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Meta-analyses

A systematic review of the cost and cost effectiveness of using standard oral nutritional supplements in community and care home settings

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SUMMARY

Background & aims: Despite the clinical benefits of using standard (non-disease specific) oral nutritional supplements (ONS) in the community and care homes, there is uncertainty about their economic consequences.
Methods: A systematic review was undertaken according to recommended procedures to assess whether ONS can produce cost savings and cost-effective outcomes.
Results: 19 publications with and without a hospital component were identified: 9 full text papers, 9 abstracts, and 1 report with retrospective analyses of 6 randomised controlled trials. From these publications a total of 31 cost and 4 cost-effectiveness analyses were identified. Most were retrospective analyses based on clinical data from randomised controlled trials (RCTs). In 9 studies/economic models involving ONS use for <3 months, there were consistent cost savings compared to the control group (median cost saving 9.2%; $P < 0.01$). When used for ≥3 months, the median cost saving was 5% ($P > 0.05$; 5 studies). In RCTs, ONS accounted for less than 5% of the total costs and the investment in the community produced a cost saving in hospital. Meta-analysis indicated that ONS reduced hospitalisation significantly (16.5%; $P < 0.001$; 9 comparisons) and mortality non-significantly (Relative risk 0.86 (95% CI, 0.61, 1.22); 8 comparisons). Many clinically relevant outcomes favouring ONS were reported: improved quality of life, reduced infections, reduced minor post-operative complications, reduced falls, and functional limitations. Of the cost-effectiveness analyses involving quality adjusted life years or functional limitations, most favoured the ONS group. The care home studies (4 cost analyses; 2 cost-effectiveness analyses) had differing aims, designs and conclusions.
Conclusions: Overall, the reviewed studies, mostly based on retrospective cost analyses, indicate that ONS use in the community produce an overall cost advantage or near neutral balance, often in association with clinically relevant outcomes, suggesting cost effectiveness. There is a need for prospective studies designed to examine primary economic outcomes.

1. Introduction

Malnutrition is a common clinical and public health problem, and at a given point in time, more than 97% of it exists outside hospital [1]. It not only produces a burden to the individuals concerned such as delayed recovery from illness, more complications and increased dependency on others, but also to the services and the public providing health and social care support. Whilst the

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general benefits of treating malnutrition are well recognised [2,3] and while the effects of specific forms of nutritional support, such as oral nutritional supplements (ONS) have been reviewed in the community [4,5] and in care homes [6], information on the economic consequences is limited [7–11]. An accurate overview of the cost and cost effectiveness of ONS can be difficult to establish from the existing reviews [7–11] which have often reported the effects of a combination of interventions in various care settings, including tube feeding, parenteral nutrition, disease and non-disease specific ONS, and others in which snacks rather than ONS have dominated. Furthermore, most of the economic analyses involving standard ONS in hospital and community settings appear to have been missed, while most of the reviewed studies have been largely based on disease-specific ONS (those specifically modified for particular patient groups), rather than the standard ONS, which are used in the majority of patients. There are also apparent contradictions in the cost [12] and cost effectiveness [13–15] of ONS, which may be due to differences in methodology [16], and type of ONS used.

For patients moving from one care setting to another, the situation can become complicated because the cost of management in one setting may be offset by a larger cost saving in another setting. Furthermore, regulatory agencies have identified the need to clinically justify and monitor the effects of ONS, so that nutritional support is started only when it is appropriate to do so, according to existing evidence or guidelines, and continued for no longer than is necessary [17]. To address these issues there is a need to review the effects of ONS, which may depend on age, disease, nutritional status and whether or not ONS are given alone or in combination with other interventions, such as dietary counselling. They may also depend on whether the investigations are randomised controlled trials (RCTs) [14,18] or observational [19] studies, carried out prospectively or retrospectively, and whether ONS are administered exclusively in the community and care homes, or additionally in other care settings. The purpose of this systematic review was to critically examine the cost (or cost saving) and cost effectiveness of standard ONS in the community and care home settings in the light of the above factors. In particular, it aimed to distinguish between studies undertaken exclusively outside hospital (e.g. community and care homes), and those that are started outside hospital and continued in the hospital setting and vice versa. The review also aimed to identify gaps in the current literature, so that they can be addressed by future research.

2. Methods

2.1. Inclusion and exclusion criteria

The pre-specified inclusion and exclusion criteria are summarised in Table 1. Standard ONS was defined as a commercially available, ready to consume, multi-nutrient (complete or incomplete), liquid or semi-solid product providing a mix of macronutrients and micronutrients produced by specialist medical nutrition manufacturers. Disease-specific ONS were excluded.

2.2. Outcomes

The primary outcome measure of this review was a cost- and/or a cost-effectiveness analysis, irrespective of the type of effectiveness outcomes used (e.g. Quality Adjusted Life Year (QALY), energy intake or physical activity). The secondary outcome measures were functional and clinically relevant outcomes.

2.3. Data extraction

The literature search was undertaken on 31 March 2014. OvidSP was used to search Embase (Embase Classic + Embase 1947–2014 week 13) and Medline (1946–2014 March week 3). The Health Economic Evaluation Database (HEED) and the Cochrane library (which includes the National Health Service Economic Evaluations Database NHS EED), Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials and Database of Abstracts of Reviews and Effects were searched on the same date. Articles from all of these databases were exported into a single 'library'. The Cost-Effectiveness Analysis (CEA) Registry was cross checked independently. The search was undertaken as part of a larger systematic review that included use of ONS exclusively in the hospital setting [20].

Three sets of terms were used to search various parts of publications including the title, abstract, subject heading and any key words. These were: 1. economic, economics, cost, costs, finance, finances, budget, budgets, expense, expenses, price, prices, AUD, USD, EUR, GBP, dollar, dollars, euro, euros, pound and pounds, 2. supplement, supplements, ONS, sip, sips, feed, feeds, nutrition and nutritional; 3. utility, healthcare, resource, resources, effective, effectiveness, benefit and benefits. Only articles that included at least one search term within each of the three groups were exported into a common library. Potentially eligible papers were identified by reading the titles, abstracts and key descriptor words/phrases. They were initially screened by reading the title and abstract, and if deemed to be potentially relevant the full article was reviewed. Other publications were identified from prior knowledge, discussions with experts in the field and hand searching of retrieved full text ONS papers. The assessment of trial eligibility was undertaken by two independent assessors and any disagreements were resolved through discussion. The reasons for exclusion are shown in Fig. 1. Authors of several publications [15,21–24] were contacted to clarify specific issues.

2.4. Quality assessment

The procedure for assessing the quality of controlled trials (assessment of risk of bias) was based on the Cochrane Handbook for Systematic Reviews of Interventions, updated in 2011 [25]. The quality of the economic studies was assessed using the checklist provided by Drummond et al. [16], which was adapted for nutritional studies on the basis that some items were ambiguous or not relevant to the types of studies being assessed. Abstracts (see below) were not evaluated for quality because the brief information provided was considered to be inadequate for the detailed economic evaluation demanded by the assessment procedure. One full text paper [18], which provided a brief summary of the economic data, indicated that further data would be forthcoming, but since no such information was identified the study was only evaluated for the quality of the RCT. Evaluations based on economic criteria were only undertaken for studies reporting economic outcomes in the original paper and not those subsequently subjected to secondary analyses to establish economic outcomes.

2.5. Synthesis of data and statistical analyses

Comprehensive Meta-Analysis (version 2, Biostat Inc. New Jersey, USA) was used to undertake random effects meta-analyses. When costs were expressed in different national currency units, such as British pounds and Euros (the value of which can vary considerably over time and between different European Union countries), two procedures were undertaken: a forest plot was presented along with the statistics for each study, but without a

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