Title: A Comparative Analysis of Bell's Palsy Characteristics Before and After the COVID-19 Pandemic Using a Multi-Institutional Database

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Background: Bell's Palsy is an acute, idiopathic facial nerve paralysis. Though widely studied, the influence of the COVID-19 pandemic on the epidemiologic and metabolic characteristics of Bell's Palsy remains unclear. The objective of our study was to investigate differences in demographic, clinical, and metabolic parameters of Bell's Palsy patients before and after the COVID-19 pandemic.

Methods: A retrospective review was conducted using the TriNetX database. Patients diagnosed with Bell's Palsy (ICD-G51.0) were grouped into two cohorts: pre-pandemic (2015–2019, n=111,476) and post-pandemic (2021–2025, n=127,962). Data from 2020 were excluded to avoid confounding from quarantine-related care disruptions. Patient demographics, laboratory values, and vital signs were compared using t-tests and Chi-square analyses. Effect sizes were calculated for significant findings.

Results: Post-pandemic Bell's Palsy patients had a significantly lower mean age at diagnosis (53.4 vs. 56.9 years; $p<0.0001$, $d=0.168$). Increases were observed in both male and female cases, with a slight rise in the male-to-female ratio ($p<0.0001$). Post-pandemic patients showed significantly higher mean body weight, BMI percentile, and diastolic blood pressure. There were modest increases in total and LDL cholesterol, and a slight decrease in HDL cholesterol. Notably, blood glucose levels were unchanged, while BUN and creatinine levels were significantly reduced post-pandemic.

Conclusions: Following the COVID-19 pandemic, Bell's Palsy cases became more frequent, occurred at a younger age, showed a higher male-to-female ratio, and were associated with increased BMI, LDL cholesterol, and diastolic blood pressure. Blood glucose levels remained unchanged, while BUN and creatinine levels were significantly reduced. Collectively, these findings suggest that pandemic-related lifestyle and dietary factors may have influenced both the metabolic and clinical profiles of this patient population.