional support in dealing with facial problems may decrease the self-confidence and cause depression and anxiety.

In order to improve eye protection, the prescription of artificial lubricants by the ophthalmologist may be

needed, as well as temporary eye closure and adequate fluid intake and a humidified environment<sup>(8)</sup>.

Bell's palsy registers usually a full resolution and recovery after birth under supportive medical treatment. Different therapeutic agents, including diuretics to improve perineural oedema<sup>(12)</sup>, antivirals<sup>(13)</sup>, pentoxifylline<sup>(14)</sup> and corticosteroids, have been used. Due to the lack of safety studies in pregnancy for most of these agents, the only therapeutic approach that has demonstrated rarely adverse reactions and fully efficacy in pregnancy are corticosteroids. Steroids should be administered in the first days of onset of the condition<sup>(15)</sup>. Assessing the safety of corticosteroids in pregnancy depends on maternal history, dosage and type of steroids. Maternal disorders include reactivation of peptic ulcers, fluid retention, exacerbation of diabetes and psychosis. On the other hand, fetal reported risks are adrenal suppression, low birth weight or increased risk of anatomical defects when administered early in pregnancy. Prednisone and methylprednisolone may be used during pregnancy, especially for maternal indications, as the placenta converts them to the inactive form and have limited effects on the fetus. Steroids such as dexamethasone and betamethasone are usually associated with fetal treatment, being largely recommended for promoting fetal lung maturation in preterm pregnancies<sup>(16)</sup>. Corticosteroid treatment should be closely monitored by following the blood glucose, body weight and fetal growth and well-being. After birth, a small fraction of the therapeutic dose is secreted in breast milk, therefore it has been shown that infants are not at increased risk<sup>(14)</sup>.

Antiviral therapy in the treatment of Bell's palsy in pregnancy has less supporting evidence-based studies, therefore further testing is required in order to consider them as a frontline therapy<sup>(15)</sup>.

The severe cases may need surgical management that includes surgical decompression of the facial nerve<sup>(17)</sup> or interventions through ophthalmic plastic surgery in order to protect the eyelid function<sup>(18)</sup>.

Several studies have compared the outcome and the period of achieving complete resolution of Bell's palsy with treatment (mainly represented by steroids) and without treatment. Some groups showed a faster recovery when compared to control groups, with an around 20% difference<sup>(15)</sup>. Others showed that the majority of the patients completely recovered without medical treatment within six months<sup>(19)</sup>. The prognosis for pregnant women with incomplete paralysis is good, with the spontaneous recovery or minimal sequelae, whereas the forms with complete paralysis and persistent deficits may benefit from corticosteroid treatment to improve the time of resolution and the prognosis. Long-term sequelae include aberrant nerve regeneration and permanent paralysis which may be avoided with the early administration of steroids<sup>(20)</sup>.

In case of incomplete nerve recovery, an additional exercise program is recommended. On one hand, a residual function of the facial nerve will be obtained and,

on the other hand, the regeneration of the nerve will be accelerated<sup>(5)</sup>.

In conclusion, although a relatively rare condition in pregnancy, Bell's palsy needs a careful assessment of maternal characteristics in order to rule out possible associated pregnancy-related complications such as preeclampsia, gestational hypertension or gestational diabetes, along with ophthalmic and neurologic assessment to evaluate the severity of the disease. Follow-up, according to currently guidelines, is need if any of the aforementioned conditions are encountered.

A therapeutic approach using early treatment with corticosteroids such as prednisone or methylprednisolone may fasten the recovery, therefore improving the prognosis by reducing potential long-term sequelae. Further studies that compare treatment dosage, therapeutic agents and time of recovery when treating Bell's palsy are needed to update the currently management. ■

**Conflicts of interests:** The authors declare no conflict of interests.

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