



Original article

Clinical and economic impact of malnutrition *per se* on the postoperative course of colorectal cancer patients[☆]

Melchior Jean-Claude^a, Préaud Emmanuelle^b, Heurtebis Juliette^{c,*}, Brami Michèle^d, Duru Gérard^e, Fontaine Eric^f, Hébuterne Xavier^g, Lukacs Bertrand^h, Zazzo Jean-Fabienⁱ, Panis Yves^j, Nitenberg Gérard^k

^a Acute Medicine Department, R. Poincaré Hospital, APHP, Garches, Versailles Saint-Quentin-en-Yvelines University, Medical School, EA 4497, France

^b Patient Reported Outcomes and Value Insight and Communication, Mapi Values, Lyon, France

^c JNB-Développement, 11, rue Tronchet, 75008 Paris, France

^d Technical Agency for Information about Hospitalization, Paris, France

^e Cyklad Group, Rilleux la Pape, France

^f Joseph Fourier University, University Hospital Center of Grenoble, France

^g Gastroenterology and Clinical Nutrition in CHU of Nice, University of Nice Sophia Antipolis, France

^h Urology, Tenon Hospital, Paris, France

ⁱ Anesthesia and Intensive care, Antoine-Béclère Hospital, AP-HP Clamart, France

^j Colorectal Department, Beaujon Hospital, APHP, Clichy, Paris VII University, Medical School, France

^k Medical Counselor, 6 rue Leclerc, 75014 Paris, France

ARTICLE INFO

Article history:

Received 10 October 2011

Accepted 24 March 2012

Keywords:

Colorectal cancer

Surgery

Malnutrition

Clinical outcome

Medico-economic analysis

SUMMARY

Background & aims: To assess the medico-economic impact of malnutrition in patients who underwent surgery for colorectal cancer.

Methods: We performed post-hoc analyses of data from the Alves et al. prospective study. Using standard criteria of malnutrition, 2 groups were created *a posteriori*: Well-nourished (WN) and Mal-nourished (MN) patients. The 2 groups were statistically adjusted for age, cancer status, and scheduled surgery. Individual costs were valued using the French National Cost Study. Postoperative morbidity, mortality, hospital length-of-stay (LOS), and discharge setting were compared. We defined 3 scenarios, the most accurate estimate and its upper and lower limits, to assess the economic impact of malnutrition.

Results: 453 patients were included in the analyses. Complication and mortality rates were not significantly different between the 2 groups. MN patients had a mean LOS 3.41 days significantly longer than WN patients ($p = 0.017$). In MN patients, the cost of hospital stay was increased by around 3360 €, creating an annual impact of 10,159,436 € for French non-profit hospitals.

Conclusions: Malnutrition in colorectal cancer surgical patients is associated with an increased LOS resulting in significant budget impact. Further studies are needed to investigate this impact and the related cost-benefit of perioperative specialized nutritional support and implementation of the ERAS protocol in this homogeneous category of patients.

© 2012 Elsevier Ltd and European Society for Clinical Nutrition and Metabolism. All rights reserved.

[☆] Conference presentation: The abstract of the manuscript was presented at the 33rd Congress of the European Society for Clinical Nutrition and Metabolism (ESPEN), Saturday 3 September – Tuesday 6 September 2011. It was also presented at the 14th annual European Congress of the International Society For Pharmacoeconomics and Outcomes Research (ISPOR), Saturday 5 November – Tuesday 8 November 2011.

* Corresponding author. Tel.: +33 (0) 1 53 58 57 60; fax: +33 (0) 1 53 58 57 69.

E-mail addresses: jean-claude.melchior@rpc.aphp.fr (M. Jean-Claude), emmanuelle.preaud@mapivalues.com (P. Emmanuelle), jheurtebis@jnbd.com (H. Juliette), michele.brami@yahoo.fr (B. Michèle), gerard.duru@gmail.com (D. Gérard), eric.fontaine@ujf-grenoble.fr (F. Eric), hebuterne@unice.fr (H. Xavier), bertrand.lukacs@tnn.aphp.fr (L. Bertrand), jfzazzo@invivo.edu (Z. Jean-Fabien), yves.panis@bjn.aphp.fr (P. Yves), gerard.nitenberg@gmail.com (N. Gérard).

1. Introduction/background

Clinical malnutrition, particularly in gastro-intestinal surgery cancer patients, is linked to higher morbidity and mortality in hospitalized patients, significantly longer length of stay and higher hospital costs.^{1,2} However, little information is available on these economic consequences since studies on malnutrition have not incorporated a formal economic analysis into their study design and the cost of malnutrition itself has been directly estimated in very few studies.^{3,4}

During the last decade, the financial management of hospitals has dramatically changed in France. Based on the concept of

“payment for activity”, reflected by the definition of Diagnosis Related Groups (DRG), a prospective payment system was progressively introduced in 2004 and is now the major basis (apart from research and teaching budgets) for the annual budget of hospitals.⁵ The French DRG groups are determined and annually updated with reference to the French National Cost Construction Study⁶ (ENCC, Etude Nationale de Construction des Coûts à Méthodologie Commune) and the global data base reporting statistics related to all DRGs in public settings⁷ (PMSI, Programme de Médicalisation du Système d’Information).⁸ This “payment for activity” system now has a reference standard budget allocation for each DRG and its 4 severity levels based on the presence of complications and co-morbidities (CMA, Complications et Morbidités Associées).

Colorectal cancer is the second most frequent cancer for women and the third most frequent for men in France⁹; surgery remains its first-line treatment. A high prevalence of preoperative malnutrition is observed, ranging from 20 to 46% depending on the definition of malnutrition.¹⁰ In 2005, Alves et al. published a prospective multicenter observational study in surgical diverticulitis and colorectal cancer patients, showing that preoperative weight loss was significantly associated with higher postoperative mortality.¹¹ The study authors graciously gave us access to the Clinical Record Forms (CRFs). The aim of the present study, using post-hoc analyses of data, was to assess the effect of preoperative malnutrition on clinical outcomes and on the cost of care in colorectal cancer surgery patients.

2. Material and methods

2.1. Material

2.1.1. Original clinical data

Clinical data were collected during 4 months (from June to September 2002) by Alves et al. for all consecutive patients undergoing open or laparoscopic surgery for colorectal cancer or diverticular disease.

Based on our definition of malnutrition – weight loss greater than 10% of usual body weight in the 6 months pre-surgery and/or Body Mass Index (BMI) lower than 18.5 (patients under 70 years) or 21 (patients over 70 years)^{12,13} – we created, *a posteriori*, two groups of patients: Well-nourished (WN) patients and Mal-nourished (MN) patients.

The following outcomes were compared between the two groups: mortality, morbidity (post-operative non-infectious and infectious complications), hospital length-of-stay (LOS), and hospital discharge setting. To calculate the hospital LOS, we used the difference between the date of hospital discharge or death and that of study entry.

2.1.2. Economic data

Individual costs were valued according to the French National Cost Construction Study conducted annually by the French Ministry of Health. In France, the allocation of financial resources to public and private hospitals is based on hospital activity. Hospital activity is expressed by the number of patient stays and actual costs in the French classification of DRGs. The reimbursement tariff allocated to each DRG is set annually at the national level and based on mean national observed average costs related to each DRG, and its corresponding specific LOS interval, under which the tariff is decreased with a defined daily rate and over which the tariff is increased with another specific daily rate.

There are two different sets of actual costs (which differ from reimbursement cost): one from public (including private-non-profit) hospitals and one from private for-profit hospitals. Cost

calculation methods underlying these costs and what is included in these costs differ between the public and private sectors. The actual costs from public hospitals cover all the costs linked to a stay (including medical personnel, all tests and procedures provided, etc.), while those from the private sector do not cover medical fees paid to doctors (which are paid on a fee-for-service basis) and the cost of biological and imaging tests (e.g., TDM), which are billed separately.⁶ As we did not have access to fees not covered by the DRG for the private sector, we decided to focus the present study on the public setting only (including private-non profit).

Base DRGs are divided into four subgroups according to patient severity of disease, previous medical problems, in-hospital complications, etc. Each higher level corresponds to an increased cost, with a corresponding increased tariff above the basic DRG tariff. The DRG code assigned to colorectal cancer surgery is 06C04 (“Major interventions on small intestine and colon”). We refer in this study to the actual costs of the four levels of this DRG in the 2008 French National Cost Construction Study, as it was the most recent available report at the time of our analyses.⁷ We used data reported for patients classified in DRG 06C04 restricted to those with a principal diagnosis of colorectal cancer. The proportion of patients with a main diagnosis of colorectal cancer within the whole population of DRG 06C04 patients was extracted from the 2009 French global hospital statistics data base.

2.2. Methods

2.2.1. Economic analysis

The economic impact of malnutrition on hospital costs for postoperative colorectal cancer patients was assessed by calculating the difference in actual cost per hospital-stay between MN and WN patients. Mean costs per stay were calculated using the following formula: “mean LOS (observed in the Alves et al. study) × mean actual cost per day of hospitalization (based on the actual cost of French DRG 06C04)”. Exploratory analyses were performed to assess the potential impact of co-morbidities, infectious complications and non-infectious complications on main results. The mean cost per stay for a given DRG results from the sum of the following different components (Table 1): clinical activities, resuscitation care, intensive care, permanent monitoring care, medico-technical activities (anesthesia, surgery, obstetrics, dialysis, functional testing, medical imaging, laboratories, radiotherapy, emergency), logistic and general management (laundry, catering, general services, maintenance), medical logistics (pharmacy, sterilization, biomedical engineering, hygiene and vigilance), direct expenses related to technical devices, pharmaceutical and structure costs (real estate, financial).^{6,14,15}

Malnutrition (when diagnosed) is a co-morbidity that classifies patients at a minimum of severity level 2 of the DRG and, as mentioned previously, each level corresponds to an increased DRG actual cost. Thus, in our study, well-nourished patients were distributed between levels 1 to 4 according to their co-morbidities and disease severity, whereas mal-nourished patients were only distributed between levels 2 to 4.

Mean costs per DRG were calculated by combining mean actual cost of DRG 06C04 with severity levels 1 to 4 for WN patients and levels 2 to 4 for MN patients. Distribution of patients in each level reported in the 2008 French National Cost Construction Study data was used to estimate the difference in costs between WN and MN patients.⁷ As we used mean French DRG costs and not the exact costs collected in each hospital, we defined three scenarios to calculate the mean cost per day and per stay, illustrating the upper and lower possible limits of this estimate in addition to the most accurate estimate. These scenarios differ depending upon how we calculated the mean cost per hospital day (Fig. 1).

Download English Version:

<https://daneshyari.com/en/article/2683019>

Download Persian Version:

<https://daneshyari.com/article/2683019>

[Daneshyari.com](https://daneshyari.com)