Nutritional plan among cancer patients with dysphagia

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Abstract

Background: Dysphagia is defined as difficulty swallowing or inability to swallow. The complications of dysphagia include malnutrition, dehydration, chocking, aspiration pneumonia, low self-esteem, embarrassment, limited social activity, depression, anxiety, and loneliness, loss of taste / smell and death. Objectives: to assess role of nutritional plan and advices on dysphagia outcome. Materials and Methods: An interventional prospective cohort study had been done during the period from May 16 2023 to September 1 2023 at Ghazi Al-Hariri Hospital Surgical Specialties in the department of oral and maxillofacial surgery, Medical City. Baghdad, Iraq. The study consists of 100 patients with oral cancer suffering from dysphagia (50 with mild dysphagia and 50 with moderate dysphagia), nutritional assessment was done concentrating on body mass index(BMI), waist circumference(WC), % weight loss, and % usual body weight(%UBW) for interpreting weight changes and presence of cachexia. Biochemical analysis for Hb, blood electrolytes protein, albumin , lipid profile, and Hba1c. Nutritional plan regarding high calorie high protein diet and advices were given for them regarding proper positioning , time of meal and modify the texture of foods and/ or viscosity of liquids to encourage patient to meet adequate nutrition and hydration while elimination the risk of aspiration. After 6 weeks from nutritional plan and advices we were reassessed our participants for BMI, waist circumference, protein energy malnutrition by % weight loss, degree of malnutrition by % UBW , cachexia and biochemical analysis.
Results: the results showed that nutritional plan positively associated With improvement in malnutrition and cachexia, normalization of serum calcium, total serum protein, albumin, lipid profile, Hba1c and hemoglobin. Conclusions: Nutritional plan for cancer patients associated with improvement in malnutrition and cachexia, and even improvement of biochemical analysis, better control of diabetes and reduction of anemia.

Key Words: nutritional plan, cancer ,dysphagia

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INTRODUCTION

Dysphagia is defined as difficulty swallowing or inability to swallow. Can occur in all age groups, may be a result of many medical conditions, be an acute problem or progress slowly over a long period of time. It is estimated to affect 14%-18% of the world's population [1-3].

Dysphagia can be either mechanical obstruction which is caused by tumor or stricture, or functional dysphagia caused by neural or muscular disorders [4].

The complications of dysphagia include malnutrition, dehydration, chocking, aspiration pneumonia, low self-esteem, embarrassment, limited social activity, depression, anxiety, and loneliness, loss of taste / smell and death [5].
Despite these complications there are little studies on effects of nutritional plan in dysphagia patients , so our study aim to assess the effect of nutritional plan among patients with dysphagia due to oral cancer.

MATERIAL AND METHOD

An interventional prospective cohort study had been done during the period from May 16 2023 to September 1 2023 at Ghazi Al-Hariri Hospital Surgical Specialties in the department of oral and maxillofacial surgery, Medical City. Baghdad, Iraq.

The study consists of 100 patients with oral cancer suffering from dysphagia (50 with mild dysphagia and 50 with moderate dysphagia), nutritional assessment was done concentrating on body mass index(BMI), waist circumference(WC), % weight loss, and % usual body weight(%UBW) for interpreting weight changes and presence of cachexia.

Biochemical analysis for Hb, blood electrolytes , protein , albumin , lipid profile, and Hba1c.

Distinguishing between mild and moderate dysphagia by swallow test by which we ask the patient to swallow some water and a piece of pudding food and mechanically soft food, if he or she cannot swallow the mechanically soft food or swallow it with difficulty but easy with pudding food then it is moderate dysphagia , if he can do easily with mechanically soft diet it is mild dysphagia. In case of severe dysphagia even saliva was difficult to be swallowed [2,4,6].

Nutritional plan regarding high calorie high protein diet and advices were given for them regarding proper positioning , time of meal and modify the texture of foods and/ or viscosity of liquids to encourage patient to meet adequate nutrition and hydration while elimination the risk of aspiration by the following instructions[2,3,4]:

1. Serve small, frequent meals to maximize intake, advice patients to rest before meal time and postpone meal if the patient is fatigued

2. Reduce or eliminate distractions at mealtime so patient can focus his or her attention on swallowing and limit disruption and do not rush the patient (allow at least 30 minutes for eating).

3. If the patient had one sided facial weakness place the food on the other side of the mouth. Tilt the head forward to facilitate swallowing.

4. Teaching the patient how to make swallowing easy by leaning backward and pushing the food by pressure of syringe directly to the oropharynx.

5. Place the patient in an upright position and pelvis as a core base for support, trunk in the midline and position patient upright(90 degrees) for 30 minutes after meals with checking patient's mouth for pocketing of food or incomplete swallowing.

6. Counseling on techniques to improve acceptance by: providing a pleasant atmosphere for dinning, use variety of foods to improve acceptance by adding color, creating a calm atmosphere at meal time and slow down eating

7. Description of dysphagia pureed diet(very cohesive, pudding like, does not require chowing) for those with moderate dysphagia, mechanically altered diet(semisolid food, require chewing ability) for those with mild dysphagia .

8. Enhancing patient's protein and calorie intake with ensure formula, moreover giving the patient advices for food safety. When oral nutrition is inadequate, a trial for enteral nutrition was met.

9. Also advice for a tolerable exercise[2,4].BMI calculation by dividing weight in Kg over height in square meter. If the result <18.5 it is underweight, 18.5- 24.9 it is normal, 25 and above is overweight[1].

Waist circumference was considered normal if < 88 cm in females and < 102 cm in males, abdominal obesity if ≥ 88 cm , 102cm in female and male respectively[1].

% weight loss is calculating by dividing the amount of weight loss by the weight that the person generally maintains, so an unintentional weight loss of > 5% within three months or less or > 10% within 6 months suggests Protein Energy Malnutrition(PEM)[7].

To estimate % UBW by compare an individual's current weight with the usual weight by the following equation:

%UBW= current body weight/ usual body weight × 100, if the result was 85- 95 it is mild malnutrition , 75-84 moderate malnutrition ,< 75 severe malnutrition[8].

Cachexia was diagnosed when unintentional weight loss >5% in the last 6 months or BMI<20 along with presence of any 3 of the followings: fatigue, anorexia, decreased muscle strength and lab evidence of anemia(Hb< 12 g/ dl), hypoalbuminemia(<3.2 g/dl) or elevated markers of inflammation(e.g. IL-6 or CRP)[9].

S. Sodium was considered normal if 136 -145 mmol/I,<136 low and above 145 high[1,2,3].
S. Potassium was considered normal if 3.5-5.1 mmol/l,<3.5 low and above 5.1 high[1,2,3].
S. Chloride was considered normal if 98- 107 mmol/l, <98 low and >107 high[1,2,3]
S. Calcium was considered normal if 8.4-10.2 mg/dl, < 8.4 low and >10.2 high[1,2,3].
S. Protein was considered normal if 6.4- 8.3 g/dl, <6.4 low[1,2,3].
S. Albumin was considered normal if 3.5-5.2 g/l, < 3.5 low[1,2,3].
S. Cholesterol was considered normal if<200 mg/dl, high if≥200[1,2,3].
S. high density lipoprotein(HDL) cholesterol level was considered normal if 40-60 md/dl, <40 low[1,2,3].
S. low density lipoprotein(LDL) cholesterol level was considered normal if <100mg/dl, ≥ 100 was considered high[1,2,3].
S. Triglyceride level was considered normal if <150 mg/dl, ≥ 150 high[1,2,3].
Hba1c was considered normal if< 5.5%, 5.5%-<6.5% prediabetes, 6.5%-<7% controlled diabetes, ≥7% uncontrolled diabetes[1,2,3].
Hb level was considered normal if ≥12 g/L in female, if< 12 anemia and for male≥ 13g/L was considered normal, <13 anemia[1,2,3].
After 6 weeks from nutritional plan and advices we were reassessed our participants for BMI, waist circumference, protein energy malnutrition by % weight loss, degree of malnutrition by % UBW , cachexia and biochemical analysis.

RESULTS

A total of 100 participants were included in the study (50 with mild dysphagia and 50 with moderate dysphagia): 67% males and 33% females; their age was regarded 26- 77 years with mean age of 58.28.
There was a significant relationship between nutritional plan and body mass index as 52% of participants was in normal BMI in post plan in comparison to only 38% preplan, also decrease percentage of those with underweight from 18% to 3%. Furthermore there was a significant relationship between waist circumference and nutritional plan as increase in percentage of those with no abdominal obesity from 56% to 59% in post plan period. Moreover there was a significant relationship between nutritional plan and

protein energy malnutrition as increase in the percentage of no to mild malnutrition in the post plan period to 79% in comparison to only 47% in preplan. In addition to a significant relationship between nutritional plan and cachexia as decrease in cachexia percentage from 11% to 8% in the post plan . More details are shown in (Table 1 and 2).

Tab.1. Relationship between nutritional plan and anthropometric measurements

Variable	Nutritional plan		P
	Preplan	Post plan	
BMI			
Underweight	18(18)	3(3)	0.0001*
Normal	38(38)	52(52)	
≥ overweight	44(44)	45(45)	
WC			
Abdominal obesity	44(44)	41(41)	0.0001*
No abdominal obesity	56(56)	59(59)	
PEM			
No malnutrition	27(27)	38(38)	0.0001*
Mild malnutrition	20(20)	41(41)	
Moderate malnutrition	38(38)	21(21)	
Severe malnutrition	15(15)	0	
Cachexia			
Yes	11(11)	8(8)	0.0001*
No	89(89)	92(92)	

Tab. 2. effects of nutritional plan on biochemical analysis

Variable	Nutritional plan		P
	Preplan	Post plan	
S Sodium			
Normal	54(54)	98(98)	0.103
Hypernatremia	5(5)	0	
Hyponatremia	31(31)	2(2)	
S. potassium			
Normal	64(64)	97(97)	0.057

Hyperkalemia	1(1)	0	
hypokalemia	35(35)	3(3)	
S.chloride			
Normal	41(41)	91(91)	0.092
Hypochloremia	35(35)	3(3)	
Hyperchloremia	24(24)	6(6)	
S.Calcium			
Normal	83(83)	90(90)	0.0001*
hypocalcemia	17(17)	10(10)	
S.protein			
Normal	65(65)	90(90)	0,014*
Hypoproteinemia	35(35)	10(10)	
S. Albumin			
Normal	38(38)	75(75)	0.0001*
Hypoalbuminemia	62(62)	25(25)	
S. Cholesterol			
Normal	67(67)	93(93)	0.159
Hypercholesterolemia	33(33)	7(7)	
HDL cholesterol			
Normal	57(57)	89(89)	0.0001*
Low	43(43)	11(11)	
LDL cholesterol			
Normal	49(49)	77(77)	0.0001*
High	51(51)	23(23)	
S. Triglycerides			
Normal	74(74)	95(95)	0.0001*
High	26(26)	5(5)	
Hba1c			
Normal	78(78)	78(78)	0.0001*
Prediabetes	1(1)	9(9)	
Controlled diabetes	1(1)	8(8)	
Uncontrolled diabetes	20(20)	5(5)	
Hb			
Anemia	70(70)	25(25)	0.0001*
Normal	30930)	75(75)	

DISCUSSION

Dysphagia is defined as difficulty swallowing or inability to swallow. Dysphagia can be caused by oral cancer and lead to complications like xerostomia, malnutrition, dehydration, chocking, aspiration pneumonia, low self-esteem, embarrassment, limited social activity, depression, anxiety, loneliness, loss of taste/ smell and death, so nutritional plan had many benefits on dysphagia management[1,2,3,5,10].

This study showed increased percentage of normal body mass index and decrease percentage of underweight in the post plan in comparison to preplan period. These findings were compatible with that in the literature[11].

The finding of decrease abdominal obesity after nutritional plan was similar to that reported by other [12].

Nutritional plan impact protein energy malnutrition. This study showed that nutritional plan was significantly associated with improvement in malnutrition. It is consistent with that in the literature[13].

Nutritional plan negatively affect cachexia by decreasing in percentage of cachexia in our participants (P=0.0001), this was similar to the line literature [14]

Nutritional plan was associated with normal S. Calcium level(P=0.0001).It is in the line with published studies[15].

Nutritional plan was associated with normal serum protein and serum albumin (p=0.014, 0.0001) consequently. It was similar to published data[16].

Nutritional plan was associated with normalization of serum HDL, LDL and triglyceride level, this was compatible with a published data[17].

Nutritional plan was associated with improvement in Hba1c level , it is consistent with that in the literature[11,14,16].

Nutritional plan positively affected normalization of hemoglobin level((p=0.0001), this was similar to the line literature[17].

No impact for nutritional plan on serum sodium, potassium, chloride and cholesterol level, it is in contrast with published data[17]. The difference might explained by shortage in the period of follow up, difference in sampling and cultures.

CONCLUSION

Nutritional plan for cancer patients associated with improvement in malnutrition, decrease percentage of cachexia, and even improvement of biochemical analysis, better control of diabetes and reduction of anemia.

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CONFLICTS OF INTEREST

There are no conflicts of interest

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