International Journal of Otorhinolaryngology and Head and Neck Surgery
Srinivas CV et al. Int J Otorhinolaryngol Head Neck Surg. 2020 Nov;6(11):2042-2045
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

DOI: https://dx.doi.org/10.18203/issn.2454-5929.ijohns20204628

Original Research Article

The surge of Bell's palsy in COVID - pandemic era

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Received: 28 August 2020
Revised: 09 October 2020
Accepted: 13 October 2020

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ABSTRACT

Background: COVID-19 is declared as a pandemic by WHO. Bell's palsy is defined as isolated, sudden, peripheral facial paralysis of unknown etiology. Viral infections are capable of causing facial paralysis through infecting the motor neurons of brainstem, seventh nerve ganglia or through infections of supporting cells of the nerve, along with secondary inflammation and oedema, blocking the nerve function. Similarly, coronaviruses are known to have a neuroinvasive propensity.
Methods: Our study was aimed to report the increased number of cases of Bell's palsy in the current COVID pandemic era and to hypothesize the probable role of coronavirus in the pathogenesis of Bell's palsy. A total of 30 patients presenting with unilateral facial palsy in this COVID era were included in the study.
Results: This prospective analysis of Bell's palsy cases showed 30 cases in the COVID pandemic era, where the total number of OPD patients were 3720. This shows a percentage of Bell's palsy cases as 0.8 % when compared to 0.05% in the pre-covid time.
Conclusions: This study shows that there might be an effect of COVID-19 virus on the immune status of the individuals along with stress induced reactivation of underlying viral infection.

Keywords: Bell's palsy, COVID19, Novel coronavirus

INTRODUCTION

Coronavirus disease 2019 was classified as a pandemic by WHO and the novel virus is officially named COVID-19.[1] It started as an outbreak of pneumonia in December 2019 in Wuhan city, China. Patients with COVID-19 exhibit mild-moderate symptoms, with about 15% progressing to severe pneumonia and 5% eventually develop ARDS, septic shock and multiple organ failure and few patients are usually asymptomatic.[2]

Patients present with fever, cough, breathlessness, diarrhoea, fatigue and some patients develop neurological symptoms like dizziness, headache, impaired consciousness, acute cerebro-vascular disease, seizures, ataxia and peripheral nerve involvement with loss of smell or taste and neuralgias.[3,4]

Bell's palsy is defined as an isolated, sudden, peripheral facial paralysis of unknown etiology and patients usually show spontaneous recovery. It is said to be prevalent among lower socioeconomic groups and densely populated areas as shown by the serological evidence of viral infection.[5] The worldwide annual incidence of Bell's palsy is 15-30 cases per 1,00,000 population.[6] Though the etiology and pathogenesis of Bell's palsy is mostly unknown, certain cases are usually preceded by mild infection having a suspected viral origin. Studies have shown that viruses such as herpes simplex, rubeola, rubella, mumps, reovirus, vaccinia, varicella zoster, poliovirus, Epstein Barr virus and influenza have been associated with Bell's palsy.[7]

Hence, we suspect a similar role of Novel coronavirus as a cause for the increasing incidence of Bell's palsy in this pandemic era.

METHODS

Our study is aimed to report the increased number of cases of Bell's palsy in the current COVID pandemic era and to hypothesize the probable role of coronavirus in the pathogenesis of Bell's palsy.

This is a prospective descriptive study conducted in the ENT OPD of DR. B. R. Ambedkar Medical College and Hospital, Bangalore; between March 2020 and July 2020.

A total of 30 patients presenting with unilateral facial palsy were included in the study. Patients were initially screened at the COVID fever clinic and all were found to be asymptomatic, but no confirmatory COVID-19 testing was performed as patients were non-compliant. In fact 1 patient was lost to follow up when asked to get COVID-19 testing done, due to the stigma attached to the virus and testing.

Patients with ear complaints, previous ear/parotid surgeries, immunodeficiency disorders, trauma, patients with similar past history and those who were already on treatment for facial palsy were excluded from the study.

Clinical evaluation and treatment

A detailed ENT and neurological examination was performed on all patients. Facial nerve examination was done in detail and graded according to the House-Brackmann grading system (Figure 1).

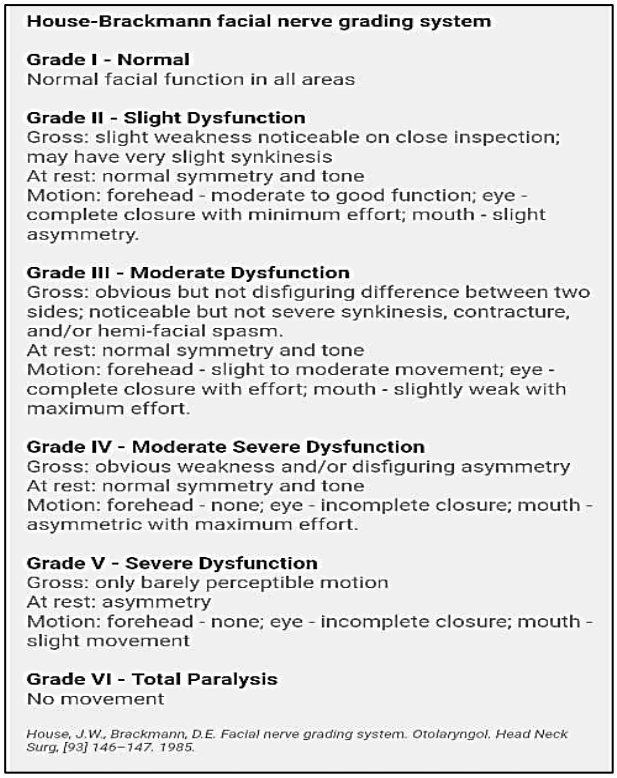

Figure 1: House-Brackmann facial nerve grading system.

Additional manifestations like skin lesions, hearing loss and neuralgia were noted.

All patients were given the below standard treatment:

Oral steroids: Prednisolone was given as 1 mg/kg/day in 3 divided doses; tapered gradually every 3 days. Total treatment was for 12 days.

Vasodilators: Pentoxyfilline 400 mg OD for 15 days.

Neuroprotectives: Given OD for 15 days.

Eye management: Lubricant eye drops with antibiotic eye ointment were advised along with eye taping at night.

Physiotherapy was also advised.

Certain patients with skin lesions and neuralgia were also prescribed antivirals (Acyclovir 800 mg QID *5 days) and analgesics (paracetamol/tramadol).

Statistical analysis was performed using Microsoft Excel 2007.

RESULTS

A total of 30 patients presenting with facial palsy were included in the study. Two patients had additional symptoms of vesicular eruptions and neuralgia and hence were diagnosed as Herpes zoster oticus. The rest 28 patients were classified as Idiopathic facial palsy.

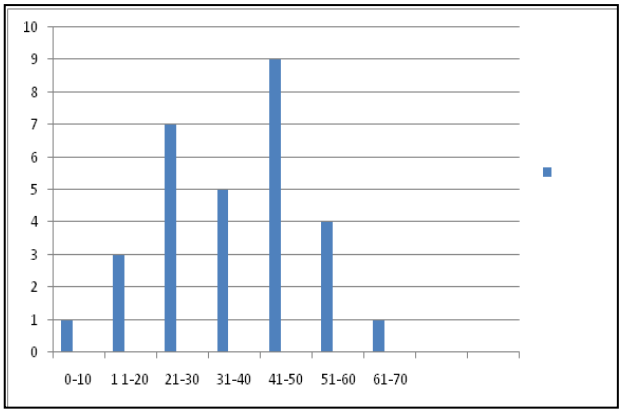

Figure 2: Age distribution chart.

The mean age was 36.4 years with major age group between 20-50 years (Figure 2). However we also had 4 patients in the younger age group (<20 years), which wasn't this common in the pre-covid time. There was no significant gender preponderance (male=16, female=14). Four patients had associated diabetes mellitus and one patient was diagnosed with psoriasis. Most of the patients (60%) presented with grade IV House-Brackmann facial palsy. There was a slight right sided Bell's palsy dominance (Right=60%, Left=40%) (Figure 3).

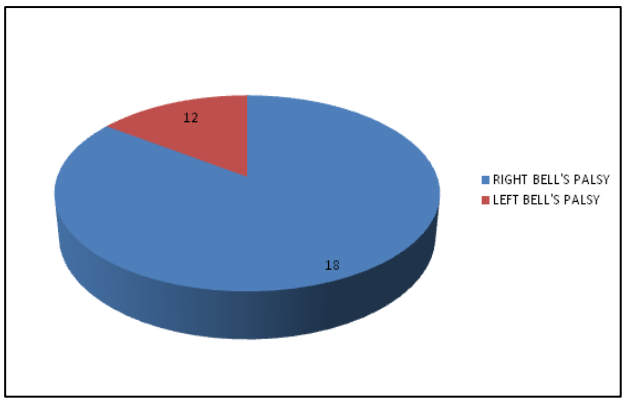

Figure 3: Side of Bell's palsy.

Patients were followed up for 3 weeks from the initiation of treatment (Figure 4). There was complete recovery (grade I) in 23 patients (76.6%) and 2 patients were lost to follow up.

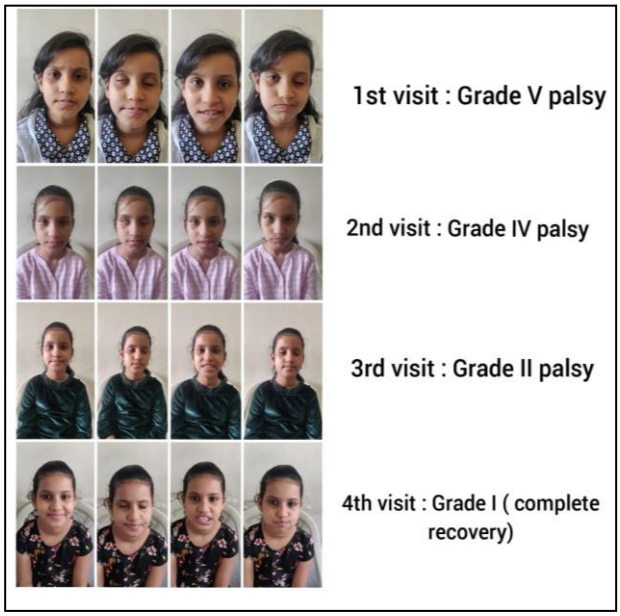

Figure 4: 9-year old with right Bell's palsy.

This prospective analysis of Bell's palsy cases showed 30 cases in the COVID pandemic era (March 2020 - July 2020), where the total number of patients reporting to the ENT OPD during this time were 3720. This shows a percentage of Bell's palsy cases as 0.8%. This when compared retrospectively 5 months before COVID, shows just 9 cases from October 2019 to February 2020, where total OPD patients were 16,400 (0.05%).

This shows a significant surge of Bell's palsy cases in the current pandemic era.

DISCUSSION

Viral infections are capable of causing facial paralysis by infecting the motor neurons of brainstem, seventh nerve ganglia or through infections of supporting cells of the nerve, along with secondary inflammation and oedema, blocking the nerve function.[7] Similarly, coronaviruses are also known to have a neuroinvasive propensity. Asymptomatic individuals may have recoverable viruses in their nasopharynx reflecting the prevalence of virus in the community or representing an exacerbation of a latent infection.[7]

In 2019, a new virus was identified in China named Novel Coronavirus (COVID-19) and was declared as a pandemic by WHO on 11th March 2020.[8] COVID-19 virus is reported to be a new member of beta-coronavirus genus and is closely related to SARS-COV.[9] It is a single stranded, non segmented, positive sense RNA virus, named so for its crown-like appearance on electron microscopy. Coronaviruses are enveloped viruses, measuring 80-160 nm in size, with glycoproteins E1 and E2 appearing as club shaped projections on the surface envelope and a core nucleoprotein N (Figure 5).[10]

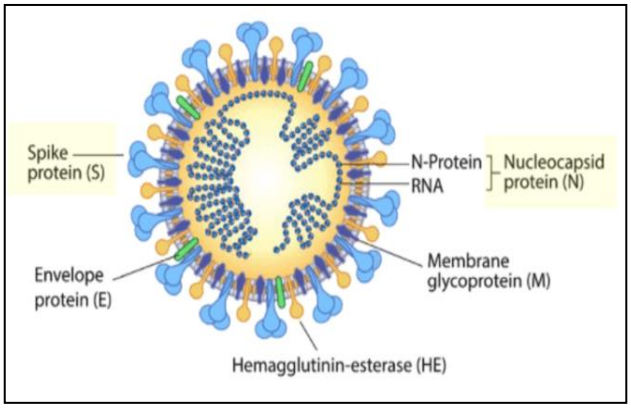

Figure 5: Novel coronavirus structure.

Facial nerve palsy can be associated with infections most commonly herpes simplex and herpes zoster viruses. The exact pathogenesis of Bell's palsy remains unclear but its association with neurotropic herpes virus is thought to be related to its axonal spread and viral replication leading to inflammation and demyelination.[11] Reactivation of herpes simplex or varicella zoster may be due to super infection by a heterotypic virus. Neurological manifestations of COVID-19 have been reported to have an incidence of 36.4%.[11] According to a study by Ikeda et al, indicates a strong association between the depression of cellular immunity (due to stress, common cold viruses, physical fatigue) and reactivation of varicella zoster infection.[12] This may be the cause of varicella zoster oticus in 2 of our patients.

Coronaviruses can cause nervous tissue injuries through several known mechanisms like direct infection injury, hypoxia, ACE 2 receptors and immune injury.[13] In a study by Fang et al, they have hypothesized that patients of diabetes and hypertension, on treatment with ACE 2 stimulating drugs have increased risk of developing severe and fatal COVID19.[14]

Several studies have agreed that COVID-19 infection is associated mostly with reduction in lymphocytes, monocytes and eosinophils with drastically reduced number of CD4+T cells, CD8+T cells, B cells and NK cells. This might lead to immunosuppression and increased susceptibility to infections as well as reactivation of latent infections. Hence, we hypothesize the probable role of coronavirus in the surge of Bell's palsy cases.

CONCLUSION

Bell's palsy usually has an unknown etiology with probable viral origin due to reactivation of latent infection. The increased number of Bell's palsy cases could be related to the pandemic. This study hence shows that there might be an effect of COVID-19 virus on the immune status of the individuals along with stress induced reactivation of underlying viral infection. However, there is a need of further evaluation and diagnostic tests to confirm the correlation of Bell's palsy and novel coronavirus.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Srinivas CV, Kauser S, Sangoli B. The surge of Bell's palsy in covid- pandemic era. Int J Otorhinolaryngol Head Neck Surg 2020;6:2042-5.