Screening of Oropharyngeal Dysphagia in Patients with Diabetes Mellitus in El-Demerdash Hospital

Thesis

Submitted for the partial fulfillment of the requirement of Master Degree in Phoniatrics

By

Donia Ayman Zakaria

M.B., B.Ch.

Resident of Phoniatrics, Faculty of Medicine, Ain Shams University

Supervised by

Prof. Dr. Marwa Mahmoud Saleh

Professor of Phoniatrics

Faculty of Medicine - Ain Shams University

Dr. Meram Mohamed Bekhet

Assistant Professor of Endocrinology

Faculty of Medicine - Ain Shams University

Dr. Mona Sameeh Khodeir

Lecturer of Phoniatrics

Faculty of Medicine - Ain Shams University

Faculty of Medicine

Ain Shams University

2017

*First, All our thanks are to **Allah** for blessing this work till it has reached its end as a part of his generous help throughout my life.*

*I would like to express my deepest gratitude and appreciation to **Prof. Dr. Marwa Mahmoud Saleh,** Professor of Phoniatrics, Faculty of Medicine, Ain Shams University for the great support and encouragement she gave me, and for giving me the honor of working under her supervision.*

*I would like to express special thanks to **Dr. Meram Mohamed Bekhet,** Assistant Professor of Endocrinology, Faculty of Medicine, Ain Shams University for her faithful supervision, precious help and continuous support throughout this work.*

*I would like to express my sincere appreciation to **Dr. Mona Sameeh Khodeir**, Lecturer of Phoniatrics, Faculty of Medicine, Ain Shams University for her valuable supervision, generosity and continuous guidance throughout this work.*

*Finally, I would like to thank **my family** for their great efforts and support throughout this work and my whole life.*

Donia Ayman Zakaria

List of Contents

List of Abbreviations

ACTH	:	Adrenocorticotropic hormone
ADH	:	Anti-diuretic hormone
A-DHI	:	Arabic version of Dysphagia Handicap Index
BSA	:	Bedside Swallowing Assessment
CP	:	Cricopharyngeus muscle
CVD	:	Cardiovascular disease
DHI	:	Dysphagia Handicap Index
DM	:	Diabetes Mellitus
EAT-10	:	Eating Assessment Tool-10
FSH	:	Follicle-stimulating hormone
GAD	:	Glutamic Acid Decarboxylase
GH	:	Growth hormone
HS	:	Highly significant
IC	:	Inferior constrictor muscle
LES	:	Lower esophageal sphincter
LH	:	Luteinizing hormone
M.D.ADI	:	M.D. Anderson Dysphagia Inventory
MEN	:	Multiple endocrine neoplasia
NS	:	Non-significant
PC	:	Personal computer
S	:	Significant
SOAL	:	Swallowing outcome after total laryngectomy questionnaire
SSA	:	Standardized Swallowing Assessment
SSQ	:	Sydney Swallow Questionnaire

List of Abbreviations (Cont.)

SWAL-QOL	:	Swallowing related quality of life
TOR-BSST	:	Toronto Bedside Swallowing Screening Test
TSH	:	Thyroid-stimulating hormone
UES	:	Upper esophageal sphincter
VAS	:	Visual analogue scale

List of Tables

List of Figures

Introduction

Dysphagia is the medical term that is used to describe the difficulty of swallowing and the feeling of difficulty in passage of solids or semisolids or liquids from the mouth to the stomach ***(Smithard et al., 2007 and Brady, 2008).***

Justice (2006) stated that dysphagia is not a disease, but rather a symptom that results from an underlying etiology or cause. Dysphagia is classified in the clinical settings according to the extent of oral, pharyngeal or esophageal phase deficits into ***Oropharyngeal dysphagia and Esophageal dysphagia***.

Oropharyngeal dysphagia describes the difficulty to start a swallow in one of the 3 phases; the oral preparatory, oral voluntary and the pharyngeal phases. This may cause food to enter the larynx and lead to choking, coughing, or even aspiration pneumonia. This is typically felt in the region of the back of the throat ***(Gyawali, 2010)***. ***Esophageal dysphagia*** describes the feeling of food being stuck in neck or chest and this occurs with diseases that involve the esophagus ***(Gyawali,* 2010).**

Oropharyngeal dysphagia can result from different types of damage to the central nervous system (damage may be due to injury of the cortex, spinal cord or due to degenerative neurological disorders) or damage to the structures of the oral cavity, pharynx and larynx. Also, treatment of head and neck cancer by using either radiation

or surgery often results in significant changes in the swallowing mechanism ***(Falk and Katzka, 2016; Kahrilas and Pandolfino, 2016).***

Wise and Murray (2006) stated that there are systemic diseases that may cause dysphagia such as:

- Connective tissue diseases such as scleroderma and systemic lupus erythematosus.
- Infectious diseases such as Chagas' disease.
- Inflammatory diseases such as sarcoidosis.
- Endocrinal diseases such as diabetes mellitus.

Few tools have been developed to assess the patient's perception of his/her dysphagia-related problems in terms of quality of life, emotional and psychosocial effects. Some of these questionnaires are:

- **Eating Assessment Tool (EAT-10)** is a tool used to measure the swallowing problems. It is also validated in the Arabic language by ***Farahat and Mosallem (2015)*** and called the validated Arabic version of Eating Assessment Tool (EAT-10) for Arab speaking patients with oropharyngeal dysphagia ***(Farahat and Mosallem, 2015).***

- **The swallowing related quality of life (SWAL-QOL)** was developed by ***McHorney et al. (2000)*** as a patient-based dysphagia-specific tool to evaluate the impact of swallowing problems on the quality of life in patients with dysphagia.

- **M.D. Anderson Dysphagia Inventory (MDADI)** is the first validated questionnaire that is designed specifically to assess the effect of dysphagia on quality of life of patients with head/neck cancer ***(Chen et al., 2001).***

- **Dysphagia Handicap Index (DHI)** is a validated and standardized English questionnaire that describes the handicapping effect of dysphagia on emotional, functional, and physical aspects of individual's lives ***(Farahat et al., 2014).***

Diabetes mellitus is a systemic endocrinal disease that results either from deficiency of insulin hormone (type 1) or from insulin resistance or both (type 2) ***(Dattani and Gevers, 2016)***. The pathophysiology of the oropharyngeal dysphagia in diabetics is still not completely clear. However, the autonomic neuropathy associated with long term hyperglycemia is claimed to be the cause. ***Restivo et al. (2006)*** reported that dysphagia in diabetic patients is due to hyperactivity of the cricopharyngeus muscle of the upper esophageal sphincter as the coordination between the pharyngeal inferior constrictor and cricopharyngeus muscle is impaired.

Questions arise about oropharyngeal dysphagia in diabetes; its prevalence, whether it is related more to diabetes type 1 or type 2, or duration of diabetes. Literature is scarce related to dysphagia with diabetes. This complaint is expressed by some patients and needs to be explored.

Aim of the Work

The aim of this work is to screen Egyptian diabetic patients (type 1 and type 2) in El-Demerdash hospital for oropharyngeal dysphagia.

Anatomy and Physiology of Swallowing

Swallowing process is the successful passage of food and drinks from the mouth to the stomach. It is a continuous process of deglutition from placement of the food in the mouth, its manipulation in the oral cavity, and its passage through the oral cavity, pharynx, and esophagus until it enters the stomach. It is a complex process involving the muscular and neurological systems ***(Matsuo and Palmer, 2008; Shaker et al., 2013).***

Anatomical structures involved in the swallowing process:

1. **The oral cavity:** including *the outer vestibule* (lips and oral vestibule) and *the inner oral cavity proper* (teeth, tongue, cheeks, hard palate and soft palate).

2. **The pharynx.**
3. **The larynx.**
4. **The esophagus.**

1. The oral cavity:

The oral cavity is the initial site for the food processing. It extends from the lips to the pharynx. The oral cavity is divided by the dental arches (formed by the teeth and alveoli) into two parts: *the outer vestibule* (lips and oral vestibule) and *the inner oral cavity proper* (teeth, tongue, cheeks, hard palate and soft palate) together with the jaw and the tempro-mandibular joint.

Structures inside the oral cavity are:

The oral vestibule:

The oral vestibule is the part of the oral cavity lying between the dental arches and the deep surfaces of the cheeks and lips. It is lined by mucous membrane. The parotid duct and the labial, buccal, and molar glands open into the oral vestibule. Anteriorly, it communicates exteriorly via the oral fissure and posteriorly with the oral cavity proper ***(Matsuo and Palmer, 2008; Shaker et al., 2013)***.

Lips:

The lips surround the oral fissure and are composed of the orbicularis oris muscle ***(figure, 1)*** and sub mucosa (containing mucous labial glands, labial vessels, nerves and fatty tissues). They are lined externally by skin and internally by mucous membrane. Lips ensure good lip closure; preventing oral contents from leaking out of the mouth by the action of the orbicularis oris muscle during the oral preparatory phase ***(Gray, 2008; Drake et al., 2009).*** Orbicularis oris muscle is a complex of muscles in the lips that encircles the mouth. It was misinterpreted as a circular muscle, but it is now recognized that the muscle actually consists of four substantially independent quadrants that interlace and give only an appearance of circularity (upper, lower, left and right) ***(Standring, 2008).***

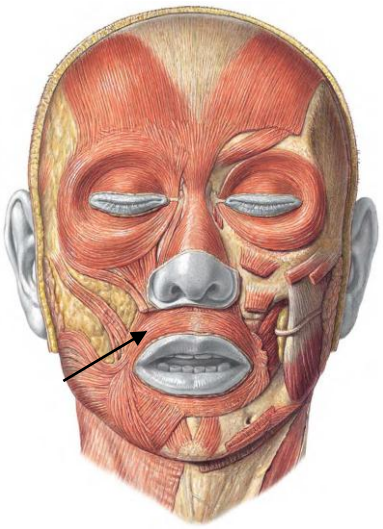

Figure (1): Orbicularis oris muscle (arrow) ***(Standring, 2008)***

Cheeks:

The cheeks form the lateral walls of the oral cavity and are continuous with the lips at the nasolabial sulcus. Each cheek is composed of skin, superficial fascia, parotid duct, mucous buccal and molar glands, vessels, nerves, lymphatics, fat, submucosa, and mucosa. Cheeks provide counter force to the tongue to facilitate proper bolus control and prevent accumulation of food in the lateral sulci by the action of buccinator muscle during the oral preparatory phase ***(Gray, 2008; Drake et al., 2009).***The buccinator ***(figure, 2)*** is a thin quadrilateral muscle, occupying the interval between the maxilla and the mandible at the side of the face. It forms the anterior part of the cheek or the lateral wall of the oral cavity ***(Standring, 2008).***