

Meta-analysis Comparing Botulinum Toxin and Microvascular Decompression for the Treatment of Hemifacial Spasm

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UPMC LIFE CHANGING MEDICINE



Introduction

Hemifacial spasm (HFS) is a movement disorder characterized by involuntary spasms of the facial muscles. Spasms typically begin in the orbicularis oculi with eventual spread to other ipsilateral muscles innervated by the facial nerve. HFS is a debilitating condition leading to decreased quality of life (QOL). Both botulinum toxin (BTX) and microvascular decompression (MVD) have proven to be effective in treating the symptoms of HFS. Our objective was to conduct a meta-analysis comparing outcomes of both treatments.

Methods

Literature searches were conducted using two sources: the National Library of Medicine's PubMed search engine and the Cochrane Central Register of Controlled Trials. The bibliographies of relevant papers were also searched for additional references. Searches included the concepts of hemifacial spasm, surgical therapy, drug therapy, clinical outcomes, quality of life outcomes, and quality of life assessment. Review articles, commentaries, case reports and articles not in English were excluded. A total of 84 articles were included in the review. Data recorded included QOL measures as well as measures of treatment efficacy and complications.

Intervention	Study	Design	No. of pts	Time to FU	Outcomes
BTX	HFS36	Pro	103	6-8wks	Mean HFS36 score improved from 108.7 to 34.9.
BTX	HFS30	Pro	26	24wks	Mean HFS30 score improved from 34.2 to 21.8.
BTX	HFS30	Pro	30	4-6wks	Mean HFS30 score improved from 33.3 to 25.01.
BTX	HFS7	Pro	72	6-8wks	Mean HFS7 score improved from 12.4 to 7.38.
BTX	HFS36	Pro	85	2wks	Mean HFS36 score improved from 48.0 to 28.6.
MVD	HFS7, HFS8	Retro	25	3 wks	Median HFS7 and HFS8 scores improved from 12.6 and 11.8, respectively to 0 and 0.
MVD	HFS7, HFS8	Retro	20	17 mos	Mean HFS7 and HFS8 scores improved from 11.1 and 10.2, respectively, to 2.2 and 1.95.
MVD	HFS7, HFS8	Retro	60	71 mos	Median HFS7 and HFS8 scores improved from 8.1 and 8.4, respectively, to 0 and 0.
MVD	HFS7, HFS8	Retro	209	40 mos	Mean HFS7 and HFS8 scores improved from 16.36 and 18.23, respectively to 1.55 and 1.79.

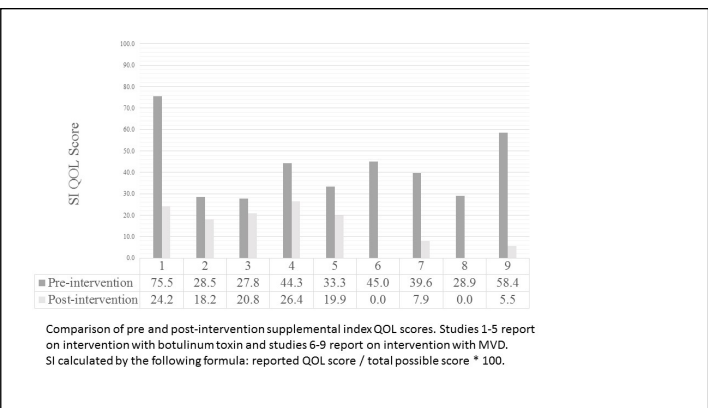
BTX, botulinum toxin; FU, follow-up; HFS, hemifacial spasm; MVD, microvascular decompression; mos, months; pts, patients; Pro, prospective; QOL, quality of life; Retro, retrospective; wks, weeks.

Rates of complications following MVD for HFS				
	Percent of pts (%)	95%CI	p-value	I ²
permanent facial weakness	1.0	0.0-1.0	<0.001	0.70
transient facial weakness	6.0	4.0-9.0	<0.001	0.96
delayed permanent facial weakness	1.0	0.0-2.0	<0.001	0.88
delayed transient facial weakness	7.0	5.0-8.0	<0.001	0.80
permanent hearing loss	3.0	2.0-4.0	<0.001	0.88
transient hearing loss	4.0	2.0-5.0	<0.001	0.90
permanent hoarseness	0.0	0.0-1.0	<0.001	0.60
transient hoarseness	2.0	1.0-4.0	<0.001	0.90

95%CI, 95% Confidence Interval; HFS, hemifacial spasm; MVD, microvascular decompression; pts, patients.
p-value, measure for heterogeneity
I², the variation in estimate attributable to heterogeneity

Results

Reviewed articles included 53 and 31 full texts reporting outcomes of HFS following treatment with MVD and BTX, respectively. Of patients undergoing MVD for HFS, 90% (95% CI 88-91, p<0.001, I²=0.91) experienced a complete recovery of symptoms while the mean peak improvement of symptoms following treatment with BTX was 77% (95% CI=74-81, p=0.380, I²=0.06). Patients undergoing MVD reported a greater improvement in QOL measurements as well as better post-intervention QOL scores in comparison with patients receiving BTX therapy. Patients receiving BTX were more likely to experience complications occurring in 16% (95% CI=8-25, p<0.001, I²=0.83) of all injections. All permanent complications following MVD had reported rates of 1% or less except for permanent hearing loss occurring at a rate of 3% (95% CI=2.0-4.0, p<0.001, I²=0.88).



Conclusions

Well-selected patients undergoing MVD may experience better response to treatment and, subsequently, better QOL as measured by disease specific QOL scales in comparison to patients receiving BTX.

Learning Objectives

By the conclusion of this session, participants should: 1) Know the rates of efficacy and complications of botulinum toxin and microvascular decompression for the treatment of hemifacial spasm, 2) Discuss the risks and benefits of each treatment option that influence patient decisions, 3) Discuss the possible benefits to quality of life of patients who undergo microvascular decompression.

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