

Role of Botulinum Toxin Type A
In Management of Vocal Fold Contact Granuloma

Meta-Analysis Study
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Presented By

Wael Abdelrahman Elsayed Sobih

M.B., B.CH - 2009

High Degree ENT Diploma - 2015

Faculty of Medicine – Ain-Shams University

Supervised By

Prof. Dr.Ahmed Adly Mohamed

Professor of Otorhinolaryngology

Faculty of Medicine, Ain-Shams University

Prof. Dr. Amr Nabil Rabie

Professor of Otorhinolaryngology

Faculty of Medicine, Ain-Shams University

Dr. Marwa Mohamed ElBegermy

Assistant - Professor of Otorhinolaryngology

Faculty of Medicine, Ain-Shams University

Faculty of Medicine
Ain Shams University

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قَالُوا سُبْحَانَكَ
لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا
إِنَّكَ أَنْتَ
الْعَلِيمُ الْحَكِيمُ

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CONTENTS

Subject	Page
INTRODUCTION	1
AIM OF THE WORK	4
REVIEW OF LITERATURE	5
▪ Vocal Fold Anatomy	5
▪ Laryngeal contact granulomas	13
▪ Management of vocal folds contact granulomas	26
MATERIALS AND METHODS	43
RESULTS	49
DISCUSSION	80
CONCLUSION and LIMITATIONS	87
ENGLISH SUMMARY	88
REFERENCES	91
ARABIC SUMMARY	105

LIST OF TABLES

No	Table	Page
1	Proposed causes for contact granuloma	17
2	Symptoms of vocal folds contact granuloma	22
3	Differential diagnosis of arytenoid granuloma	25
4	Management of vocal process granuloma	26
5	Summary of excluded papers	50
6	Data collected from articles included in the Meta-analysis.	52
7	Meta-analysis for the incidence of hoarseness of voice	53
8	Meta-analysis for the incidence of dysphagia	56
9	Meta-analysis for the incidence of local pain	59
10	Meta-analysis for the incidence of fluid aspiration	62
11	Meta-analysis for the incidence of decreased valsalva effort	65
12	Meta-analysis for the rate of complete response	68
13	Meta-analysis for the rate of improvement	71
14	Meta-analysis for the failure rate	74
15	Meta-analysis for the relapse rate	77

LIST OF FIGURES

No	Figure	Page
1	Laryngoscopic view of interior of larynx	6
2	Vocal folds(open)	7
3	Vocal folds(speaking)	8
4	Normal vocal fold functions	9
5	Intrinsic muscles of the larynx	10
6	Cut section in the vocal folds showing microscopic picture	11
7	Vocal process granuloma	14
8	Post-intubation granulomas of the larynx	15
9	Molecular Structure of Botulinum toxin type A	37
10	mode of action of BoTs	38
11	Injection of botulinum toxin percutaneously via the cricothyroid membrane into the vocal fold	40
12	Botulinum toxin A injection sites within the larynx	41
13	Forest plot for the incidence of hoarseness of voice	54
14	Funnel plot for the incidence of hoarseness of voice	55
15	Forest plot for the incidence of dysphagia	57
16	Funnel plot for the incidence of dysphagia	58
17	Forest plot for the incidence local pain	60
18	Funnel plot for the incidence local pain	61
19	Forest plot for the incidence of fluid aspiration	63
20	Funnel plot for the incidence of fluid aspiration	64
21	Forest plot for the incidence of decreased valsalva effect	66
22	Funnel plot for the incidence of decreased valsalva effect	67
23	Forest plot for the rate of complete response	69
24	Funnel plot for the rate of complete response	70
25	Forest plot for the rate of improvement	72
26	Funnel plot for the rate of improvement	73
27	Forest plot for the failure rate	75
28	Forest plot for the failure rate	76
29	Forest plot for the relapse rate	78
30	Funnel plot for the relapse rate	79

LIST OF ABBREVIATIONS

BoTs	Botulinum toxins
BTA	Botulinum toxin type A
GERD	Gastroesophageal reflux disease
GHL	Global Health Library
HC	Heavy chain
HSDI	High-speed digital imaging
kDa	Kilodalton
LC	Light chain
LPR	Laryngeopharyngeal reflux
NYAM	New York Academy of Medicine
RCTs	Randomized-controlled trials
SNAP-25	Sensitive attachment protein 25
VFGs	Virtual Health Library
VHL	Vocal fold granulomas

Abstract

Background: Granulomas of the vocal process of the larynx are benign lesions of the posterior glottis generally centered over the tips of the cartilaginous vocal processes. Clinically they are associated with odynophagia, throat clearing, globus, and otalgia.

Aim of the Work: This meta-analysis study aimed to analyze the role of botulinum toxin type A in management of vocal fold contact granuloma. **Materials and Methods:** The study strictly followed the recommendation of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. It was done in the following steps: Target determination, identification the location of articles, screening and evaluation, data collection, data analysis and finally reporting and interpretation.

Results: There was acceptable complete response rate of contact granuloma to botulinum toxin injection with event rate of 85.422% while rate of improvement among selected cases was 92.962%. Concerning to complications the most common complication was hoarseness of voice with rate of 52.737% while dysphagia was 21.125% among cases.

Conclusion: Botulinum toxin is a safe and effective therapy in resolving vocal process granulomas. Descriptive analysis showed an 85% complete response, 92.9% improvement rate, with only 5.4% relapse rate and 7% failure rate. Post injection decreased Valsalva effort was 0.16%. While we didn't reach a reliable outcome regarding temporary post injection hoarseness of voice, dysphagia, local pain at injection sites and fluid aspiration.

Key words: Botulinum toxin type A, vocal fold contact granuloma



Introduction



Introduction

Vocal fold granulomas (VFGs) are areas of chronic inflammation, usually located near the vocal process of the arytenoids caused by a variety of conditions such as intubation, gastroesophageal reflux disease, and vocal abuse (*Nelson and Schweinfurth, 2012*).

Management of VFGs remains a controversial topic for the laryngologist and head and neck surgeon. Their etiology varies, treatment is difficult, and there is a high recurrence rate. They were first described as “contact ulcers” in 1928 by Jackson G (1928) who reported a superficial ulceration along the posterior aspect of the larynx. At that time their etiology was thought to be voice abuse. Further application of endotracheal intubation led to a theory that VFGs can be a result of trauma secondary to prolonged intubation. Since then, several other factors have been implicated in their etiology including voice abuse and gastroesophageal reflux disease (GERD). Although these lesions are rare, recurrence rates of up to 90% have proven their management to be challenging (*Karkos et al., 2014*).

The ENT surgeon is often the first specialist consulted by a patient with a voice disorder. More than half of these patients will have benign vocal fold changes and their treatment is often a combination of conservative and interventional measures. To this end, ENT surgeons with an interest in voice disorders rarely work alone, and a multidisciplinary team consisting of, amongst others, speech and

language therapists allows for the best possible patient care (*Bohlender, 2013*).

Botulinum toxin, one of the most poisonous biological substances known, which is a neurotoxin produced by the bacterium *Clostridium botulinum*. *C. Botulinum* elaborates eight antigenically distinguishable exotoxins (A, B, C₁, C₂, D, E, F and G). All serotypes interfere with neural transmission by blocking the release of acetylcholine, the principal neurotransmitter at the neuromuscular junction, causing muscle paralysis. The weakness induced by injection with botulinum toxin A usually lasts about three months. Botulinum toxins now play a very significant role in the management of a wide variety of medical conditions, especially strabismus and focal dystonias, hemifacial spasm, and various spastic movement disorders, headaches, hypersalivation, hyperhidrosis, and some chronic conditions that respond only partially to medical treatment (*Nigam F and Nigam JK 2010*) .

In 1995, *Nasri et al. (1995)* introduced a new therapy in the treatment of laryngeal granulomas, Botulinum toxin type A was injected into one or both vocal folds to induce temporary vocal fold paresis allowing resolution of granulomas. The injectable sites are thyroarytenoid muscle, lateral cricoarytenoid muscle, interarytenoid Muscle and aryepiglottic muscle.

The success of this therapy was confirmed by ***Orloff LA and Goldman SN (1999)*** who noted resolution of granulomas in eight patients treated with botulinum toxin although voice therapy and anti-reflux therapy probably play significant roles in the overall treatment of laryngeal granulomas, the recovery period enabled by the paresis may be essential in order to prevent rapid recurrence.



Aim of the Work



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This meta-analysis study aimed to analyze the role of botulinum toxin type A in management of vocal fold contact granuloma.