

Dietetic and Psychological Mindfulness Workshops for the Management of Cachectic Cancer Patients. A Randomized Study

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Abstract. *Aim: To determine if actively-treated cancer patients developing cachexia could benefit from participation to mindfulness workshops. Patients and Methods: Subjects developing cachexia signs while treated for cancer were randomized in a trial aiming to compare an experimental group that would participate to specific workshops based on mindfulness alternating dietetic and psychological approaches, and a control group managed in accordance to usual practice. Results: The recruitment was difficult (12% of the approached population). Finally 53 patients accepted to participate. Despite an unpredictable compliance of workshop participants, the final satisfaction score attained 75%. In comparison with the control group, patients randomized to the experimental group showed a significant benefit with an increase of their body weight and an improvement of their WHO status score. They also experienced an improvement of emotional function and observation faculty as well as a relief of fatigue and some digestive disorders. Conclusion: Selected cachectic cancer patients may benefit from this experimental approach. This approach may, however, be difficult to implement on a large scale.*

Cancer cachexia is a complex syndrome characterized not only by a significant weight loss with rapid fall of body mass index (BMI), fatigue, drop of performance clinical indices but also by an important muscle wasting with loss of lean body mass and physical power, and biological abnormalities such as inflammatory syndrome, anemia, reduction of albumin and pre-albumin serum rates (1, 2).

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Cachexia could be observed in more than 50% of cases during or after cancer treatments. It especially affects certain types of tumors, such as digestive *i.e.* pancreatic ones and upper aero-digestive tract cancers as well (1).

The management of cachectic patients is not easy, implying that outside an adapted nutritional support also a pharmacotherapy inspired by the physio-pathology of the syndrome, *i.e.* corticoids, megestrol acetate, anti-inflammatory agents or even targeted treatments such as proteasome and interleukin-6 inhibitors should be adopted (2). However, to date, no standard treatment has been acknowledged (1).

Recently, certain teams have proposed to explore possibilities of complementary medicine, such as physical exercise or therapies from oriental inspiration (tai-chi ; qi-gong). Also some psychiatric groups have studied the ability to help patients in relieving their stress by applying meditation tools as full body mindfulness (3, 4). This cognitivo-behavioural approach, inspired from buddhism philosophy, leads patients to concentrate on the actual moment making abstraction from any other temporal contingency or from any other worrisome problem. By an intense concentration on the actual moment, one can live fully any instant without judging on experience spreading out minute by minute. Mindfulness indicates the quality of consciousness which emerges when one turns the spirit at about the present moment. Patients can find by this way some means to better answer to their needs, to better stay at the listening of their body, to live better general discomfort, to relieve stress and even to expose themselves to the fear of a recurrence of the disease. These studies, sometimes randomized, have occasionally shown a favourable impact on psychological behaviour of managed patients groups (3-5).

To the best of our knowledge however, no team has proposed to cancer patients developing cachexia signs while under active treatment, to eventually participate to workshops

specifically structured on the concept of mindfulness, workshops developed not only on a psychological dimension as previously proposed by some authors (6) but also for the first time on a dietetic dimension. This type of management has been implemented by our group in a randomized study held as a pilot-project having benefited from a grant from the Cancer-Plan Belgium

Patients and Methods

The study protocol received approval from Clinique Saint-Joseph (Liège, Belgium) Ethics Committee on June 2012 (study 11/22 /597). It was held according to the good clinical practice recommendations and strictly respecting Helsinki declaration regarding human respect and rights.

Cancer patients treated in our oncology department developing evidence of cachexia (1, 2) (unwanted body weight loss $\geq 2\%$ during last month or $\geq 5\%$ during last 6 months; BMI (weight/size²) < 20 ; lowered rate of albumin and pre-albumin; inflammatory syndrome as measured by CRP titration) were eligible for the study. They were proposed to be included in a randomized trial aiming to compare standard management of cachexia (standard dietetics support; eventual nutritional complements according to estimated patients needs...) *versus* standard management and voluntary participation to psychological and dietetics workshops offering a cognitivo-behavioural approach based on full body mindfulness philosophy.

Mindfulness workshops of maximum 10 patients were animated alternatively by dedicated psychologists and dieticians. Four double workshops were programmed every 2 weeks. In diets workshops, foods had to be appreciated through the 5 senses. Enrichment technics and tasting of particular dishes at the level of the taste, of the sense of smell and the texture (touch) were developed. Details on the coverage proposed in these dietary and psychological specialized workshops is available on request.

After informed signed consent, patients were randomized between the workshops group (group A) and the control group (group B). All subjects benefited from the same clinical and biological evaluation as well as from the same detailed quantitative and qualitative food anamnesis (daily ingested total calories and distribution of calorie intakes in carbohydrates / lipids / proteins). These assessments were proposed before the beginning of workshops (time 0; T0), one month later or after 2x2 workshops (T 1 month; T1) and 2 months later or after 4x2 workshops (T 2 months; T2).

Questionnaires. Furthermore, questionnaires aiming to evaluate quality of life and psychological mindfulness perception were administered to all patients at the 3 experimental times. For quality of life, the EORTC-QLQ-C30 well known and largely validated questionnaire was elected (7-10) while for mindfulness approach, the FFMQ (Five facet Mindfulness Questionnaire) validated in various languages (*i.e.* in french) was applied (11-13). EORTC questionnaire comprises 30 randomly distributed questions (with quotation from 0 to 4) allowing after grouping to obtain scoring for Global Health, Physical, Emotional, Cognitive and Social functioning; also some scorings are centered on symptoms (fatigue; pain; sleep disturbances; appetite) and treatments side-effects (GI-tract) (7-10). In FFMQ document, 40 questions quoted from 1 to 5,

also randomly applied, allowed after grouping to assess psychological behaviour in terms of Observation, Description, Action, no Judgment and lack of Reactivity (11-13). Data collected by both questionnaires with the aim of a comparative analysis had to be added, normalized (standardized) and directed so that the higher the value between 0.0 and 100.0%, the more positive for the patient was the estimated variable (9-11).

Finally a satisfaction questionnaire was proposed to subjects at the end of their management. All data, recorded and encoded after eventual normalization (standardization) and transformation, were statistically compared at the 3 experimental times (T0; T 1 month; T 2 months) and this, for both groups A and B as well as inside each group (comparison T0 vs other experimental times). All analyses were processed through the software SAS v9.2. Continuous data were compared by Student-T, Wilcoxon and Kuskall-Wallis non-parametric tests. Categorical data were compared by chi-square and exact Fisher tests.

Results

Screening and recruitment. Between november 2011 and july 2013, 551 patients were screened regarding a possible cachexia. Among them, 429 (77.8%) were fulfilling inclusion criteria. However only 53 subjects, thus 12.3% of the candidate population and a majority of women, finally accepted to participate in the trial. Reasons for refusal were multiple: lack of personal interest (225; 52.4%), too important weakness (44; 10.3%), transport problems (28; 6.5%) or even early deaths (62; 14.5%) or medical refusal (17; 3.9%). Figure 1 presents the flow-chart of the study.

Patients' characteristics. Patients' detailed characteristics are presented in Tables I and II. Upon inclusion, no statistical difference appeared between groups A and B, following clinical and biological evaluations. Control B group had more grade 2 and 3 anorexia ($p=0.002$) and a trend to a lower rate of metastases ($p=0.06$). Similarly no difference in initial quantitative or qualitative calory intake could be observed (Table III) . Eight and 10 patients in groups A and B, respectively were receiving nutritional support; one patient in each group also benefited from an enteral feeding.

Compliance of workshops (Group A). Ultimately only 12 out of the 28 included cases followed the totality of the 8 sessions which were re-grouped in 4 sessions of 2 workshops. This lack of adhesion was surprising although enrolled patients had given a clear informed and signed consent. However applied satisfaction questionnaires showed a positive appreciation of workshops with a satisfaction rate of 75%.

Evolution of patients. No difference was observed between data recorded at experimental times T1 and T2. Subjects having participated to workshops (group A) ultimately had a favourable evolution regarding weight (average weight gain of 1.32 kg *vs.* -1.47 kg in control group; $p<0.01$), BMI (improvement of +0.31 *vs.* -0.57 in group B, $p=0.04$) and

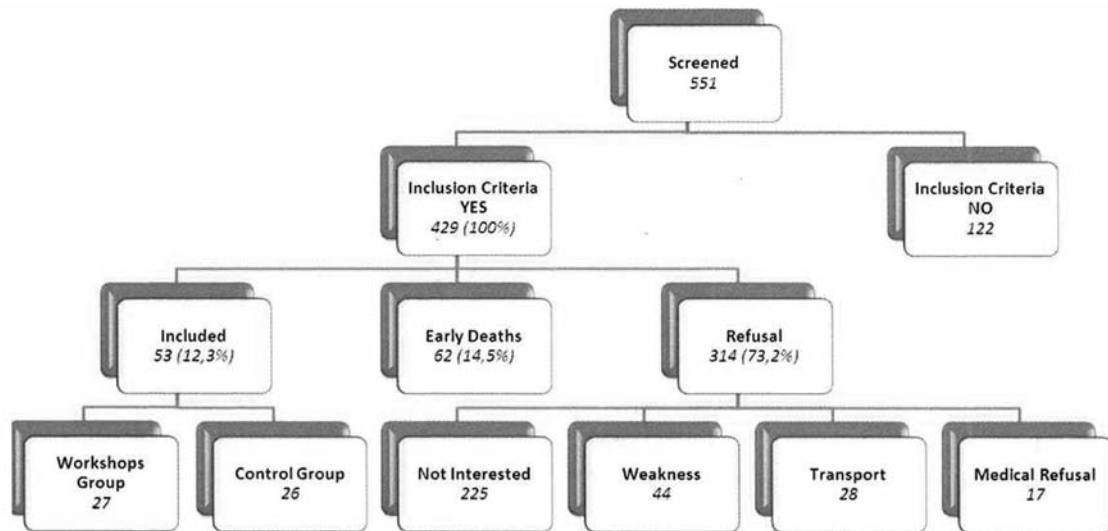


Figure 1. Trial flow-chart.

clinical WHO/ECOG indices (14) (improved in 57.1% vs. only 5.5% in other group, $p=0.004$) (Table IV). On the contrary no difference could be detected (either between groups A and B or insides groups at T0 vs. T1/T2 levels) with regards to biological parameters, quantitative or relative qualitative calories intakes (Table III) or nutritional indices (NRS) (15). Similarly, in terms of complementary nutritional support or in enteral or parenteral nutrition implementation no difference appeared at the 3 experimental times: one case of enteral feeding in each group at T0; one case of parenteral nutrition at T2 in group A and at T1 in group B and one case of enteral support at T1 in the same group.

Questionnaires of quality of life (EORTC- QLQC-30) and of mindfulness(FFMQ). All recorded and normalized data obtained by the 2 questionnaires were compared between both groups A and B at the 3 experimental points (T0; T1 month; T2 months) but also within each group (T0 vs. T1 - 1 month/T2 - 2 months; also T1 vs. T2). The only variables that significantly improved were observed in the experimental group; emotional function, fatigue and digestive disturbances (nausea; vomiting; constipation) (questionnaire EORTC) as well as faculty of observation (questionnaire FFMQ) ($p<0.05$). In the control group, only a slight improvement of fatigue and social activities were noted (questionnaire EORTC).

Discussion

To the best of our knowledge, a pluri-disciplinary management involving both psychological and dietetic teams, proposed to cancer patients, actively treated and

developing evolutive cachexia, has never been reported in the literature. The aim of our approach was to allow patients to benefit from the mindfulness concept applied both at the psychological and at the dietary level in dedicated workshops. Also at the dietary level, patients were invited to evaluate various aliments by appealing to their 5 senses. The mindfulness psychological method is a cognitivo-behavioural approach based on mindfulness meditation inspired from buddhism philosophy. Its contribution for the management of cancer patients has been recently acknowledged (16). It has been occasionally tested in randomized studies in comparison to more traditional initiatives, sometimes with positive outcomes expressed on stress reduction (17, 18). This was evidenced especially within cancer patients in search of meaning (19). However, by now, it had never been associated to a dietary appropriated and adapted dimension, especially for cancer patients groups in peculiar difficulty, such as those suffering from evolutive cachexia.

Indeed our present study came-up against multiple difficulties in terms of feasibility as well as at the level of recruitment of the patients (with only 12.3% of candidate patients having finally accepted to participate) or at the level of general compliance in workshops.

Clearly this type of program should not be applied in a Hospital routine. However despite difficulties and hazards, our randomized trial has shown that it was possible to allow small groups of cachectic cancer patients to benefit from psychological and dietary mindfulness workshops. Despite a difficult follow-up with aleatory compliance, it was evident that subjects from the experimental group, though presenting at initial assessment with less favourable clinical items (trend

Table I. Patients' characteristics.

NB	Group A (n=27)	Group B (n=26)	p-Value
Age			
Limits	31-79	37-76	NS
Mean	55.4	56.3	
Gender			
M/F	5/22	6/20	NS
Tumor type			
Breast	9	8	
GI-tract	6	6	
Head & neck	2	4	NS
Hematology	2	1	
NSCLC	2	–	
Genito-urinary	6	4	
Various	0	3	
Metastases			
Nb	23/27	17/26	0.06
%	85.2	65.4	

No significant difference was observed between groups. A trend to less metastases was seen in control group B ($p=0.06$).

Table II. Clinical and biological characteristics of patients.

Variable	Group A (n=27)	Group B (n=26)	p-Value
Weight (kg)			
Limits	36.2-88.5	41-91	NS
Mean	58.9	61.6	
BMI			
Limits	14-31	17.7-34.2	NS
Mean	20.9	22.8	
WHO Score			
2 + 3 (%)	86.7	80.0	NS
Anorexia			
Grades 2+3 (%)	72.2	40.0	0.02
Albumin (gr/l)			
Limits	29-44	28.2-47.5	NS
Mean	39.47	39.44	
Pre-albumin (gr/l)			
Limits	0.07-0.28	0.09-0.40	NS
Mean	0.19	0.22	
CRP (mg/l)			
Limits	0.1-243.1	0.1-54	NS
Mean	30.06	9.84	

Less severe anorexia was observed in control group B.

to more frequent metastases and more important anorexia), were generally satisfied from their peculiar management. They could enjoy significant weight gain and had an evident improvement of their general status. Also their quality of life was improved with regard to emotional function, observation faculty, fatigue and digestive problems.

Table III. Total daily calory intake at the three experimental times.

Experimental time	Group A	Group B	p-Value
T0			
Mean	1592	1713	NS
Limits	1168-2174	965-3260	
T1			
Mean	1513	1702	NS
Limits	1100-2065	419-3341	
T2			
Mean	1471	1562	NS
Limits	1085-1768	800-2970	

No difference was observed between groups at either evaluation moment.

Table IV. Weight BMI and clinical indices evolution.

Variable	Group A	Group B	p-Value
Weight			
Mean variation (kg)	+1.32	-1.47	0.01
Limits (kg)	-1.4+5.8	-10+1.0	
BMI			
Mean variation	+0.31	-0.57	0.04
Limits	-1.1+1.2	-4.8+2.4	
WHO score			
% improvement	57.1	5.5	0.004

No difference was observed between T1 and T2 assessment times.

For the future, this type of specialized management could only be proposed to especially-motivated patients with neoplastic cachexia. Questions regarding the eventual individualization of this type of complementary care and the possibility to implement the initiative earlier in the course of treatment or disease, thus allowing an eventual prevention of cachexia, are raised.

Conflicts of Interest

The Authors have nothing to disclose and indicated no potential conflict of interest.

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