Cost-utility analysis of medical nutrition for the management of cancer-related malnutrition in an out-of-hospital patient care

Introduction and objectives

Malnutrition is highly prevalent in cancer patients and is associated with poorer outcomes. Medical nutrition therapy is associated with direct medical cost savings due to a reduced rate of malnutrition-related complications, shorter length of stay and readmissions. Cancer patients receiving medical nutrition have improved health-related quality of life, better overall clinical outcomes including extended survival, as they spend longer in pre-progressed cancer state. European countries, including the UK, offer comprehensive policies to stimulate community living and homecare for cancer patients receiving government funded and accessible therapies and services. Medical Nutrition International Industry (MNI) assessed the impact of medical nutrition for the management of cancer-related malnutrition in adult oncology patients in an out-of-hospital setting.

Methodology

A hybrid decision-tree and Markov model was developed to assess the cost-effectiveness of medical nutrition versus standard of care (no medical nutrition). A decision tree was developed, utilising a hypothetical cohort of patients, receiving medical nutrition and, according to their response, either go on to have cancer-related malnutrition or be non-malnourished. Following the decision tree, patients entered a partitioned survival model. Partitioned survival models were developed in late-stage adult patients with lung, colorectal and head and neck cancers over a life-time horizon, comparing medical nutrition interventions as a weighted average of three nutrition modalities (oral, enteral, and parenteral) with standard of care. Due to the paucity of data, the impact of cancer-related malnutrition on survival was applied through a hazard ratio. This analysis base case took the perspective of the UK National Health Service (NHS) and Prescribed Specialised Services (PSS), exploring the impact of cancer-related malnutrition in the out-of-hospital setting. A literature review was performed to identify clinical inputs, including the probability of developing malnutrition in each indication, treatment effects of medical nutrition (including the impact on survival) and health-related quality of life estimates. Cost inputs included treatment costs, healthcare resource use as a corresponding cost for each health state and each cancer type, and societal costs captured as a productivity loss in 2022. Parameter uncertainty was explored in a deterministic sensitivity analysis. Model results were synthesized as incremental cost-effectiveness ratios (ICERs). Future costs and outcomes were discounted at 3.5% according to the NICE guidelines for health economic evaluations.

Results

The results suggest that medical nutrition used in an out-of-hospital setting were associated with additional costs to healthcare systems. At the same time, the modelled analysis estimated an increased life expectancy of 14%, 5% and 10% and ICERs of £18,869, £27,465, and £21,284 per QALY gained in lung, colorectal and head and neck cancer patients, respectively.

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This model analysis aimed to undertake an exploratory evaluation of economic value of medical nutrition in an oncology population. This population is very heterogenous which imposes limitations including, better defining a decision problem and data paucity.

Conclusions

A prolonged survival does not incur the same healthcare costs for cancer patients who are receiving medical nutrition interventions in community and homecare settings compared to those who are cared for in a hospital setting. This evaluation shows that the estimated ICERs are within the UK standard willingness-to-pay threshold per QALY gain, although the use of medical nutrition interventions in home cancer patients has an overall incremental cost increase. Therefore, medical nutrition interventions represent value for money and cost-effective use of healthcare resources.

HEOR infographic

Existing research has shown medical nutrition therapy is associated with direct medical cost savings due to a reduced rate of malnutrition-related complications, shorter length of stay and readmissions in patients with cancer.

Using the UK National Health Service (NHS) and Prescribed Specialised Services (PSS) perspective, **MNI's Cost-utility analysis (CUA) relied on a hybrid decision-tree and Markov model to assess the value and effectiveness of medical nutrition vs no medical nutrition for prevention of Disease Related Malnutrition in oncology patients in an out-of-hospital setting**. The model weighs in both clinical (probability of developing malnutrition) and cost (treatment costs and healthcare resources use) inputs.

Analysis results suggest an increased life expectancy of 14%, 5% and 10% and incremental cost-effectiveness ratios (ICERs) of £18,869, £27,465, and £21,284 per quality-adjusted life year (QALY) gained in lung, colorectal and head and neck cancer patients, respectively.

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Estimated ICERs are within standard willingness to pay thresholds per QALY gain, although the use of medical nutrition is associated with an overall incremental cost increase[1]. **Thus, medical nutrition interventions represent value for money and cost-effective use of healthcare resources.**

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