



Belly's Palsy with Clinical Manifestation and Diagnosis- A Review

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Review Article

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ABSTRACT

Bell's Palsy is one of communal disease of effected to seventh cranial nerve that causes paralysis of one or two side of the face which occur within (72 hours), the etiology unknown but different causes such as psychological, physical condition, viral infection, ischemia of blood vessels, and autoimmune inflammation. The individuals are more susceptible to effected such as pregnancies, severe preeclampsia, obese persons, hypertensive patients, diabetic mellitus, it suspected for both sex male and female, also occur in all age but increase within ages that very important to determined type of treatments . During the clinical examination, the Bell's Palsy patient suffer from weakness of muscle of the face, wrinkling forehead, hyper-acusis blink, the face became asymmetrical and the lip ruck up, the corner of the mouth move upward, the naso-labial folds obliterated, weakness of buccinator muscles that lead to the food stay in labial, buccal vestibule in upper and lower jaw, half of face drooped causes of expression altered severely occur like mask. The aim of review bring attention for determined the etiology of Bell's Palsy, early diagnosis of disease by clinical examination to reach perfect therapy and acceleration recovery time and

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decreased complete facial paralysis. Conclusion: the authors conclude that it is important to evaluate the drug act to regenerate the nerve and modify the treatment to get effected drug with little symptom, also modification of physical therapy to accelerate healing. Dental management for this patient by motivation of them to maintain oral hygiene and modification dental treatment to return mastication of food, brushing, whistling and using dental prosthesis to restore facial function. Also help the psychological condition of the patient to get positive energy to withstand the disease and get ride.

Keywords: Belly's palsy; clinical manifestation; diagnosis.

1. INTRODUCTION

The seventh cranial (facial) nerve represent of motor and sensory nerve that stimulated for secretion of saliva and lacrimal, test sensation, expression for the face and ear sensation. The ventrally part of ponto-medullary junction which originate facial nerve from brainstem lower pons, which pass 20-30mm through canal of facial nerve [1]. From the facial's canal (inferior, posterior turn) genu which nearest to "geniculate ganglion" that composed of taste sensory nerve and sensory sense, but the motor neuron pass through foramen of stylomastoid to reach the largest gland " parotid" lead to form 2 trunks "cervicofacial and temporofacial" [2]. The seventh nerve supply the muscle of expression of face, its divided for five neurons as in following [2].

1. The temporal neuron for the upper region of the orbicularis oculi and forehead muscles
2. The zygomatic neuron for cheek "zygomaticus, nasalis" and fold of nasolabial muscles.
3. The buccal neuron for lower region of orbicularis oculi and buccinators muscles.
4. The marginal mandibular neuron for depressor muscle" mentalis, anguli"
5. The cervical neuron for muscles of platysma.

The nervus intermedius sensory branch of facial neuron represent of sensation of anterior two 1/3 of the tongue and parasympathetic branch of facial neuron represent of regulator flowing of tears from lacrimal gland and flowing of saliva from salivary gland [3].

Bell's Palsy is one communal of neuromuscular diseases due damage of five nerve [4] it is disorder for peripheral nerves that five nerve within it [4].

Individuals who are more suspected to exposure like pregnancy females, diabetic mellitus, severe

preeclampsia patients, hypertensive patients, and obese persons [5,6]. The main reason for Bell's Palsy not clear but may be explain such as activation of herpes viruses act to demyelinated nerve fibers [7], or different theory like autoimmune inflammation, ischaemia in blood vessel and contact with cold air current [8]. People exposure to the disease about (20 – 30) case to (100,000) during the year [9]. About (60-75)% form effected patients unilateral paralysis in face [10]. Male and female effected same, the incidence median age suspected in(40 years) but Bell's Palsy appear within every ages [11]. It's less occur in small child below (10 years) more occur within (10-29 years) stay constant within (30-69 years) and increased effected older than (70 years), the two side of the face are effected the same frequent, some cases are improve completely but other own permanent disfiguration with face weaken [12]. The unfortunate prognostic aspects increased with age [9], hypertensive patients [13], weakening of the taste [14] painfully ear and widespread facial paralysis [15]. After affection with the disease the early 3days, electrical examination have no change include the muscle's face but the electrical action declination within (4-10days), about (90%) of the effected patients the excitability may be reserved with complete recover, the excitability will disappeared for (20%) of the effected patients complete recover [16].

The Bell's palsy have 2 types 1. upper motor neuron 2. lower motor neuron, the upper motor neuron involved contralateral lower part from the face and lower motor neuron included the ipsilateral part from the face [7].

The cortico-bulbar fiber originated by contralateral-cerebral half to supply the inferior part of face by nucleus in the pons of the contralateral part, while The cortico-bulbar fiber primarily from bi- cerebral part to supply the superior part of face by nucleus in the pons of the contralateral part. The uni-lateral effected

area in cortex or cortico-bulbar fiber introduce paralysis in face “contra-lateral voluntary central” but that don’t suspected salivary, lacrimal gland or test sensation [17]. The paralysis of expression in muscle of face or weak causes by lesion in ipsi-lateral nucleus or nerve of the pons area [17].

The physical property of the effected person with the disease during examination suffered from weakness of muscle, facial paralysis, can’t control of the muscle, expression of face pull to right sides during speech and the patients can’t full closed the eye also the patient enable to blink and loose forehead wrinkle and the face became asymmetrical [18].

2. THE CLINICAL FEATURES OF BELL’S PALSY

The clinical features of Bell’s Palsy start with uni-lateral Lower Motor Neuron paralysis “ipsi-lateral side” in superior, inferior part of the face acutely, during “ 48-72 hours” convoyed pain in multiple part such as neck, ear and mastoid, change with mouth sensation also hyper-acusis [7] characteristic features are including the forehead of the patient wrinkling, can’t closed the eye or blink, the patients try closed eyelid eyeball moves toward upper that lead pupil will cover, white sclera become detectible “Bell’s sign” [19]. The lip ruck up, the corner of the mouth move upward, the naso-labial folds obliterated, weakness of buccinator muscles that lead to the food stay in labial, buccal vestibule in upper and lower jaw, half of face drooped causes of expression altered severely occur like mask [20]. The chorda tympani neuron involved that reason the anterior(2/3) from the tongue lost sensation of the test and diminishing of saliva, (20) hyper-acusis anther symptom suffered the patient destroy of stapedius muscle due to parasympathetic complaint and may occur paresthesia in the face [21].

3. CLINICAL EXAMINATION AND DIAGNOSIS

During checking and information taking from the patients that aided to determine the structure that effected with the disease and the changing in facial expression like asymmetry, paralysis [22]. The diagnosis by ophthalmological, neurological, ear examination involved the dermatology and parotid gland [23] Examination involve the expression and movement of the face such as ask the patient to move forehead “wrinkling” that

test for the temporal neuron, puffing the face, ask to close the eye be quiet that test for the mandibular neuron and also told the patient to smile “symmetry or not” the eye screwed up that exam for zygomatic neuron, nose with or without wrinkling for exam buccal neuron. This evaluation done by House/Brackmann-grading system which have (6 grades) started by first grade with no symptom to sixth grade with completely paralysis [24].

Bell’s Palsy patients exam the strength of the Orbicularis Oculi muscle by try to open and close eyes, move his eyes up-down ward, laterally medially. The examiner made test for pure tone, speech and brainstem evoked audiometry and ruled out retro-cochlear and cochlear area that exam help to confined which branch of facial neuron effected. Also The examiner can implement quinces prognosis by testing to saliva, drop of tears, stapedial reflex and sense of taste another exam which the electro-diagnostic(within 14 days) test showing the deep of damaged part, the result from diagnosis of the disease clinically caused the uni-lateral paralysis of the face [25]. The most of patients are effected by Bell’s Palsy like demyelinated disorder, stroke, tumor in parotid gland, cholesteatoma, Lyme diseases, inflammation in middle ear, granulomatous disorders, ramsay-hunt syndrome, diabetes mellitus and may be trauma [26,27]. The examiner record information taken from patients fill survey to face, neck and otology as well as radiologic examination another test done of the blood involved“ total count, blood smear, sugar serology and erythrocyte sedimentation rate” for determination which branch effected by such as stroke causes central or peripheral paralysis [28]. The clinical symptom is peripheral paralysis included the eyelid partial closed, loose of wrinkling forehead, eyebrows sagged, naso-labial fold is flatted and corner of the mouth is stooped. The excitability test to the nerve very important to record the prognosis, it’s made regular to find the degeneration of the nerve, done by recording the smallest charge electrical stimuli which can be cause contraction of the muscle detectible that lead to record excitation nerve threshold. It must be made to effected and non-effected part to compare the result if the different larger than “3.5 mA” that mean poor prognosis, radiographic Image and laboratory test done to record prognosis of the symptom after taking treatments (3weeks) if need return the treatments [29]. Magnetic Resonance Imaging is one of diagnostic test for Bell’s Palsy addition to history and clinical examinations, the

tympenic segment and vertical segment seen not specifically in control persons in Bell's Palsy occurred labyrinthine segment intensify [30].

4. TREATMENT AND THERAPY

Pharmaco-therapeutic, Surgical management aid to return nerve vitality and functions. the electro-diagnostic tests record action potential of effected muscle to estimate degree of axon damage. If the degree of axon degenerated more than (90%) must be treated by surgery, but when degeneration less amount that mean don't need surgery "favorable prognosis" [8].

For treating the Bell's Palsy very important to distinguish the reason of paralysis to get the best. The cure of facial neuron after affection depended on different factors, the patient himself and the degree of paralysis also the effect of drug given [31] Medications used for treatment as following:

4.1 Steroid Drugs

The most important drug used for facial nerve damaged when Inflammation appeared causes paralysis due to virus infection or physical stimuli [32]. The present of Inflammation causes of accumulation of edema which effect "direct indirect" on the nerve damaged and delay curing [33]. The steroid prevent action of "lipid peroxidation" to become stable membrane of the nerve and stimulate axon reformation. In recent time the publish Cochrane "review" improved effect of steroid in the disease frequently in facial neuron disorder [34].

4.2 Statins Drugs

It act to decreased level of blood cholesterol by raised lipoprotein(low-density) receptors expressed by inhibited "3-Hydroxy-3-Methylglutaryl Coenzyme A reductase" [35]. This drug maintaining Endothelial Nitric Oxide Synthase in vascular endothelial cell to prompt the growth of the cells by dilution of the blood vessel [36]. Anther effect is inhibited the cyclooxygenase-2 and myocyte infiltrated with reduction of secreted of metallo-proteinase and decreased the plaque weakness in the blood vessel [37].

4.3 Melatonin Hormones

Melatonin is one of important hormone that secreted form pineal gland nightly it act for

regulated of circadian cycle and minor amount release by gut, platelet, retina, bone marrow and skin. Also it acted to regulated immunity system, cells, blood pressure, hemostasis, antioxidant defenses and respiratory sequence [38]. Anther effect of melatonin by vasodilation through receptor in peripheral blood vessel [39].

4.4 Growth Hormones

One of important hormone secreted by pituitary gland, it act for growth of body by Insulin-like Growth Factor-1, the role of hormone is diminution of fatty masses, stimulation protein formed, growth of the bone and regulation level of glucose by metabolism of insulin. The action for blood vessels intensification oxygen in peripheral part of the body. Insulin-like Growth Factor-1 can be pass by Blood-Brain Barrier permit genesis of "neuron, synapse" and prevent nerves, cells from damaged by hypoxia or toxicity by chemical substance [40].

4.5 Carnitine L-Carnitine "Levocarnitine 3-Hydroxy-4-N-Trimethylaminobutyrate

The drug is made by the living body, it included "beta-oxidation" through passes fatty acid to reached mitochondria [41]. L-Carnitine do not used by the heart cells or muscles to formation myopathy or heart disorder [42]. Carnitine acting critical roles in keeping "acetyl-CoA ratio" within the cell, that aid preserve homeostasis through ischemia, exercises, stress acutely, and fasting [43].

4.6 Vitamin B12 (Cobalamin)

Cobalamin is very important vitamin "one of vitamin B complex" can't made by the body but gained by the digestion of food specially animal protein [44]. Cobalamin has critical roles in metabolism (monohydrates, fatty, proteins) and necessary for respiration of the cell [45].

4.7 Antiviral Agents

Acyclovir and Valacyclovir "Antiviral agents" act as typical drugs for Herpes Simplex virus and Varicella Zoster virus. Acyclovir pay role in acyclic "nucleoside and nucleotide analogs" which obstruct the genome of the virus within time of replicated, that done by DNA polymerase of the virus, but the Valacyclovir, famciclovir have "nucleic acid analogs" the same of acyclovir

which inhibition effect of DNA polymerase of virus [46,47].

5. NON-DRUG THERAPY BY PHYSICAL TREATMENT

Another therapy used for treatment of Bell's Palsy by exercise, massages, acupunctures to muscles or electrical, thermo-therapy stimuli to acceleration the healing but, no indication to gain positive results. The review of Cochrane very little evidence to increase function of affected part included "moderate, chronic paralysis patients". The exercise acts to decrease the healing time, long duration of palsy, the patient's number of chronic. The patients poor prognosis can be treated by surgery [48,49].

Within (6-8 weeks) the patients do not recover lead toward plastic's facial surgery to help close the eyes and analogous of the face, Asia tried for treated the patient by "Laser acupuncture" for acute cases, but chronic no clear result [50]. It's done to painful inflammation cases effected modality for insufficient healing from the disease [51].

6. DENTAL MANIFESTATIONS AND MANagements

Dental clinic involved with the patients have facial paralysis, that need special care during treatment. Bell's Palsy patients suffered with Orbicularis Oris dis-function which interfere with teeth brushing made poor hygiene of oral cavity, aggregation of "food debris, plaque" that make the patients more susceptible to caries and periodontitis [52]. To return oral hygiene needed continuous visit the dental clinic [52]. The edentulous cases may be recognized by bite his cheek, deviated of affected lower jaw toward normal side, the voice of different sound difficultly involved labio-dental fricative and bi-labial fricative [53] also to problems as loose his teeth, prosthesis as "face/lift device" and may be modified the denture "plumper" the prosthesis act to improve the strength of affected muscle, develop the esthetic and become constant for some cases [53] Bell's Palsy cases causes involuntary move the lower jaw, patients loose their teeth can't get normal function of lower jaw with little impulses to muscles [54]. The deviation of the lower jaw (shifting to right) reason for loose of the saliva from the corner of the mouth, some cases suffered from tear during the chewing {'crocodile/tears'}, uncontrolled moved of the

corner within blinking, while the mandibular opened ipsi-lateral eye closes {'jaw/winking'}. Synkinesis, contracture, spasm of the face can get treatment by "botulinum toxin" injections [55].

Surgery treatment "Ortho-gnathic" may be used for improve muscle disorder related to Bell's Palsy, that needed for (0.10% -0.75%) which slow or no response to treatment [56].

7. CONCLUSION

With the use of a history, clinical, radiologic examination, blood tests that assist decide the best medications for therapy, and a crucial nerve excitability test for recording prognosis, this study aims to identify the signs of Bell's Palsy, it is common to identify nerve degeneration, therefore it is crucial to assess which medications will promote neuron regeneration and alter treatments to ensure minimal side effects. Physical therapy should also be changed to hasten healing. Dental management for this patient by motivation of them to maintain oral hygiene and modification dental treatment to return mastication of food, brushing, whistling and using dental prosthesis to restore facial function. Also, aid the patient's psychological state in gaining inspiration to battle the illness and recover.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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