Journal of Advanced Zoology

ISSN: 0253-7214
*Volume **44** Issue **S-6 Year 2023** Page **1728:1734***

The Inter-Relation of Objective Assessment of The Bell's Palsy with House-Brackmann Score: A Prospective Study

Bhavya E[1]*, Bhavadharini P[2], Bargavi E[2], Arulmozhi C[2], Vivekanandan K[1], N Venkateshan[3]

[1]Professor, Department of Pharmacy Practice, Arulmigu Kalasalingam College of Pharmacy, Krishnankoil-626126
[2]Pharm D, Department of Pharmacy Practice, Arulmigu Kalasalingam College of Pharmacy, Krishnankoil-626126
[3]Professor, Department of Pharmaceutical Chemistry, Arulmigu Kalasalingam College of Pharmacy, Krishnankoil-626126

**Corresponding author's: Bhavya E*

Article History

Received: 06 June 2023
Revised: 05 Sept 2023
Accepted: 09 Dec 2023

Abstract

Introduction: *Bell's palsy is the most common acute peripheral mononeuropathy, which leads to the partial or complete inability to voluntary movement of the facial muscles on the affected side of the face. The study aimed to evaluate the objective assessment of the Bell's palsy with House-Brackmann score.* ***Methods:*** *This Observational, Prospective study was to be conducted at tertiary care hospital among from June 2022 to September 2022 on 11 patients diagnosed with Bell's Palsy. A patient's history includes age, sex, and clinical features. Assessments include facial nerve grading system such as House-Brackmann score, which was used to grade the facial nerve severity.* ***Results:*** *Out of 11 patients, 7 patients of Bell's Palsy (63%) were reported with Grade IV of House- Brackmann score. The remaining patients were scored under Grade III and Grade V. Patients of age group from 9 to 75 were taken. Among them, age group of 9-40 years were 45% and 40- 80 years were 55%. The result shows that Grade IV is predominant over others, male and elder patients are leading over female and middle- aged patients. 63.7% patient's clinical features were come under Grade IV of House- Brackmann score. 27.2% of patients had an increased risk of hypertension, 18.1% had Diabetes Mellitus, 18.1% had past history of CVA, 9% had past history of Seizure, and known history of Bell 's palsy.* ***Conclusion:*** *Using the House-Brackmann grading system, the severity of the patient presenting with Bell's palsy could be reliably predicted.*

Keywords: *Bell's palsy, Observational study, House-Brackmann score, Clinical features, and Severity.*

1. Introduction

Bell's palsy is a prevalent medical condition that primarily affects the seventh cranial nerve (CNVII), leading to the rapid onset of weakness in the facial muscles on one side of the face. This condition can result in either partial or complete loss of voluntary control over the muscles in the affected region of the face.[1] The causes of Bell's palsy can be quite diverse, ranging from immune system responses and infections to reduced blood flow (ischemia) to the facial nerve. While Bell's palsy frequently resolves on its own, during its course, it can temporarily impair a person's ability to perform essential tasks like closing the affected eye and managing their facial expressions. This, in turn, can increase the risk of eye injuries.

In certain instances, Bell's palsy may lead to long-term complications that prove to be emotionally and physically distressing for those affected.[2] The unpredictable and sometimes persistent nature of this condition underscores the importance of understanding and effectively managing its symptoms.

The exact cause of Bell's palsy remains largely unknown, making it an idiopathic condition. What is observed in individuals with Bell's palsy is swelling and inflammation of the seventh cranial nerve (CNVII).[3] The potential triggers for this condition are varied and include factors such as

microcirculatory issues affecting the vasonervorum, viral infections, ischemic neuropathy, autoimmune responses, as well as surgical procedures like local anaesthesia, tooth extractions, osteotomies, preprosthetic procedures, tumor or cyst removals, surgeries related to the temporomandibular joint, and the treatment of facial fractures and cleft lip/palate.[4, 5]

Bell's palsy impacts approximately 40,000 individuals in the United States each year, affecting people of all genders and ages. However, it appears to be most prevalent among those aged 15 to 45, accounting for about 60-75% of cases involving sudden one-sided facial paralysis. The annual incidence rate of Bell's palsy is between 15 to 30 cases per 100,000 people, with both men and women being equally affected.[6]

The condition doesn't show a preference for either side of the face, and there's no specific seasonal pattern. Individuals who've experienced one episode of Bell's palsy face an 8% risk of recurrence. Risk factors such as diabetes and hypertension have been mentioned but with inconclusive evidence, and older age, absence of ear pain, complete paralysis, and reduced tearing have been associated with a less favourable recovery prognosis.[7]

Lower motor neuron (LMN) facial palsy is characterized by the one-sided paralysis of all facial muscles, affecting both voluntary and emotional expressions. Additionally, there can be issues with saliva causing dribbling and food accumulating in the mouth, as well as plaque on the affected side's teeth. Depending on the location of the problem, other symptoms like altered taste or increased sensitivity to sound (hyperacusis) may be present. The most common and noticeable symptom is the sudden weakness of one side of the face, resulting in significant facial distortion, drooling, dryness in one eye, and excessive tearing. Other potential symptoms include jaw or ear pain, headaches, changes in tear and saliva production, numbness on one side of the face, difficulty in pronouncing certain words, muscle twitches in the face, and eye irritation on the affected side.[8] In rare cases, Bell's palsy can affect both sides of the face.

A comprehensive diagnosis relies on a careful history and physical examination. When gathering the patient's history, it is essential to inquire about their symptoms. In the initial stages, electro diagnostic testing may not offer reliable results, but it becomes more useful after about two weeks, as it can detect nerve enervation and show signs of nerve regeneration.[9]

In the management of Bell's palsy or facial nerve palsy, the fundamental pharmacological approach involves early short-term use of oral glucocorticoids.[10, 11] In severe acute cases, combining antiviral therapy with glucocorticoids may offer improved outcomes. Furthermore, ensuring proper eye care is crucial for patients experiencing difficulties with incomplete eye closure. [12, 13]

2. Materials And Methods

The observational, prospective study was conducted at the tertiary care hospital for 4 months from June 2022 to September 2022 on 11 patients admitted with Bell’s palsy. All the patients were explained the study design at the time of enrolment, and detailed consent regarding their willingness for the participation was obtained.

Inclusion criteria:

- Patients affected by acute onset facial paralysis without any detectable cause
- Both younger and elder patients
- Male and female sex were included.

Exclusion criteria:

- Patient record with incomplete required information
- Patients with bilateral facial paralysis
- Patients who are not willing to participate in the study
- Absence of imaging diagnosis
- Known traumatic inflammatory and neoplastic pathology of the facial nerve in its intra or extra cranial course were excluded from the study.

On admission, a detailed history, physical and neurological examination, and assessed the severity of the symptoms were done through House-Brackmann score.

Statistical analysis:

The data were expressed as number and percentage. Statistical analysis was calculated using Microsoft excel.

3. Results and Discussion

Out of 11 patients, 6 (54.5%) of them are male and 5 (45.4%) were female patients. Patients of age group from 9 to 75 were taken. Among them, age group of 9-40 years were 45% and 40- 80 years were 55% (Table 1).

Table 1: % Distribution of patients based on age and gender

		Frequency	Percentage
Gender	Male	6	54.5%
	Female	5	45.4%
Age Group	8-20	2	18.5%
	21-45	3	27.2%
	46-75	6	55.4%

From the collected data, about 7 (63.7%) patient's clinical features were come under Grade IV of House- Brackmann score. 2 (18.5%) of them were come under Grade V score and the remaining 2 (18.5%) patients were come under Grade III score (Table. 02).

Table 2: Distribution of patients based on grading score

Grading Score	Number Of Patients	Percentage
III	2	18.5%
IV	7	63.7%
V	2	18.5%

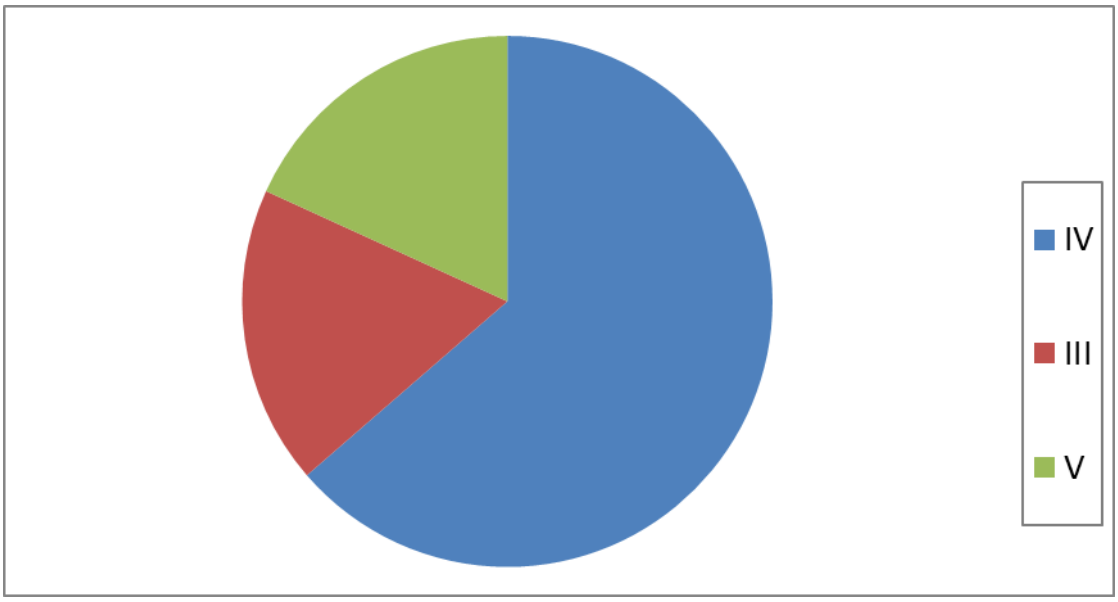


Figure 1: Distribution of patients based on grading score

In this study, 92% of clinical features were associated with mouth; 86% were associated with eyes; 34% were associated with face and 9% were associated with forehead (Table 3).

Table 3: Percentage showing number of clinical features in each category

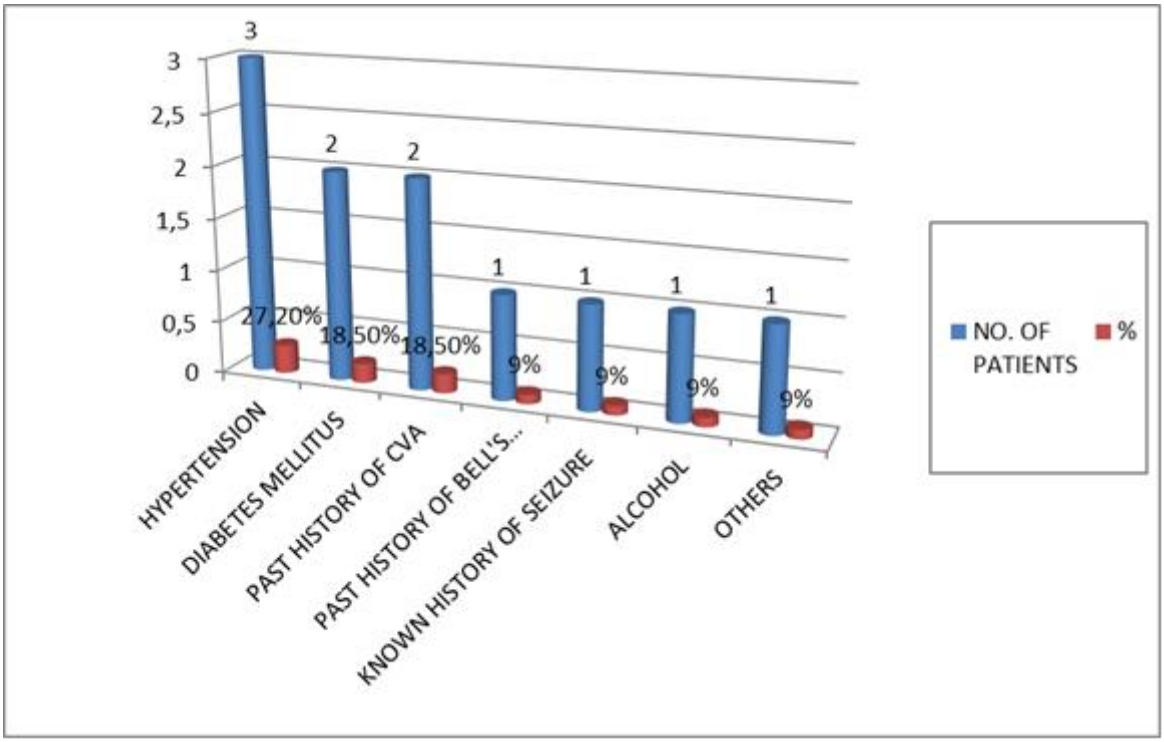
Category Of Scoring	Number Of Clinical Features	Percentage
Eyes	8	86%
Face	4	34%
Forehead	2	9%
Mouth	10	92%

27.2% of Hypertension, 18.1% of Diabetes Mellitus, 18.1% of Past history of CVA, 9% of Alcohol-induced, Past history of Seizure, known history of Bell's Palsy, and Dental extraction showed to be the common risk factors (Table 04).

Table 4: Percentage showing the distribution of patients based on risk factors or co morbid conditions

Risk Factor / Co-Morbid Conditions	Number Of Patients	Percentage
Hypertension	3	27.2%
Diabetes Mellitus	2	18.5%
Past History of CVA	2	18.5%
Known History of Bell's Palsy	1	9%
Known History of Seizure Disorder	1	9%
Alcohol	1	9%
Others	1	9%

Figure 2: Distribution of patients based on risk factors or co morbid conditions



The percentage of treatment of Bell's Palsy mainly focused here on Anti- inflammatory medicines-Corticosteroids (Prednisone and Methyl prednisolone) were associated with 63.7%, Non-Pharmacological therapy(Physiotherapy and facial exercises) with 55%, Anti- hypertensives such as (Amlodipine, Nifidipine and Enalapril) with 45.4%, Anti-platelet agents such as Aspirin and Clopidogrel with 36.3%, Ophthalmic medications such as eye lubricant (Polyvinyl alcohol eye drops, Hydroxyl Propyl methyl cellulose ointment) with 18.2% and HMG- CoA reductase inhibitors (Atorvastatin) with 9%. and OHA with 9%.

Table 5: Distribution of patients based on management criteria

Management Criteria	Number Of Patients	Percentage
Anti- Inflammatory/ Corticosteroids	7	63.7%
Anti- Hypertensives	5	45.4%
Ophthalmic Medications	2	18.2%
Anti- Platelets	4	36.3%
HMG Coa - Reductase Inhibitors	1	9%
Physiotherapy/ Facial Exercises	6	55%
Oral Hypoglycemic Agents	1	9%

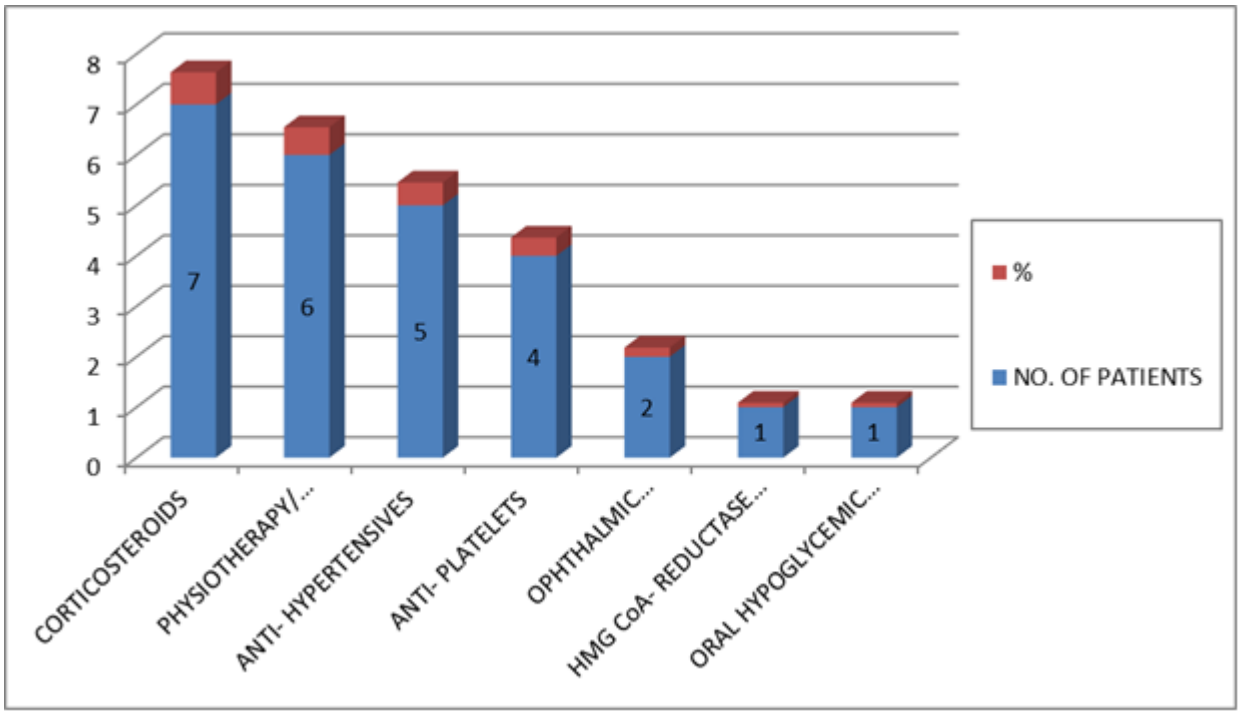


Figure 3: Distribution of patients based on management criteria

From the collected evidence, 20% of patients were seems to be less severe and recovered early (Due to Grade III) and the remaining 80% of patients are showing severe dysfunction and late recovery (Due to Grade IV and V).

Table 6: Percentage showing distribution of patients based on their severity

Grading Score	Number Of Patients	Severity	Percentage
III	2	Less severe	18.5%
IV	7	Moderate severe	63.7%
V	2	Severe dysfunction	18.5%

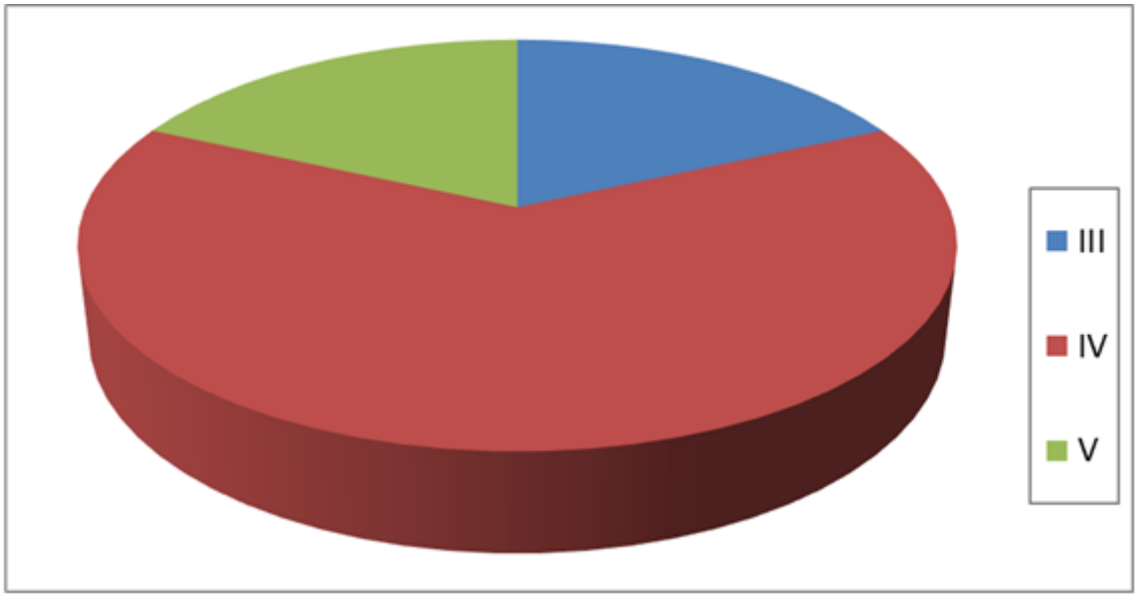


Figure 4: Distribution of patients based on their severity

Table 7: showing which grade of patients could recover fast

Grading Score	Severity Of Patients	Percentage Of Recovery
III	Less severe	55%
IV	Moderate severe	35%
V	Severe dysfunction	10%

Discussion

In the present study, 54.5% were reported by male and 45.5% were reported as female. It shows that male subjects were predominant over females. But commonly, this condition can be equivalent in both genders. This condition can mainly occur as an impact of seasonal changes (Cold weather), Infection (viral), also due to age group. Majority of the cases of 55.4% were reported among 46-75 years of age, 27.2 % of 21-45 years of age 18.5% of 8-20 years of age.

Of all the 11 patients, 63.7% can be affected by their right side and remaining 36.3% by their left side. But the condition's severity may not depend upon the side it affects. In addition to the above factors, it can also be triggered by several Co morbidities like hypertension, diabetes mellitus, past history of Bell's palsy, past history of seizure, past history of CVA, alcohol and others. In our study, out of 11, 92% of clinical features were reported in mouth, followed by 86% in eyes, 34% in face and 9% in forehead. This result was similar with the study carried by Mustafa Ahmed Hassan et al., [14]

Several diagnostic criteria were used to monitor symptoms of Bell's palsy. This study was mainly assessed using House-Brackmann scoring system. Also, this study shows that grading score with the percentage of 55% were comes under grade III, 35% of grade IV and 10% of grade V. The severity of the condition may also depend on these grades. The percentage of patients based on their severity includes 63.7% were moderately severe, 18.5% were both less severe and severe dysfunction. In this study, 27.2% were due to hypertension, 18.5% were due to diabetes and past history of CVA, 9% were due to past history of seizure, alcohol and others. These study reports were somewhat similar to the report of Urban et al., [15]

In our study, the management criteria include the highest percentage of 63.7% were reported over corticosteroids, subsequently 55% of physiotherapy/ facial exercises, 45.4% of anti- hypertensive agents, 18.2% of ophthalmic medications. Finally, the symptoms will subside as a result of 55% recovery in grade III, 35% recovery in grade IV and 10% in grade V.

4. Conclusion

From the prospective observational study, the analysis of the subjective evidence has been done using House-Brackmann grading system and this condition seems to be idiopathic. There are several factors like age, gender, co morbidities, severity of existing condition, drugs (past medication) could further make the condition worse. This study proves that the monitoring of Bell's palsy condition mainly done through the grading score and diagnostic criteria is necessary for the disease. This study also explains the main difference between facial paralysis and Bell's palsy. Even though, both conditions seem to be analogous to one another, the main variation in Bell's palsy is occurred due to lower motor nerve dysfunction whereas, facial paralysis is due to the upper motor nerve dysfunction. After conformation, the management should be mainly focused on non-pharmacological goals including physiotherapy, facial exercises, acupuncture, etc. Surgery significantly benefits a small group of patients with severe Bell's palsy patients. By concluding that prompt diagnosis and effective management is beneficial among patient to improve the quality of life.

Acknowledgment

We would like to express our gratitude and sincere thanks to all physicians, nurses and staff members of the concern hospital for being the chief provider of medical care and management for the patient and granting access to the patient's medical records.

Conflict of Interest

No conflict of interest is to be disclosed.

References:

1. Wilson-Pauwels L, Stewart PA, Akesson EJ, Spacey SD. Cranial nerves: function and dysfunction. PMPH USA; 2010.
2. Kozu H, Tamura E, Parry GJ (1992) Endoneurial blood supply to peripheral nerves is not uniform. J Neurol Sci 111:204–208. https://doi.org/10.1016/0022-510X(92)90070-2.
3. Jannetta PJ, Segal RI, Wolfson Jr SK. Neurogenic hypertension: etiology and surgical treatment. I. Observations in 53 patients. Annals of surgery. 1985 Mar;201(3):391.
4. Eviston TJ, Croxson GR, Kennedy PG, Hadlock T, Krishnan AV. Bell's Palsy: aetiology, clinical features and multidisciplinary care. Journal of Neurology, Neurosurgery & Psychiatry. 2015 Dec 1;86(12):1356-61.
5. Nukada H (2014) Ischemia and diabetic neuropathy. Handb Clin Neurol 126:469–487. https://doi.org/10.1016/B978-0-444-53480-4.00023-0.

6. Monini S, Lazzarino AI, Iacolucci C, Buffoni A, Barbara M (2010) Epidemiology of Bell's Palsy in an Italian Health District: incidence and case–control study. Acta Otorhinolaryngol Ital 30(4):198
7. Lee SY, Seong J, Kim YH. Clinical implication of facial nerve decompression in complete Bell's Palsy: a systematic review and meta-analysis. Clinical and experimental otorhinolaryngology. 2019 Nov;12(4):348.
8. Holland NJ, Bernstein JM. Bell's Palsy. BMJ clinical evidence. 2014;2014.
9. Abu Mettleq AS, Dheir IM, Elsharif AA, Abu-Naser SS. Expert System for the Diagnosis of Seventh Nerve Inflammation (Bell's Palsy) Disease.
10. Alakram P, Puckree T. Effects of electrical stimulation on house-brackmann scores in early bells palsy. Physiotherapy theory and practice. 2010 Jan 1;26(3):160-6.
11. Lockhart P, Daly F, Pitkethly M, Comerford N, Sullivan F. Antiviral treatment for Bell's Palsy (idiopathic facial paralysis). Cochrane Database Syst Rev. 2009;(4):CD001869.
12. Heckmann JG, Urban PP, Pitz S, Guntinas-Lichius O. The diagnosis and treatment of idiopathic facial paresis (Bell's Palsy). Deutsches Ärzteblatt International. 2019 Oct;116(41):692.
13. KONDO A, ISHIKAWA JI, YAMASAKI T, KONISHI T. Micro vascular decompression of cranial nerves, particularly of the 7th cranial nerve. Neurologia medico-chirurgica. 1980;20(7):739-51.
14. Mustafa AH, Suleiman AM. Bell's palsy: a prospective study. International Journal of Dentistry. 2020 Mar 16;2020.
15. Urban E, Volk GF, Geißler K, Thielker J, Dittberner A, Klingner C, Witte OW, Guntinas Lichius O. Prognostic factors for the outcome of Bells' palsy: A cohort register based study. Clinical Otolaryngology. 2020 Sep;45(5):754-61.