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Integrating psychosocial support and nutritional interventions in laryngeal cancer care: Insights from a retrospective study

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Abstract: The aim of this study was to review 120 cases of laryngeal cancer at the Department of Ears, Nose, and Throat (ENT) from 2010 to 2015 and to summarize and discuss the related symptoms and psychological nursing experience of patients with laryngeal cancer. The accumulation of experience and the continuous improvement in nursing techniques have focused on the nutritional aspects and psychosocial support of patients with larynx cancer. Providing systematic, comprehensive and individualized psychological and nutritional nursing interventions is critical for laryngeal cancer patients, and will promote rehabilitation, improve long-term quality of life, and increase patient satisfaction.

Keywords: larynx cancer; nutritional disorders; psychological nursing intervention

1. Introduction

Laryngocarcinoma is the most common head and neck malignant tumor in the world, accounting for 5.7%–7.6% of all cancer cases. The incidence and mortality of laryngocarcinoma are second only to those of lung and bronchial cancers among amongrespiratory malignancies [1]. New cases of larynx cancer in China were expected to affect 26,400 people, with 14,500 deaths and an increasing trend [2].

As the sixth largest malignant tumor in the world, head and neck squamous cancer (HNSC) affects more than 600,000 people every year. Despite the great progress made by surgery, radiotherapy and chemotherapy in recent years, the overall survival of HNSC patients is still not high, with about 300,000 patients dying every year. The prognosis of HNSC patients largely depends on the stage of diagnosis [3]. Patients with metastasis or recurrence tend to have a poor prognosis, despite the addition of first-line antitumor drugs and immunotherapy. Patients with recurrent or metastatic HNSC still have a difficult overall survival for more than a year. Because of late diagnosis, low treatment reaction and high recurrence and metastasis rate, the 5-year survival rate for Head and neck squamous cell carcinoma (HNSCC) is around 50%, with little improvement in the past 20 years. Environmental pollution, especially in some developing countries, is an important contributor to the increasing incidence of laryngeal cancer. The pathogenesis of HNSCC is usually related to exposure to tobacco or excessive alcohol consumption. In addition, persistent infection with human papillomavirus (HPV) has become the third risk factor for the pathogenesis of HNSCC [4,5]. Common symptoms of laryngocarcinoma include hoarseness, dysphagia, trouble breathing, and lump in the neck [6]. The 5-year survival rate for

patients with laryngeal cancer at stages I and II is > 68% after surgical resection, while at stages III and IV the survival rate is only 40%–50%.

Immunotherapy has the characteristics of long-lasting efficacy, non-drug resistance and individualized precision targeted therapy, which mainly includes oncolytic virus, therapy, tumor vaccine therapy, cytokine therapy, monoclonal antibody therapy. But many problems have not been solved. Currently, the main treatment for laryngeal cancer is surgery with various surgical methods, including laryngoscope CO₂ laser resection, partial laryngectomy, and total laryngectomy. According to TNM (T: Tumor; N: Lymph node; M: Metastasis) stage, some patients must be treated with radiotherapy and chemotherapy. Because of the tumor location, the above treatment often leads to key changes in ventilation—loss of the structure and functional integrity of the digestive tract and difficulty in food intake, resulting in an inadequate intake of energy, protein and liquid and severely impairing the nutritional state of the body [7]. Simultaneously, a variety of complications from laryngeal carcinoma after treatment, the patients are experiencing the painful process, such as pain, dry mouth, sticky saliva, feeling ill and use of painkillers, language and voice impairment, particularly due to tracheostomy, cause different degrees of physiological and psychological burdens in patients; thus, their social life and working ability are limited, their quality of life decreases, and the complications influence a patient's food intake and patient selection [8,9]. Nutritional status is directly related to postoperative rehabilitation, functional recovery and long-term survival of laryngeal cancer patients. Meantime, they are more easily depressed, anxious, and suicidal. For patients with laryngeal cancer, psychological intervention is particularly necessary because of dramatic physical changes after surgery, such as loss of phonation, hyposmia, hypogeusia, and frequent coughing. In the present study, we implemented nursing care based on malnutrition-related symptoms as well as psychological intervention for patients with laryngeal cancer during hospitalization.

2. Materials and methods

All cases of larynx cancer were obtained from the patients at the Department of ENT of our hospital from 2010 to 2015. Inclusion criteria were age between 18 and 75 years, diagnosed with laryngeal cancer, suitable for the surgery, agreed to undergo psychotherapy after surgery, and had relatively complete clinical data. Exclusion criteria included no toleration of clinical surgery, or communication disorders/mental disorders combined with severe kidney liver or other organ diseases. We finally recruited 120 cases of larynx cancer. Written informed consent for research was obtained from each patient, and this study was approved by the Institutional Human Experiment and Ethics Committee of the Second Affiliated Hospital of Xi'an Jiaotong University. Among them, hemi-laryngectomy was performed in 77 patients (55 males and 22 females, 64.2%). Total laryngectomy plus functional neck dissection was performed in 43 patients (29 males and 14 females, 35.8%), with a mean age of 59 ± 1.2 years (range, 32–81 years). Meanwhile 53 patients were treated with chemotherapy and all the patients were treated with radiation. After treatment, 65% of the patients showed dysphagia symptoms, 13% had mucositis, 34% showed dry mouth symptoms, 57% had increased salivary function, 14% had nausea and vomiting, 49% had taste

and smell changes, and 31% had constipation after treatment. Moreover, 61% of the patients showed 2 or more malnutrition symptoms.

3. Symptoms of nutritional disorders

The key point in a nutritional intervention for patients with laryngeal cancer is to effectively cope with and improve the symptoms of malnutrition. Such symptoms include dysphagia, mucositis, dry mouth and abnormal taste [10]. The symptoms are mainly related to the location and size of the tumor, the methods of treatment and the complications and sequelae caused by the disease. These symptoms usually lead to reduced food intake and unconscious weight loss, which may cause variations in the nutritional status and serious damage to laryngeal cancer patients.

3.1. Dysphagia

Laryngeal surgery and high-intensity periodic chemoradiotherapy are the main causes of acute and chronic dysphagia in patients with laryngeal cancer. A clinical survey showed that the incidence of dysphagia in patients with laryngeal cancer was as high as 50% and that swallowing pain was often associated with radiation-induced oral mucositis [11,12]. Dysphagia and swallowing pain not only directly led to a decrease in oral intake but also led to prolonged eating time, thus resulting in a limited diet.

3.2. Oral mucositis

Treatment-related oral mucositis is very common in larynx patients treated with radiotherapy or radiotherapy combined with chemotherapy [13]. Oral mucositis caused by chemotherapy usually lasts for 3~12 days, but with radiotherapy, mucositis lasts for 3~12 weeks. Mucositis can directly cause pain, bleeding, infection, feeding disorders, nausea, vomiting and taste allergy. Mucositis causes significant pain in patients, affects eating and leads to physical weakness.

3.3. Oral drying

Xerostomia is a common complication of radiotherapy for patients with laryngeal cancer and may result in severe oral mucositis. High-dose radiation can directly damage the matrix, leading to fibrosis and nutrient vessel atresia of the parotid and submandibular glands, which will result in decreased salivary gland function. Oral drying can cause a series of related symptoms, including a burning sensation of the oral mucosa, effects on swallowing and verbal communication, dental caries, and a taste loss or change. Oral saliva is also susceptible to bacterial and fungal infections. Dry mouth disease often lasts for a long time and has a serious impact on the diet and quality of life of the patient [14].

3.4. Hyperhidrosis

Salivary gland mucosa changes with thick mucus and excessive secretion of saliva are more common in laryngeal carcinoma patients undergoing surgery and chemotherapy. Increased oral secretion is better, as with Santeria, but also causes inconvenience and pain to the patient. Excessive mucus can cause coughing, choking,

nausea, vomiting or gastroesophageal reflux, make it difficult for the body to obtain adequate water and nutrition.

3.5. Nausea and vomiting

Nausea and vomiting are common side effects of laryngeal cancer treatment. It includes gastrointestinal side effects of chemotherapeutic agents, radiosensitizers, excessive oral secretion and the adverse psychological reactions of patients.

3.6. Taste and olfactory changes

Taste and smell are two types of human senses [15]. These senses help people distinguish food, drive food intake and are important for maintaining the body's nutrition and health. Changes in taste and smell often lead to a decline in the pleasures of eating, a decline in appetite, and a decrease in food intake. A change in this sensation may be due to the invasion of the tumor itself and the side effects of treatment, such as sensory receptor cell injury, leukodystrophy, mucositis, and psychological and emotional effects [15]. Approximately 100% of larynx patients who received radiotherapy have symptoms of taste and smell changes. For example, the taste abnormality of laryngeal cancer usually occurs within a few days starting from the beginning of radiotherapy. For an irradiation dose greater than 20 Gy, the degree of taste damage increases exponentially. Patients who received chemotherapy often reported abnormal "metal", "bitter", and "chemical" smells and tastes. The patient's condition is mostly chronic, sometimes lasting several months to several years.

3.7. Constipation

Constipation refers to a decrease in the frequency of defecation due to various reasons (fewer than 3 defecations per week), dry stool and/or defecation difficulties (including defecation, effort, defecation, prolonged defecation and manual defecation) [16]. The use of an irregular diet and opioid analgesics has made constipation more common in patients with laryngeal cancer than in patients with other pathological types of tumors. More than 31% of patients with laryngeal cancer are troubled by constipation in our patients. Complications such as abdominal distention, abdominal pain, loss of appetite, nausea and vomiting, irritability and anxiety seriously affect the nutritional status, daily life and treatment of patients.

4. Nursing methods of nutritional disorders

Studies have confirmed that weight loss is associated with decreased responsiveness and tolerance to treatment, leading to shorter disease-free and overall survival. Therefore, nursing interventions for patients with laryngeal cancer after treatment are particularly important (**Figure 1**).

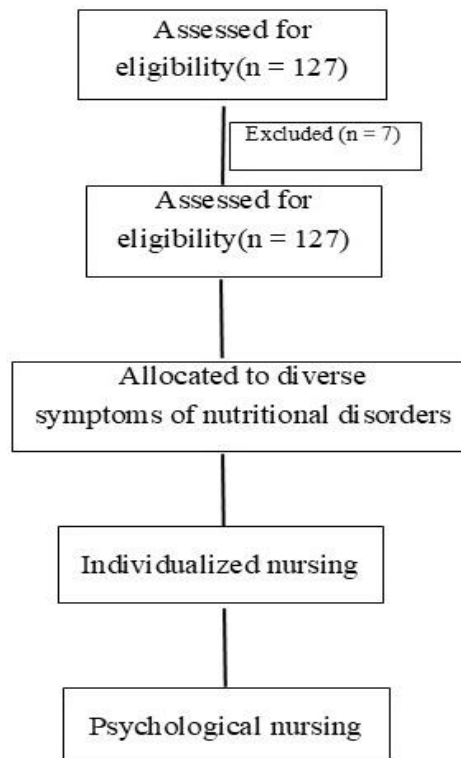


Figure 1. Outline of study design.

4.1. Dysphagia

Nursing interventions for patients with dysphagia include more communication with patients, encouraging them to perform swallowing movements as much as possible during the entire treatment process, and staying awake when patients are awake. The family members should seek help from language rehabilitation specialists, develop an effective vocal practice and diet plan for patients, and supervise and assist implementation of the plan. The combination of the two can improve the swallowing function of the patient while the larynx is exercised. For patients with decreased diets, foods with a soft texture such as soups should be selected, and coarse hard pasta, cookies, and chips should be avoided without the addition of liquid to soften the diet if the patients wish to eat a hard item. Moreover, a high-energy liquid supplement should be added to the food. Due to severe dysphagia by the enteral nutrition and percutaneous fluoroscopic gastrostomy tube, nursing interventions should include close observation and assessment of the patient's tolerance, full mouth nasal mucosa, stoma care, prevention of infection, bleeding, diarrhea, pneumonia and other complications.

4.2. Oral mucositis

Nursing for oral mucositis is challenging regarding the selection of food, which includes selecting a nutritious and light diet for patients, such as cereal congee, flour paste, mashed potatoes, egg soup, and soft noodles. Hot, sour and spicy seasonings should be avoided, the food temperature should be controlled, and water should be lukewarm. The patient should be guided to use a straw to eat and reduce the contact between the food and damaged parts of the mouth. Vitamin B, C, and E supplements

are recommended for patients to promote the recovery of mucosal injury. Alcohol, caffeine, carbonated beverages and smoking should be strictly prohibited. Patients should have an oral cleaning routine at some point, a saline gargle after dinner and a mouthwash of alcoholic type should not be used. Moreover, salivary pH monitoring should be performed in patients undergoing radiotherapy. The pH value can be balanced by a 2.5% sodium bicarbonate gargle, and the patients should be encouraged to keep the mouth moist by taking in enough water drops. Drinking beverages with the clearing, detoxifying effect of chrysanthemum and honeysuckle tea can be performed. In patients with severe mucositis, 0.5% metronidazole plus 500 mL and 5 mL dexamethasone are used to prevent infection. Local infections due to bacteria, viruses and fungi are treated after infection, based on the disease, and oral hygiene and systemic support are given. Local pain can be alleviated using pain-relieving sprays. In cases of oral mucous hemorrhage, a thrombin-containing cotton ball is used to relieve the hemostasis after local cleaning.

4.3. Oral drying

Nursing measures for xerostomia may include diet nursing, such as encouraging patients to drink more water with a daily water consumption of 2000 mL and avoidance of caffeinated and alcoholic beverages. Drinking more water can promote saliva secretion. Moist and nutritious foods, such as milk, soup, and fruit juice, are beneficial. Food seasoning should be light and not stimulatory. Foods with a lukewarm temperature are appropriate, and smoking should be avoided. Patients should be advised to moisten the mouth with Qingrejiedu oral liquid, such as from cassia seed, honeysuckle, isatis root, and dandelion water, 3~6 times a day.

4.4. Hyperhidrosis

The saliva secretion of nursing patients can be increased by encouraging patients to frequently use a saline mouthwash, clean thick oral secretions in a timely manner, and prevent the spread of germs. Moreover, drinking sugary drinks and fruit juices can reduce the oral secretions. Pineapple and papaya juices can help dilute and dissolve thick saliva. The use of a portable oral suction device can ameliorate oral cavity secretion and improve comfort.

Clinical medication can improve symptoms such as nausea and vomiting, but nursing intervention is also important. Our nursing experience suggested a reasonable patient diet of light foods, which are easy to digest. Our nursing also has foods with less grease and low sugar content, and we eat food at a suitable temperature. It is recommended to eat fewer meals and avoid both overeating and too much hunger. Moreover, the patients should avoid being supine during nausea and vomiting. The patients should be encouraged to use a seat or the semi-decubitus position. Patients should be given comfortable taste stimuli, such as fresh ginger smells, ginger-flavored tablets, and fresh orange peel smells. Outdoor activities and moderate exercise can promote gastrointestinal peristalsis and improve digestive function. If nausea and vomiting are caused by excessive and sticky saliva secretions, the saliva secretion should be controlled according to the foregoing methods.

4.5. Taste and olfactory changes

Nursing intervention for the changes in taste and smelling sensations in patients with laryngeal cancer primarily includes dietary advice and education. This intervention may include helping patients to establish the correct perception after taste changes, which alleviates discomfort and helps relieve distress, and addressing dry mouth disease and other oral diseases, such as infection and tissue necrosis, that may affect taste. The individual taste for the same food with different feelings may be exactly the opposite, so the selection and processing methods for food should be individualized. The guidance for patients with different taste substances was sorted and summarized, and a comforting taste experience was used to reduce or avoid tastes that cause discomfort in practical applications. For example, some patients may find the seasoning and spices in the foods stimulating, but others who find them uncomfortable should avoid eating flavor. Food flavors can be used in soda water or salt water rinses. Brine, baking soda or ginger juice can be used for gargling or brushing. Citrus sugar, sugar-free gum and peppermint can ameliorate the dislike towards the smell of food and tableware and promote saliva secretion. Patients suffering from a metallic flavor in their mouth should avoid using metal tableware for eating. The food temperature should be lower than normal, and salty foods should be limited. Patients should be encouraged to drink more water to promote swallowing and avoid food smells. A good diet can promote the appetite of the patient, while nutritional supplements, such as zinc supplements, may help protect and restore the taste of the patients. Patients should take the supplements according to the actual curative effect and decide whether they need further supplements.

4.6. Constipation

Although the medical treatment regimen given by doctors can improve constipation significantly, the nursing intervention also plays an indispensable role in the prevention and treatment of constipation. Nursing techniques in clinical practice for patients with constipation include promoting sufficient water intake to avoid and treat constipation, advising patients to ensure the daily water intake is 2~3 L, and insisting on the consumption of breakfast and intake of warm water, herbal tea, lemon water, and honey to relax the bowels. Caffeine-containing beverages, such as coffee, tea, and cola, and other strong drinks have a diuretic effect and inhibit gastrointestinal peristalsis. Patients should avoid drinking these types of beverages to adjust the diet and ensure that food and nutrition collocation is based on substances with a reasonable, high nutritional value. Patients with constipation should pay special attention to supplementing dietary fiber intake and consuming coarse grains with a high cellulose content and fruits and vegetables to ensure an appropriate daily consumption of vegetables (300~500 g) and fruit (200~400 g). Spinach, leek, celery, sweet potato and other vegetables, as well as banana, papaya, pitaya, other fruits, pine nuts, walnuts, sesame seeds, and other nuts are helpful for defecation. Patients with eating disorders can eat cooked food that is ground or mashed. Good bowel habits should be promoted through a reasonable and regular diet. The gastrocolic reflex in the early morning and after breakfast can promote physiological defecation. Patients should be made to understand the physiological reflexes associated with defecation, such as pressing the abdomen or coughing, and should perform defecation in time. Patients should avoid

using mobile phones while on the toilet, which can distract them and prevent defecation, thus causing constipation. Moderate exercise can promote gastrointestinal peristalsis, enhance physical fitness and emotional regulation, improve autonomic nervous system function, and promote bowel regularity; ambulatory patients should be encouraged to perform moderate walking, simple aerobics, and Tai Chi and obtain regular healthy rest. Abdominal massage along the colon in a clockwise direction for the patients, 3~4 times per day, for approximately 10 min can help patients turn over the colon contents. Moderate physical activity such as leg movements may also be helpful. In patients taking laxatives, nurses should guide patients and pay close attention to patients whose defecation has improved and those who develop diarrhea or side effects. The laxatives should be discontinued promptly in the latter cases, and the doctor should be asked to adjust the medication to avoid severe diarrhea that would cause an electrolyte imbalance. Bedrest patients should be familiar with defecation in bed. Patients should be encouraged to defecate, and their families should be educated regarding their sanitation and cleanliness to ease their psychological burden.

5. Psychological nursing

With the rapid development of medical psychology in recent years, psychological intervention for improving the negative emotion of cancer patients, improving the therapeutic effect, patient compliance and the quality of life of patients has attracted the attention of the whole society. Some studies have proved that psychological intervention has become an integral part of the overall treatment of tumors [17]. Cancer-related emotional disorder has a deleterious impact on life quality and compliance of patients, consequently reducing overall survival by 10%–20%.

Psychological nursing is a core component of the modern concept of holistic nursing. Nursing care occurs throughout the entire process, including meeting the patients' psychological needs, giving patients emotional support, regulating and coordinating the psychological state of patients with medical information exchange, providing patients with consultation and assistance, and enlisting other medical staff to reduce the psychological burden of patients [18]. Studies have shown that strengthening psychological care for inpatients can significantly improve their anxiety and mental health level, which is conducive to the smooth progress of treatment, reduces complications, promotes patients' active rehabilitation exercises and improves the long-term quality of life [19,20]. Therefore, during the close follow-up period, clinicians should pay close attention to patients without local recurrence and distant metastasis of these efforts. The medical staff should also be regarded as an organic entity considering both the patient's physiology and psychology in close connection with significant changes in the psychological state and social concerns that the patient experiences due to illness and treatment at the school level. As described previously, seven types of symptoms are related to malnutrition in laryngeal cancer patients, and psychological nursing is as important as other nursing methods of nursing intervention. A good mental and emotional state can help reduce a patient's discomfort, increase appetite, and improve the symptoms of nutritional disorders.

The nursing staff should perform the following steps: inform the patients before the treatment of the possible side effects and complications, help patients to perform

a full psychological preparation, and improve the psychological endurance of patients so that patients can rationally endure pain. Moreover, the nursing staff should maintain effective work enthusiasm, communicate effectively with patients, establish a harmonious relationship between patients and nurses, observe and understand the psychological state of patients, understand and mediate frequently, and explain and address problems in a timely manner. A relationship of mutual trust with patients should be established to allow them to seek effective help from the medical staff and relieve their psychological pressure and helplessness when encountering pain and difficulties. Tension and anxiety often make patients sensitive to increased pain; therefore, a good psychological and emotional state is helpful for improving the pain tolerance of patients. The nursing staff should strive to create a relaxed and harmonious atmosphere with sincere words and language, an enthusiastic attitude, and a cheerful expression and should encourage patients to communicate their emotional and psychological state to make the patient confident about the treatment and rehabilitation. Moreover, this treatment allows patients to endure pain more calmly. Sleep quality in patients with mental and physiological status is directly related [21,22]. Healthy sleep will have a significant impact on the patient's appetite, defecation, and other symptoms, which cause nutritional disorders. Nurses should help patients develop a reasonable sleep schedule, provide a quiet and comfortable sleep environment that encourages high sleep quality to promote the improvement of patients with mental and emotional concerns and the rehabilitation of the disease. Of course, owing to the limitation of patient numbers, more research needs to be done.

6. Conclusion

Laryngectomy, either partial or total, is associated with a high incidence of postoperative complications, thus reducing life quality and leading to poor compliance. The side effects and acute and chronic complications of laryngeal cancer often affect the normal eating behavior of patients, leading to a series of complications related to nutritional disorders, which affect treatment and ultimately damage the quality of life of patients. Studies have reported that the cause of direct death of 20% of cancer patients is malnutrition, and the incidence of complications in malnutrition patients is significantly higher than that in patients with a good nutritional status [23]. Hu found that 28.79% of perioperative larynx patients have a nutritional risk [24].

With the change of the modern medical model from the biomedical model to the biopsychosocial medical model, psychology has been widely used in clinics. Traditional medical therapies focus on the resolution of physical symptoms and prolongation of life span, but spare psychological disorders. Therefore, the purpose of improving the quality of treatment should be to improve the quality of life of patients, restore the patient's physical function, and maintain a healthy psychological state and social function of patients.

Psychological intervention can preserve the confidence of patients, improve life quality, and reduce cancer-specific anxiety and stress [25,26]. Therefore, nursing staff should pay close attention to the nutritional and psychological status of patients with laryngeal cancer and identify the malnourished patients in a timely manner. A targeted nutrition nursing program and psychological intervention should be reasonable,

comprehensive and individualized for the patient and should improve the nutritional status of the patients, reduce malnutrition-related complications, and improve the quality of life of patients with laryngeal cancer. Therefore, in addition to the necessary surgery and drug treatment, psychological intervention is worthy of popularization and application for improving malnourished patients.

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Ethical approval: This human study was approved by the Ethics Committee of the Second Affiliated Hospital, Xi'an Jiaotong University, reference number 2022YS19, informed consent was obtained from all participants.

Informed consent statement: Informed consent was obtained from all subjects involved in the study.

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