

Original Article

Prevalence of dysphagia in patients with head and neck cancer at dental clinic, Hospital USM

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Abstract Prevalence of dysphagia is one of the important epidemiological data which will contribute to the proper planning and support the setting up of a swallowing rehabilitation clinic at this hospital. The present study aimed to determine the prevalence of dysphagia in patients with head and neck cancer (HNC) at Hospital Universiti Sains Malaysia (Hospital USM) from 2001-2010. In this institutional retrospective study, a total of 66 records were obtained comprising of 86.4% Malay patients, 9.1% Chinese, 1.5% Indians, and 3% other ethnic groups. These data were taken from the database of HNC patients seen at the dental clinic, Hospital USM between 2001 and 2010. Difficulty swallowing, frequent coughing during meal, choking, diet modification, and non-oral nutritional support were identified as signs and symptoms associated with dysphagia. Results showed that 59.1% of patients have had dysphagia before, during, or after the treatment of HNC. Data from the present study would be instrumental in increasing awareness among clinicians involved in patient care and it may help in planning the outline of management of dysphagia. Furthermore, it is anticipated to have implications for further research in swallowing and dysphagia.

Keywords: dysphagia, head and neck cancer, prevalence, swallowing.

Introduction

One of the significant morbidities of head and neck cancer (HNC) treatment is swallowing impairment or dysphagia; the severity of which is linked to anxiety, depression, and a compromised quality of life (Nguyen *et al.*, 2005). Swallowing is a complex process that requires the coordination of multiple muscles and nerves. One or more phases in swallowing may be affected by radiation and/or surgical therapy. The definition of a swallowing disorder is any disruption in bolus passage from the oral cavity to the stomach; while dysphagia is defined as a patient's complaint or symptom of an underlying swallowing disorder. The tumour may contribute to swallowing difficulty in some patients before any treatment commences. On the other hand, a patient's ability to swallow becomes the main issue after HNC treatment. Therefore, it is necessary to assess swallowing function thoroughly at

various intervals throughout the cancer treatment because the onset and chronicity of swallowing problems have an immense effect to the patient's quality of life (Vu *et al.*, 2008).

HNCs have an incidence of 1,852 per 100,000 populations in Malaysia (National Cancer Registry, 2006). The prevalence of dysphagia in HNC population has been established as 50.6% for a hospital in Spain (García-Peris *et al.*, 2007). However, there is no data regarding the prevalence of dysphagia in HNC patients in Malaysia. The prevalence of dysphagia in patients with other illnesses has been established for the West Coast of Peninsular of Malaysia but not in the East Coast region. Those studies evaluated dysphagia in patients with stroke, supraglottic carcinoma (a type of HNC), or gastro-oesophageal reflux disease (GERD). Hamidon *et al.* (2006) reported that 41% of their patients had dysphagia following acute ischemic stroke in a study at Hospital Universiti Kebangsaan Malaysia (HUKM),

while 33% of patients with supraglottic carcinoma had dysphagia in a study by Sani *et al.* (1992) at Hospital Kuala Lumpur (HKL) and HUKM. In another study, 7.3% of patients with GERD had dysphagia at University Hospital of Kuala Lumpur (UHKL) (Mahadeva *et al.*, 2005).

The management of HNC should employ a multidisciplinary approach as technical means and support services from various disciplines are important for a successful treatment outcome (Shah and Gil, 2009). Dental care is essential in providing preventive and therapeutic care to oncology patients before commencement of chemotherapy, radiotherapy, or other medical treatments (Walsh, 2010). As such, the management of dysphagia has not been outlined at Hospital Universiti Sains Malaysia (Hospital USM), Kubang Kerian, Kelantan, probably due to lack of awareness regarding dysphagia in clinicians who attend to the patients, as have been reported by a study carried out by a speech pathologist student at USM (Yong, 2014), or lack of personnel treating this problem. Furthermore, no data on the prevalence of dysphagia has been established, which may hinder the setting up of a dedicated dysphagia clinic. Thus, this retrospective study seeks to determine the prevalence of dysphagia, particularly in patients with HNC attending the dental clinic at Hospital USM, to promote the setting up of a multidisciplinary dysphagia clinic. Hopefully, the data can increase awareness in clinicians, thus increasing referrals to the dysphagia clinic at Hospital USM. It is also anticipated that this information will have implications for further research on swallowing rehabilitation in the future.

Materials and methods

Study design

This was an institutional retrospective study of the prevalence of dysphagia in patients with HNC treated between 2001 and 2010 at Hospital USM. The present study was approved by The Research and Ethics Committee of School of Medical Sciences, Universiti Sains Malaysia (Ref. No.: USM/KK/PPP/JEPeM [247.4.(2.10)]).

Population and sampling

The source population included all patients with HNC seen at the dental clinic, Hospital USM between 2001 and 2010.

Sampling frame

Inclusion criteria were adult patients aged 18 years and above diagnosed with HNC between 2001 and 2010. Dysphagia associated with tumour, surgery, or adjuvant therapy was all considered. The criteria for dysphagia were: (i) difficulty in swallowing or no oral intake, (ii) frequent choking and excessive coughing during mealtime, (iii) need for a diet modification, (iv) need for non-oral nutritional support, (v) need for individual mealtime supervision and/or (vi) history of aspiration pneumonia (Groher and Bukatman, 1986).

Research tools and data collection

The existing HNC database at The School of Dental Sciences, USM was explored for patients with signs and symptoms of dysphagia. Medical and dental records of these patients were taken out for further inspection. A data collection form was designed, adapted from that used by Winstein (1983). The information obtained from the records was: (i) patients' demographic profile and related medical history, (ii) patients' complain of any symptoms related to dysphagia, (iii) clinicians' report of any signs related to dysphagia, and (iv) management of the disease and its outcome. The form used to manage data collection is shown in Fig. 1.

Statistical analyses

Data were analysed using SPSS version 20.0. All quantitative and qualitative data were expressed as percentage.

Results

Sixty-six records of head and neck cancer patients were included in the present study. The demographic data for the patients showed that 3.0% of them were less than 21 years old, 7.6% were between 21 to 40 years old, 33.3% between 41 to 60 years old, 48.5% between 61 to 80 years old, and 7.6% patients were more than 80 years old. Among the subjects,

60.6% were male and 39.4% were female. These patients were then grouped according to the site of origin of the cancer diagnosed (Table 1) and type of the head and neck cancer (Table 2).

From the total number of patients with head and neck cancer studied, 39 or 59.1% of patients presented with dysphagia which occurred before, during, or after the treatment. Among the 39 patients with dysphagia, 56.4% of them were recorded to have onset of dysphagia during medical treatment, 23.1% after surgery, 5.1% after chemotherapy, 7.7% after radiotherapy, and another 7.7% was of unknown onset.

Only 4.5% of patients with head and neck cancer presented with aspiration pneumonia with 1.5% of them having experienced aspiration pneumonia once, 1.5% twice, and another 1.5% several times.

For the assessment of feeding type, 51.5% (34 patients) were dependent on non-oral feeding. Out of this number, 82.9% of them were using nasogastric tube, 11.4% had gastrostomy, and 5.7% were using parenteral route as their mode of feeding.

As a consequence of dysphagia, diet modification was prescribed to cater to each individual's feeding needs. Out of the 66 patients studied, 50.0% took pureed food, 33.3% took mashed food, and 9.1% were still able to take whole food. The diet of 7.6% of the patients was not recorded. There were no records of patients taking ground food, chopped food, or cut-up food. As for liquid consumption, 13.6% of the patients can only tolerate thin liquids whereas 1.5% nectar-like liquids.

Discussion

The study on prevalence of dysphagia in HNC patients was undertaken because no known previous study of this kind has been conducted in Hospital USM before. Layne *et al.* (1989) stated that early identification of the dysphagic patient is a key component of assessment and treatment. Unfortunately, many swallowing problems go undetected until severe consequences develop; for example, malnutrition, aspiration

pneumonia, and airway obstruction. Presently, at Hospital USM, the managing team is not treating the symptoms of dysphagia as it was not recorded as an illness. Even though it is not an illness, a symptom, once recognised, should be treated accordingly. Many consequences of dysphagia, which may be avoided if treated early, develop in these patients as the swallowing disorders were left untreated.

The term HNC covers a large number of neoplasms, including tumours of the oral cavity, pharynx, larynx, sinuses, salivary glands, thyroid, soft tissue, as well as bone tumours and skin cancers (Shah and Gil, 2009). Based on this definition, HNC would also include cases which may not have been referred to the dental clinic; thus, data from the present study may be underreported as it lacks cases of nasopharyngeal, larynx, and neck cancers. These types of cancer may have some form of dysphagia associated with them, either from surgery or xerostomia post-radiotherapy.

Among the HNC patients, the commonest site of oral cancer origin was from the tongue. The tongue is an important structure involved in swallowing. Loss of tongue, albeit a minor portion, may lead to defective bolus formation and transportation, thus causing swallowing difficulty to patients. The prevalence of dysphagia is higher in patients with total glossectomy due to the role of the tongue in the oral phase of swallowing; it being indispensable to bolus propulsion and correct mastication (García-Peris *et al.*, 2007).

Nearly 60% of patients from the present study were recorded as having swallowing problems. García-Peris *et al.* (2007) noted that patients with dysphagia presented a higher impairment in their quality of life (QOL) than those without swallowing problems. Thus, to avoid patients living with impaired QOL, dysphagia should be identified early and managed accordingly.

The onset of dysphagia differs for every patient, depending on the course of treatment. The result showed that the onset of dysphagia was highest during

medical course of treatment followed by after surgery. García-Peris *et al.* (2007) stated that patients treated with radiotherapy or chemoradiotherapy had increased prevalence of dysphagia than patients without co-adjuvant treatment.

More than half of the HNC patients have diet modification. Their diet was modified due to various causes; difficulty in swallowing being the major cause. García-Peris *et al.* (2007) mentioned that dysphagia did not significantly affect nutritional status, probably because these patients developed adaptive eating mechanisms. This behavioural adaptation explains the higher percentage of diet modification compared to the percentage of patients with dysphagia.

Nasogastric tube served as the commonest type of feeding in HNC patients. Murphy and Gilbert (2009) stated that although patients may receive adequate nutrition via a feeding tube, there were many negative aspects of tube feeding that impact on patients and their families: (i) tube feedings are expensive and may not be covered by insurance, (ii) feedings are time intensive and may require disruptions in the patients' activity, and (iii) minor complications are frequent. Thus, further intervention by multidisciplinary approaches may provide better choices to improve swallowing in these patients, such that they may not have to rely on tube feeding.

Studies show a high prevalence of aspiration following chemoradiation for head and neck cancers. Many of the patients had 'silent aspiration'; that is, aspiration which is not associated with coughing. This probably occurred due to sensory loss associated with severe mucosal and submucosal damage to the laryngeal inlet area. These patients have a high risk of contracting pneumonia, and the lack of a cough reflex precludes their identification during clinical follow-up. As a consequence, aspiration is underreported in the literature. Diagnostic studies such as modified barium swallow (MBS) should be part of the investigations done in patients to monitor the severity of dysphagia, to assess for aspiration, and to plan for swallowing rehabilitation (Nguyen *et al.*,

2006). We presume this is the case with our study as only 4.5% were reported to experience aspiration pneumonia. MBS is not a routine investigation performed here as no protocol for dysphagia management has been established. It is crucial to identify aspiration in patients with dysphagia and treated accordingly as aspiration pneumonia could be fatal.

One of the limitations of the present study was the sample size. The existing HNC database from The School of Dental Sciences, USM consisted of only 93 patients. However, due to some records which have been discarded, lost, or cannot be retrieved, the remaining sample size was 66 and all of these records were included in the study. Another limitation of the present study was that it reflects the experience of cancer patients at only one clinic in one institution (Hospital USM), where patients may also be attending other clinics such as the otorhinolaryngology clinic, general surgery clinic, and plastic and reconstructive clinic. Thus, the sample is not reflective of the country as a whole. Other limitations that need to be addressed are the retrospective nature of the study and poor records on presentation of dysphagia in HNC patients by the medical personnel. If we were able to increase clinicians' awareness regarding dysphagia, the record keeping on the signs and symptoms of dysphagia may be improved.

In future studies of dysphagia in HNC patients, a larger sample size should be employed and modalities such as modified barium swallow utilised to assess patients' swallowing function. It should be a cross-sectional study where data were collected while patients were undergoing treatment. Early intervention with regard to swallowing rehabilitation could be simultaneously carried out and the progress of dysphagia can be monitored throughout treatment to obtain a better treatment outcome. All members of the multidisciplinary team managing patients with HNC should be trained to compose proper records of patients' swallowing experience and make the necessary referrals to the dysphagia clinic for patients who require swallowing rehabilitation.

Table 1: Distribution of patients according to site of origin of the cancer diagnosed (n = 66)

Site of origin	Frequency	Percentage (%)
Maxilla and palate	6	9.1
Mandible	4	6.1
Tongue	25	37.9
Floor of mouth	6	9.1
Lip	3	4.5
Parotid gland	1	1.5
Buccal mucosa	3	4.5
More than one site in oral cavity	11	16.7
More than one site beyond oral cavity	7	10.6
Total	66	100.0

Table 2: Distribution of patients according to type of head and neck cancer diagnosed (n = 66)

Type of cancer	Frequency	Percentage (%)
Squamous cell carcinoma	51	77.3
Mucoepidermoid carcinoma	3	4.5
Lymphoma	2	3.0
Adenoid cystic carcinoma	2	3.0
Nasopharyngeal carcinoma	2	3.0
Others	6	9.1
Total	66	100.0

Demographic Data

Registration number:

Date of birth (dd/mm/yyyy):

Age:

Sex: Male Female

Ethnic: Malay Chinese Indian Others: _____

Occupation: _____

Household income: RM 1000 RM 1001-3000 RM 3001-5000
 RM 5001-7000 RM 7001-10000 > RM10000

Marital status: Single Married Divorced Widowed

Education level: None Primary Secondary Tertiary

Medical History

Weight: _____ kg Height: _____ m BMI: _____ (kg/m²)

Admission date (dd/mm/yyyy):

Discharged date (dd/mm/yyyy):

Tumour site: _____

Tumour type: _____

Complaint of dysphagia: No Yes _____

Sign(s) of dysphagia: No Yes _____

Date dysphagia was present or diagnosed: _____

History of aspiration pneumonia: No Yes (Once / twice / thrice / many times)

Diet

Feeding: Oral Non-oral (Nasogastric tube / gastrostomy / parenteral)

Diet modification: Pureed Mashed food Ground food
 Chopped food Cut-up food Whole food (unmodified)

Liquids: Thin Nectar-like Honey-like Spoon-thick

Management

Surgery (type & date performed): _____

Radiotherapy: _____

Combination of surgery and radiotherapy: _____

Chemotherapy: _____

Treatment status: _____

Figure 1: The data collection form (Adapted from Winstein, 1983)

Conclusion

More than half of the HNC patients develop dysphagia with the commonest site of HNC at the tongue. Dysphagia most probably occurred during the course of medical treatment. Although most of these patients have diet modification after they were diagnosed with HNC, dysphagia may not be significant, as some patients may develop adaptive eating mechanism to cater to their feeding needs. Proper recording of the signs and symptoms of dysphagia and referral for further intervention should be adopted to improve the QOL in these patients.

References

- García-Peris P, Parón L, Velasco C, de la Cuerda C, Cambor M, Bretón I *et al.* (2007). Long-term prevalence of oropharyngeal dysphagia in head and neck cancer patients: Impact on quality of life. *Clin Nutr*, **26**(6): 710-717.
- Groher ME, Bukatman R (1986). The prevalence of swallowing disorders in two teaching hospitals. *Dysphagia*, **1**(1): 3-6.
- Hamidon BB, Nabil I, Raymond AA (2006). Risk factors and outcome of dysphagia after an acute ischaemic stroke. *Med J Malaysia*, **61**(5): 553-557.
- Layne KA, Losinski DS, Zenner PM, Ament JA (1989). Using the Fleming index of dysphagia to establish prevalence. *Dysphagia*, **4**(1): 39-42.
- Mahadeva S, Raman MC, Ford AC, Follows M, Axon ATR, Goh KL, Moayyedi P (2005). Gastro-oesophageal reflux is more prevalent in Western dyspeptics: a prospective comparison of British and South-East Asian patients with dyspepsia. *Aliment Pharmacol Ther*, **21**(12): 1483-1490.
- Murphy BA, Gilbert J (2009). Dysphagia in head and neck cancer patients treated with radiation: assessment, sequelae, and rehabilitation. *Semin Radiat Oncol*, **19**(1): 35-42.
- National Cancer Registry MoHM. (2006). *Malaysian Cancer Statistics: Data and Figure for Peninsular Malaysia 2006*. National Cancer Registry, Ministry of Health Malaysia.
- Nguyen NP, Frank C, Moltz CC, Vos P, Smith HJ, Bhamidipati PV *et al.* (2006). Aspiration rate following chemoradiation for head and neck cancer: an underreported occurrence. *Radiother Oncol*, **80**(3): 302-306.
- Nguyen NP, Frank C, Moltz CC, Vos P, Smith HJ, Karlsson U *et al.* (2005). Impact of dysphagia on quality of life after treatment of head-and-neck cancer. *Int J Radiat Oncol Biol Phys*, **61**(3): 772-778.
- Sani A, Said H, Lokman S (1992). Carcinoma of the larynx in Malaysia. *Med J Malaysia*, **47**(4): 297-302.
- Shah JP, Gil Z (2009). Current concepts in management of oral cancer- surgery. *Oral Oncol*, **45**(4-5): 394-401.
- Vu KN, Day TA, Gillespie MB, Martin-Harris B, Sinha D, Stuart RK, Sharma AK (2008). Proximal esophageal stenosis in head and neck cancer patients after total laryngectomy and radiation. *ORL J Otorhinolaryngol Relat Spec*, **70**(4): 229-235.
- Walsh LJ (2010). Clinical assessment and management of the oral environment in the oncology patient. *Aust Dent J*, **55**(Suppl 1): 66-77.
- Winstein CJ (1983). Neurogenic dysphagia. Frequency, progression, and outcome in adults following head injury. *Phys Ther*, **63**(12): 1992-1997.
- Yong XD (2014). *Levels of awareness, involvement and training in dysphagia management among medical officers*. Unpublished Bachelor of Health Science (Hons) thesis. Universiti Sains Malaysia.