Role of Botulinum Toxin Type A

In Management of Vocal Fold Contact Granuloma

Meta-Analysis Study
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Master Degree in Otorhinolaryngology
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
لاَ عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا
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Wael Sobih

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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 hoarsness 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 hoarsness of voice, dysphagia, local pain at injection sites and fluid aspiration.

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

Introduction

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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, C_1, C_2, 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.