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Laporan Kes /*Case Report*

Addressing Nutritional Challenges In Chemoradiotherapy for Nasopharyngeal Carcinoma: A Case Report

Mengatasi Isu Pemakanan dalam Pesakit Kanser Nasofarinks semasa Menerima Rawatan Kemoradioterapi: Laporan Kes

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ABSTRACT

Concurrent chemoradiotherapy (CCRT) is the standard treatment for advanced nasopharyngeal carcinoma (NPC). Side effects of CCRT can significantly impair nutritional intake. This case report discusses a nutritional management of a 38-year-old, Malay, male, diagnosed with Stage IV. He was admitted for CCRT with weekly intravenous cisplatin and radiotherapy. The patient experienced poor oral intake, weight loss, mucositis, xerostomia and chemotherapy-induced electrolyte imbalances, including low sodium, potassium and chloride levels. Nutrition interventions were implemented, starting with texture-modified diets and oral nutrition supplements (ONS), to manage side effects and support dietary intake. This case report emphasizes the importance of appropriate food texture and patient-centred care in encouraging nutritional intake. However, persistent weight loss and insufficient oral intake led to the consideration of enteral nutrition via nasogastric tube feeding to ensure adequate energy and protein intake and prevent treatment disruption. This case highlights the importance of addressing nutritional challenges during CCRT to optimize patient outcomes and treatment success.

Keywords: head and neck cancer, nutrition, nasopharyngeal, cancer, chemoradiotherapy

ABSTRAK

Kemoradioterapi serentak (CCRT) adalah rawatan standard yang diberikan kepada pesakit kanser nasofarinks (NPC) tahap lanjut. Kesan sampingan rawatan CCRT boleh menjejaskan pengambilan pemakanan secara ketara. Laporan kes ini membincangkan mengenai seorang pesakit lelaki Melayu berusia 38 tahun yang didiagnosis dengan NPC Tahap IV. Pesakit ini dimasukkan ke wad bagi menjalani rawatan CCRT dengan pemberian cisplatin secara intravena setiap minggu serta rawatan radioterapi. Pesakit mengalami kekurangan pengambilan makanan, penurunan berat badan secara drastik, mukositis oral, mulut kering serta ketidakseimbangan elektrolit (tahap natrium, kalium dan klorida yang rendah) disebabkan kesan sampingan kemoterapi. Intervensi pemakanan telah dilaksanakan dengan diet bertekstur lembut dan pemakanan sokongan secara oral (ONS) diberikan kepada pesakit bagi meyokong pengambilan makanan. Laporan kes ini menekankan kepentingan pemelihan tesktur makanan yang sesuai serta penjagaan berpusatkan pesakit dalam menggaalakkan pengambilan pemakanan. Namun bergitu, pesakit masih mengalami penurunan berat badan yang berterusan dan pengambilan makanan secara oral masih kurang daripada paras optimum. Oleh itu, pemakanan secara enteral melalui tiub nasogastrik dipertimbangkan bagi memastikan pesakit menerima tenaga dan protein yang mencukupi serta mengelakkan gangguan terhadap rawatan yang dijalankan. Kes ini menunjukkan kepentingan menangani kesan sampingan CCRT bagi mencapai pengambilan pemakanan yang mencukupi dan memberikan hasil rawatan yang optimum kepada pesakit.

Kata kunci: kanser kepala dan leher, nutrisi, nasofarinks, kanser, kemoradioterapi..

INTRODUCTION

Nasopharyngeal carcinoma (NPC) is a malignancy of the nasopharyngeal epithelium. It ranks among Malaysia's top 10 cancers, accounting for 5.1% of cases with higher incidence in men (National Cancer Institute 2022). Risk factors include infections, family history and lifestyle choices. According to the Investigation of occupational and environmental Causes of Respiratory cancers (ICARE) study, the risk of head and neck cancer is increased 3.5 times among patients with a first-degree relative affected by the disease (Alrfaei et al. 2023; Radoï et al. 2013).

Moreover, tobacco use is also a key risk factor for NPC (Lander et al. 2024). According to the American Cancer Society (2024), tobacco contributes to 26% of global cancer deaths and is linked to lung, esophageal, stomach and colorectal cancers. In Malaysia, 19% of the population smokes, with the highest prevalence among male aged 35-44 years (Insitute for Public Health 2023). Smoking remains common in Asia due to aggressive marketing, economic growth, weak tobacco policies (American Cancer Society 2024). Common symptoms include neck masses, nasal discharge, ear issues (blockage, deafness, tinnitus) and neurological symptoms (Rafiq et al. 2018).

Stage I NPC is treated with radiotherapy, while advanced stages (II to IVB) require concurrent chemoradiotherapy (CCRT) and sometimes neoadjuvant chemotherapy to shrink tumors (Chen et al. 2021; Chua et al. 2025). CCRT can cause side effects such as nausea, vomiting, altered taste, infection, anemia, mouth sores, lethargy and hair loss. These symptoms can impact nutrition intake and lead to weight loss (Bhutani et al. 2024; Wang et al. 2021).

NUTRTITION ASSESSMENT

CLIENT HISTORY

The patient is a 38-years-old, Malay, mal with a known diagnosis of Stage IV nasopharyngeal carcinoma (NPC), diagnosed in early 2024. He has a background of a 10-year history of cigarette smoking, which he had stop at age 33 He was electively admitted to the oncology ward on 13 October 2024 for CCRT. The treatment plan includes radiotherapy to facio-cervical region (70Gy in 35 fractions over 7 weeks) in combination with weekly intravenous (IV) Cisplatin (50 mg/m^2). At the time of referral to the dietitian, the patient had completed 11 out of 35 planned radiotherapy fractions. The referral was made due to poor oral intake and significant weight loss observed over the preceding two weeks, raising concerns about nutritional status and treatment tolerance.

ANTHROPEMETRIC MEASUREMENTS

As part of the hospital protocol, the weight of cancer patients is monitored weekly. The patient's weight was measured using weighing scales available in oncology ward. Table 1 presents the recorded patient's weight.

BIOCHEMICAL DATA

The latest available biochemical data, recorded on 18 November 2024, is shown in Table 2. Renal profile and liver function tests were performed and show no significant changes compared to renal profiles test conducted on 13 October 2024. Electrolyte imbalances, including hyponatremia (132 mmol/L), hypokalemia (3.2 mmol/L) and hypochloremia (90 mmol/L) were detected, likely due to side effect of chemotherapy drug Cisplatin (Alrfaei et al. 2023; Oronsky et al. 2017).

NUTRITION-FOCUSED PHYSICAL FINDINGS

The patient was assessed with Patient-Generated Subjective Global Assessment (PG-SGA) on the first visit and assessment was repeated on the last visit as patient's condition worsening. The score of both PG-SGA was summarized in Table 3.

FOOD AND NUTRITION-RELATED HISTORY

The patient received a high-protein, normal-texture diet but struggled to finish meals provided due to swallowing difficulty caused by dry mouth. He consumed only a quarter of each hospital-provided meal and began oral nutrition supplements (ONS) with one scoop of standard polymeric formula 1-2 times daily, which he tolerated well. Energy intake was estimated at 1200-1500 kcal/day (58% of the requirement), and protein intake was 30-40g/day (42% of the requirement).

NUTRITION DIAGNOSIS

Inadequate energy and protein intake is related to physiological causes that increase energy and protein needs due to ongoing CCRT treatment as evidenced by current estimated energy and protein intake (58% of energy requirement and 42% of protein requirement) is less than estimated energy (2000-2400 kcal/day) and protein (80-96 g/day) requirement and 2% of weight loss in 2 weeks.

NUTRITION INTERVENTION

The aims are to optimize oral nutritional intake, maintain the current weight and support the ongoing CCRT treatment. Using dosing weight of 80 kg (at a BMI of 30 kg/m^2) for weight maintenance and to avoid overestimation, energy requirements are set at 2000-2400 kcal/day (25-30 kcal/ kg /day) and protein at 80-96g/day (1.0-1.5g/kg/ day) (Muscaritoli et al. 2021). A high protein intake is targeted to prevent sarcopenic obesity (Arends et al. 2017).

Intervention strategies included providing a blended diet to address swallowing difficulties, prescribing a standard polymeric formula as an oral nutrition supplement (ONS) with regime a regime dilution of 6 scoops in 200ml water, 3 times daily and accompanied with nutrition counselling to encourage meal completion and ONS compliance. Additionally, patients were advised to consume ONS two hours before or after meals to optimize intake. The ONS prescription was estimated to provide 792 kcal/day and 31.5g of protein/day. The nutrition intervention primarily focused on increasing dietary intake and supporting energy and protein intake with ONS as per the recommendation by Muscaritoli et al. (2021).

MONITORING AND EVALUATION

The main parameters that needed to be monitored for this patient were his biochemical data (including full blood count, renal profile and liver function test), weekly weight, dietary intake, tolerance and compliance towards ONS regimen provided and gastrointestinal (GI) symptoms (such as diarrhea, constipation, nausea, swallowing problems, sore at mouth and throat).

FIRST FOLLOW-UP (7 NOVEMBER 2024)

The patient maintained a body weight of 109.1 kg. Diet recall showed improved intake, with the patient being able to finish a blended diet and adhere to the ONS regimen. The estimated intake was 1900-2000 kcal/day with 73.5 g of protein per day.

The nutritional diagnosis remained unchanged. The intervention was adjusted to continue the blended diet and increase the ONS regimen to 8 scoops of a standard polymeric formula and 1 scoop of a protein modular product mixed with 300 ml of water, taken 3 times daily. The new feeding regimen provided 1127 kcal/day and 57 g protein/day.

SECOND FOLLOW-UP (15 NOVEMBER 2024)

The patient's weight decreased from 109.1 kg to 105.7 kg over two weeks. Symptoms worsened, including vomiting, appetite loss, early satiety, lethargy and altered taste. The patient also complained of a sandy sensation when swallowing. Dietary intake primarily relied on ONS, with minimal consumption of the blended diet.

To address these challenges, the diet was shifted to primarily rely on nourishing fluids. The ONS regimen of 12 scoops of a standard polymeric formula and 1 scoop of a protein modular product, mixed with 360 ml of water, was prescribed to be taken 4 times daily. The patient was required to prepare the ONS prescription himself. However, the patient complained of being unable to take ONS four times daily due to lethargy and early satiety.

A more flexible approach was implemented by setting a minimum daily intake of 40 scoops of a standard polymeric formula and 4 scoops of protein modular product without specific timing to increase adherence to ONS and ensure adequate intake. This regimen provided 1852 kcal/day and 97 g of protein/day. Nutrition education included the preparation of standard ONS dilution, food safety and hygiene, delivered to the patient. The patient was also advised to consume small, frequent amounts to prevent vomiting and improve tolerance

THIRD FOLLOW-UP (19 NOVEMBER 2024)

The patient adhered to the ONS regimen but continued to lose weight, reaching 104.6 kg (a 6% weight loss in 1 month) due to side effects from CCRT and a hypercatabolic state. Limited oral intake of energy and protein, along with rapid weight loss prompted a recommendation for enteral nutrition via a nasogastric tube to prevent interruption of CCRT treatment.

Nutrition counseling was provided to clarify that enteral feeding aimed to reduce the burden of consuming large ONS volume and maintain weight for ongoing treatment. The patient requested time to consider the recommendation before providing consent.

DISCUSSION

The patient experienced radiation-induced mucositis and xerostomia. Oral mucositis causes pain that limits oral intake while xerostomia, a hyposalivation condition, impairs chewing, swallowing and taste, further reducing appetite. These conditions are associated to reduced nutritional intake and increased weight loss (Müller et al. 2023; Wang et al. 2021).When planning nutrition interventions for patients with xerostomia and mucositis, food texture plays a crucial role. Soft and liquid diets are better tolerated. Patients with xerostomia prefer moist, easy-to-eat foods and increased fluid intake, while avoiding dry items like bread and crackers (Müller et al. 2023; Wang et al. 2021). Decreased nutritional intake can lead to malnutrition and weight loss (Lalla et al. 2008; Müller et al. 2023; Wang et al. 2021). Head and neck cancer patients often experience significant weight loss within two weeks of starting CCRT (Wang et al. 2021). Enteral nutrition may be initiated if intake remains insufficient to meet requirements, preventing treatment disruption. Tube feeding, via a nasogastric tube (NGT) or percutaneous gastrostomy (PEG), effectively delivers high protein and energy for weight maintenance (Chien et al. 2007). However, patient acceptance of tube feeding varies. While some find it beneficial for stabilizing weight and improving well-being, others perceive it as a

TABLE 1 Summary of anthropometrics measurements during on-going CCRT..

Date	13 Oct 2024	29 Oct 2024	7 Nov 2024	15 Nov 2024	19 Nov 2024
Height (cm)	163	163	163	163	163
Weight (kg)	111.3	109.1	109.1	105.7	104.6
BMI (kg/m^2)	41.4	41.1	41.4	39.8	39.4
Percentage of weight loss (%)	-	2% of weight loss in 2 weeks	-	-	6% of weight loss in 1 month

Note. Body Mass Index (BMI)

TABLE 2 Renal profile and liver function tests results with reference range.

Parameter	Flag	Result	Unit	Reference Range
Urea		7.8	mmol/L	2.8-8.1
Sodium	L	132	mmol/L	136-145
Potassium	L	3.2	mmol/L	3.5-5.1
Chloride	L	90	mmol/L	98-107
Creatinine		93	µmol/L	59-104
Total protein		71	g/L	64-83
Albumin		35	g/L	35-52
Total Bilirubin		7	µmol/L	<22
Alkaline Phosphatase		23	U/L	<42

Note. Lower than normal range (L)

TABLE 3 Summary of PG-SGA assessment.

Date	29 Oct 2024	19 Nov 2024
PG-SGA score	14	20
Remarks	• Decrease in weight. • 2% of weight loss in 2 weeks. • Taking only liquid foods. • Nausea, mouth sore, swallowing problem, dry mouth, fatigue. • Up and about with normal activities. • No fever • No noticeable muscle and fat loss.	• Decrease in weight. • 6% of weight loss in 1 month. • Only tolrate Oral Nutrition Supplement (ONS) • Nausea, mouth sore, swallowing problem, dry mouth, fatigue, altered taste, vomiting, feel full quickly. • No fever • Up and about with normal activities • No noticeable muscle and fat loss

shift from being a person to a patient, leading to rejection.

CONCLUSION

This case highlights the difficulties in treating Stage IV NPC in patients receiving CCRT. The treatment resulted in complications such as poor oral intake, significant weight loss, mucositis, xerostomia and electrolyte imbalance which negatively impacted the patient's nutritional status. Nutritional interventions, including texture-modified diets and ONS, were implemented to address these issues. Despite efforts and compliance, patient's nutritional intake remain insufficient, thus enteral nutrition was taken into consideration to maintain treatment continuity and prevent further weight loss

LEARNING POINTS

- This case underscores the importance of communication in multidisciplinary care when addressing both clinical and nutritional complications arising from CCRT treatment.
- Choosing an appropriate dosing weight for managing cancer patients with obesity can be challenging, as there are few to no established guidelines for weight maintenance in obese patients that benefit ongoing CCRT. The determination to dose weight relies primarily on the dietitian's judgement based on patient's condition.
- Negative perceptions towards the initiation of tube feeding are common. This causes the patient to be hesitant in giving consent and in many cases leads to rejection. Therefore, extensive nutrition counselling is essential to educate patients and shift their perception of tube feeding to emphasize its benefits for treatment.

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