Injectable Materials For Facial Paralysis: A Systematic Review and Meta-Analysis

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Introduction

Facial paralysis, a condition characterized by the weakening of facial muscles, presents a multifaceted challenge that profoundly impacts the quality of life for patients afflicted by it. The disfigurement and loss of expressive capabilities resulting from this condition can lead to social and emotional distress, affecting an individual's self-esteem. This highlights the pressing need for effective interventions that can not only restore facial function but also enhance overall well-being and confidence in these patients.

Innovative, low-cost, and accessible approaches have gained prominence as potential solutions to address both the functional and cosmetic aspects of this challenging condition. Within this context, the use of facial injectables such as neuromodulators and fillers have emerged as a potential office-based procedure that can enhance facial symmetry and improve quality of life. By using neuromodulators such as Botox (BTXA) to treat ipsilateral synkinesis and contralateral compensatory hyperkinesis and using fillers such as hyaluronic acid (HA) to enhance facial contours, we can treat facial paralysis effectively.

Objective

This review aims to evaluate the current literature regarding the application of injectables in the context of facial paralysis. Our objective is to critically evaluate the efficacy and practicality of office-based, and thus accessible, treatments for facial paralysis, shedding light on its potential as a valuable therapeutic option within the realm of facial paralysis treatment while also potentially identifying gaps in the current body of literature.

Methods

To complete the systematic review, we utilized databases: Pubmed, Embase, and Web Of Science. All missing standard deviations were completed using the RevMan Calculator. All *p* values that were missing were inferred based on sampling analysis.
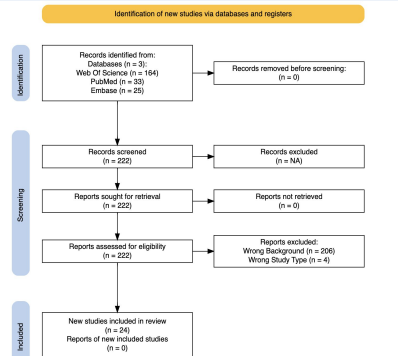

Figure 1. PRIMSA diagram illustrating systematic review methodology.

Search Strategy: (((((((((((((peripheral facial nerve paralysis) OR peripheral facial nerve palsy) OR peripheral facial paralysis) OR facial paralysis) OR peripheral facial palsy) OR facial palsy) OR Facial Asymmetry) OR Hemifacial Spasm) OR Ipsilateral Synkinesis) OR Contralateral Synkinesis) OR Spasm) OR facial Spasm) AND ((((hyaluronic acid) OR facial fillers) OR injectables) OR hyaluronic acid fillers)) AND ((((Facial symmetry) OR Myomodulation) OR Management))

Results

Authors	Year	Type Of Study	Number of Patients	Outcomes
Sahan	2017	Case Report	1	Improved from manuscript
Lee	2022	Prospective Cohort	28	VAS, FACE-Q, Complications
Occhiogrosso	2020	Prospective Cohort	20	FACE-Q
Borodic	1992	Prospective Cohort	6	Increase in all domains and vertical palpebral distance and corneal LRMD
Mancini	2009	Retrospective	9	Lagophthalmos, Exposure keratopathy
Haykal	2015	Retrospective	18	Facial analysis software
Lee	2015	Prospective Cohort	17	Sunnybrook
Armstrong	1996	Prospective Cohort	24	Improved from manuscript
Borodic	2005	Prospective Cohort	36	Corneal LRMD when smiling, puckering, chewing, Vertical palpebral distance when smiling, puckering, chewing, domain scores, Physician grading scale
Mehta	2008	Prospective Cohort	66	FACE-Q
Filipo	2012	Prospective Cohort	41	Sunnybrook, SASAQ
Chua	2004	Prospective Cohort	5	Complications, Recurrence
de Maio M	2007	Prospective Cohort	18	Direct 3D measurements
Salles	2009	Prospective Cohort	25	Clinical Score, EMG, FDI
McElhinny E.R.	2013	Prospective Cohort	16	MRD1, subjective
Choi	2013	Prospective Cohort	42	Improved from manuscript
Wiener	2011	Case Report	1	Improved from manuscript
Kanemo M.	2021	Prospective Cohort	83	Biting cheek, complications from facial paralysis
Shinn JR	2019	Prospective Cohort	99	SAQ
Toffola	2009	Prospective Cohort	30	SFGS
Dall'Angelo, A	2014	Retrospective	69	SFGS, subjective platysmal evaluation
Jin Kim	2013	Prospective Cohort	18	SFGS, HB
Akulov MA	2017	Prospective Trial	76	House-Brackmann, Yanagihara System and Sunnybrook Facial Grading scale, and Facial Disability Index self-assessment

Table 1. Included papers utilized in the study that include number of patients, type of study, and recorded outcomes.

Overall

- There were a total of 748 patients in this systematic review
- Most outcomes were reported using FACE-Q, SFSG, and SASAQ.

FACE-Q

- Two papers discussed using the FACE-Q scale (Figure 2).
- There was not heterogeneity within these studies; Q (p-val > 0.05)
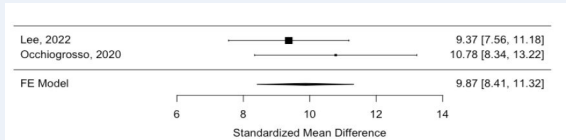- There was one study by Mehta who utilized a different form of FACE-Q.

Figure 2. Forest plot of studies using injectables to treat facial paralysis that evaluated FACE-Q.

SFSG (SunnyBrook Facial Grading Scale)

- Three papers discussed using the SFSG scale with BTXA (Figure 2).
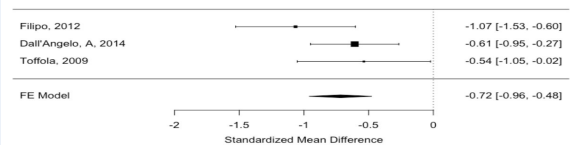- There was not heterogeneity within these studies; Q (p-val > 0.05)

Results

Figure 3. Forest plot of studies using injectables to treat facial paralysis that evaluated SFSG.

SASAQ (Synkinesis Assessment Questionnaire)

- Two papers discussed using the SASAQ scale with BTXA (Figure 2).
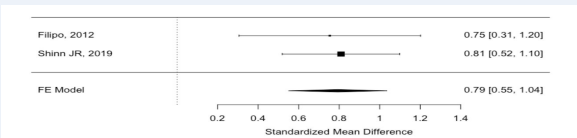- There was not heterogeneity within these studies; Q (p-val > 0.05).

Figure 4. Forest plot of studies using injectables to treat facial paralysis that evaluated SASAQ.

Conclusions

Our systematic review demonstrates that injectables and office-based approaches such as botox and dermal filler are objectively effective options for the treatment of facial asymmetry following facial paralysis. There were also meaningful improvements in patients' psychosocial distress. There is a need for higher power, universal and objective level studies that should aim to optimize treatment paradigms.

Limitations

- Papers analyzing changes in SFSG or FACE-Q after injectables did not report results with standard deviation (SD).
  - As such, the power of the systematic review was limited.
- Different follow-up periods make long term prognostication difficult to interpret.

References

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