

# PREDNISOLONE VERSUS PREDNISOLONE COMBINED WITH ACYCLOVIR FOR THE TREATMENT OF BELL'S PALSY: A COMPARATIVE STUDY IN PERIPHERAL REFERRAL CENTRE

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## ABSTRACT

### Introduction

Bell's palsy is an idiopathic facial nerve palsy of sudden onset, usually, unilateral. Recent evidence suggests association of Herpes simplex infection with Bell's palsy but exact cause is unknown. Prednisolone are widely used in the treatment of Bell's palsy. However, the efficacy of additional treatment with acyclovir is uncertain.

### Objective

To evaluate whether a prednisolone with acyclovir provide a better degree of facial muscle recovery outcomes than prednisolone alone in patient with Bell's palsy.

### Methodology

This is a hospital based longitudinal cross sectional study conducted in Birat Medical College and Teaching Hospital and Birat Hospital PVT LTD, Biratnagar, Nepal from January 2017 to May 2018. A total of 42 patient diagnosed with Bell's palsy are included in this study, where 21 patient are treated with prednisolone and remaining 21 patient treated with a combination of prednisolone and acyclovir. The House-Brackmann grading scale is used for recording the initial presentation of patient with Bell's palsy and their early recovery on follow-up visit. The collected data was analysed using SPSS 18.0.

### Results

The total number of patients included in this study was 42. Mean age of patients is 27.1±10 years. Among them 25 (59.5%) were male and 17(40.5%) were female where male and female ratio is 1.5:1. Prednisolone plus acyclovir given in combination in Bell's palsy patients has as 76.2% recovery while prednisolone given alone has a 57.1% recovery P value <0.195, odds ratio 2.400 (95% confidence interval 0.638 – 9.028).

### Conclusions

Prednisolone and acyclovir, the combined therapy is effective than prednisolone alone in the treatment of Bell's palsy. It requires confirmation with randomized controlled trial.

## KEYWORDS

Acyclovir, bell's palsy, prednisolone



## INTRODUCTION

Bell's palsy is named after the British physician Sir Charles Bell, who described the onset, physical findings, and course of the disease in 1821.<sup>1</sup> The incidence rate of 20 per 100,000 per year and equal in both genders. Bell's palsy can occur at any age but the median age is 40 and both sides may be affected equally.<sup>2</sup> Bell's palsy is defined as an idiopathic, sudden onset peripheral facial nerve palsy.<sup>3</sup>

The exact causes of Bell's palsy remains unclear, although ischaemic neuropathy, viral infection usually herpes simplex virus, and autoimmune disorders like sarcoidosis are proposed as a causes of Bell's palsy.<sup>4</sup>

The pathophysiology of Bell's palsy involves inflammation and compression of seventh cranial nerve around the area where it exists the skull via stylomastoid foramen. The facial nerve travels through the fallopian canal and then enters the parotid gland where it divides into five terminal branches that are responsible for innervating the muscles of facial expression. The oedema and inability to expand beyond the inelastic bony fallopian canal leads to pressure effect and demyelination of axon, resulting in weakness or paralysis of everything that it innervates.<sup>5</sup>

Many viruses including Herpes simplex virus type 1 (HSV-1), Herpes simplex virus type 2 (HSV-2), Human herpes virus, Varicella zoster virus (VZV), Adeno virus, influenza B virus, Coxsackie virus and Epstein-Barr virus (EBV) have been linked to the development of Bell's palsy but it is believed that HSV-1 is the one that is responsible for idiopathic facial palsy.<sup>6</sup> HSV may remains latent at the geniculate ganglia and increasing evidence implies that Bell's palsy is caused by the latent HSV being reactivated from the cranial nerve ganglion and causes inflammation of facial nerve.<sup>7,8,9</sup>

The majority of patients with Bell's palsy recover completely without intervention. Complete recovery typically occur within 6 months. Approximately 30% of patients do not recover completely and gets residual symptoms such as contracture, synkinesis and paresis.<sup>10</sup>

Due to its unknown etiology, treatment of Bell's palsy remains controversial, frequently debated and variable. Steroid and antiviral are main two types of pharmacological treatment that have been used for Bell's palsy.<sup>3</sup> The rationale for these treatment is based on the presumed pathophysiology of Bell's palsy, the use of steroids to counteract the inflammatory process and antivirals is aimed at eradication of virus such as HSV-1, antiviral therapy seems logical.<sup>4,11</sup>

Most surgeon would advocate a combination of steroid and antiviral drugs. The usual recommended regime is oral prednisolone 1mg/kg/day for 7 days followed by ten days taper and oral acyclovir 200- 400mg 5 times daily for 7 days.

## METHODOLOGY

This is a hospital based longitudinal cross sectional study. A total of 42 patient diagnosed with Bell's palsy who visited OPD of Otorhinolaryngology of Birat Medical College and Teaching Hospital and Birat Hospital PVT LTD, Biratnagar, Nepal from January 2017 to May 2018 are included in this study. The permission to conduct this study was taken from the institution. All patient with Bell's palsy age of more than 10 years and of either sex were enrolled in the study.

All patients were randomly divided into two group. The first Group A of 21 patient were treated with prednisolone and remaining Group B of 21 patient were treated with a combination of prednisolone and acyclovir. In Group A oral prednisolone 1mg/kg/day was given for 7 days followed by ten days taper and Group B were treated with a combination of oral prednisolone 1mg/kg/day and oral acyclovir 400mg five times per day for 7 days.

Patient with facial palsy due to Ramsey Hunt syndrome, chronic suppurative otitis media, systemic infection, vasculopathy, secondary causes of 7<sup>th</sup> nerve palsy, sensitivity to acyclovir, Bell's palsy with >3 days of symptom onset, other cranial nerve paralysis, patients who are lost to follow up are excluded.

The House-Brackmann grading scale was used for recording the initial presentation of patient with Bell's palsy and their recovery on follow-up visit.<sup>12</sup> Follow-up was done after 7 days, 14 days and at the end of first month. Based on the House – Brackmann criteria, complete recovery is grade 1, no response grade 6 and partial facial muscle recovery defined at least as grade 2.

This is therefore the comparative study on recovery outcomes in patients with Bell's palsy treated either with prednisolone alone or with a combination of prednisolone and acyclovir.

## RESULT

The total number of patients included in this study was 42. Mean age of patients is 27.1±10 years. Highest proportion of patients were of age group 41-50 years (33.3%), followed by 10-20 years (26.2%), 21-30 years (21.4%), 31-40 years (16.7%) and 51-60 years (2.4%). Among them 25 (59.5%) were male and 17(40.5%) were female where male and female ratio is 1.5:1. Prednisolone plus acyclovir given in combination in Bell's palsy patients has as 76.2% recovery while prednisolone given alone has a 57.1% recovery P value <0.195, odds ratio 2.400 (95% confidence interval 0.638 –

**Table 1:** Age wise distribution among study population with Bell's palsy

Age distribution	Number of patients	Percent
10-20 years	11	26.2
21-30 years	9	21.4
31-40 years	7	16.7
41-50 years	14	33.3
51-60 years	1	2.4

**Table 2:** Gender distribution among study population with Bell's palsy

Gender	Number of patients	Percent
Male	25	59.5
Female	17	40.5



**Table 3:** Grading of severity of Bell's palsy based on House-brackman scale among study population

House-brackmann scale	Number of patients	Percent
gradeIII(moderate dysfunction)	3	7.1
gradeIV(moderately severe dysfunction)	37	88.1
gradeV(severe dysfunction)	2	4.8

**Table 4:** Recovery pattern following prednisolone (Group A) and combined prednisolone with acyclovir (Group B) intake in patients having Bell's palsy

	Group A	Group B	P – Value
Complete	12(57.1%)	16(76.2%)	
Partial	9(42.9%)	5(23.8%)	<0.195
No response	0(0%)	0(0%)	

## DISCUSSION

Viral etiology is the most likely cause of Bell's palsy, numerous studies have identified Herpes simplex virus (HSV 1) as the causative agent, and it has been found in patients who have undergone decompression for Bell's palsy.<sup>10</sup> Reactivation of latent HSV from the cranial nerve ganglion causes inflammation of facial nerve.<sup>7,8,9</sup> Murakami et al in 1996 explored the link between HSV and Bell's palsy. Viral genomes of HSV 1 were analyzed in clinical samples of facial nerve endoneurial fluid using polymerase chain reaction (PCR). HSV 1 genomes were detected in 11 of 14 patients (79%) with Bell's palsy.<sup>13</sup> HSV-1 has been detected on fresh and stored geniculate ganglions of temporal bone on polymerase chain reaction (PCR) assays.<sup>14,15,16</sup>

The treatment of the patients with Bell's palsy depends on a number of variables. Steroid treatment has been shown to be effective in many studies of patient with Bell's palsy.<sup>17,18</sup> However adding antiviral drugs to the treatment of Bell's palsy is to eradicate the virus while steroid reduced swelling and inflammation of nerve.<sup>19</sup> Use of an antiviral agent in addition to steroid in the treatment of Bell's palsy has been shown to improve the recovery of facial function when compared to corticosteroid treatment alone.<sup>20,21</sup>

Kawaguchi et al. showed that the recovery rate in patients with combination of prednisolone and valacyclovir were significantly greater than prednisolone alone.<sup>7</sup> de Almeida JR et al suggested that combination of antiviral and glucocorticoid treatment reduced risk of unfavourable recovery as compared with glucocorticoid treatment alone.<sup>22</sup> Lockhart P et al showed that treatment with antiviral agents alone were unsatisfactory, while the combination of corticosteroid and acyclovir therapy were significantly better.<sup>20</sup> Hato et al study, which reported a significant benefit of adding valaciclovir and showed that the benefit of valaciclovir was greater in patients with severe facial paralysis at presentation than in those with moderate paralysis.<sup>23</sup> Minnerop et al performed a subgroup analysis of patients who presented with severe facial

muscle paralysis (House-Brackmann grade of 5 or 6) and found significantly better recovery in patients who received famciclovir plus steroids than in those on steroids alone (72% v 47%, respectively, achieved normal function).<sup>24</sup>

In a double blind, placebo-controlled, randomized study, early treatment with prednisolone significantly improved Bell's palsy. However, no significant advantage was found for acyclovir alone or in combination with prednisolone.<sup>25</sup> Steroids are effective in patients whose Bell's palsy is started recently, and that antiviral therapy does not significantly improved the facial nerve function.<sup>26</sup> The recovery rate with combination therapy increases only slightly as compared to treating with prednisolone alone, according to Numthavaj et al Prednisolone is the basis of Bell's palsy treatment.<sup>27</sup>

On the other hand, one of the most recently published trials, by Engstrom et al, is in opposition to this argument. Patients in this trial had a median House-Brackmann grade of 4 at presentation, and the authors convincingly showed no benefit of adding valaciclovir to steroids.<sup>28</sup>

However, other studies that underestimate the efficacy of treatment by adding acyclovir. In our study though the response seems to be better with combined acyclovir and the prednisolone over prednisolone alone, the difference was found to be statistically insignificant.

## CONCLUSION

The combination therapy of prednisolone along with acyclovir is found to be better than prednisolone alone yet statistically insignificant. For the confirmation of the finding we recommend a randomized controlled trial with larger sample size.

## RECOMMENDATION

The study recommends the combined therapy of prednisolone and acyclovir as the effective treatment for Bell's palsy.

## LIMITATION OF THE STUDY

In this study sample size was small therefore multicentre studies with large sample size are required.

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## CONFLICT OF INTEREST

None

## FINANCIAL DISCLOSURE

None



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