Severely impaired nutritional status in patients with locally advanced pancreatic cancer

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Rationale

Although malnutrition is frequently described in patients with cancer, little quantitative data is available on the nutritional status and gastrointestinal function of patients with locally advanced pancreatic cancer (LAPC).

Methods

Patients with LAPC included for experimental treatment by Irreversible Electroporation (IRE) were included. Weight loss in the past 6 months (kg), body mass index (BMI), fat free mass index (FFMI), handgripstrength (HGS), nutritional intake (4-d diary), measured resting energy expenditure by indirect calorimetry (mREE) and predicted energy expenditure by Harris & Benedict equation (pREE), total energy expenditure (REE + 30%) and gastro intestinal function measured by intestinal absorption capacity of energy and macronutrients (3-d feces collection and bomb calorimetry) and exocrine pancreatic function by fecal elastase-1 (FE1) were measured before IRE (at baseline).

Results

Sixteen patients (50% male; mean age 60.3±9.5 y) were included. Median weight loss over the past 6 months was 10.1 kg [IQR 4.8–14.3], mean BMI was 23.9±2.5 kg/m^2. In 7 patients the FFMI and in 8 patients the handgrip strength were below the 10th percentile reference values.

Mean energy and median protein intake were 27±10 kcal/kg and 1.1 g/kg [IQR 0.8-1.5] respectively. Energy intake approached predicted requirements and as a result, patients have an apparently sufficient nutritional intake. However, mREE as % of pREE is significantly higher. Table 1 shows the results of energy intake and energy expenditure.

Malabsorption (<85%) of energy, fat, protein and carbohydrates was observed in 9, 8, 12 and 10 patients respectively. Median fecal energy loss was 332 [IQR 205-1103] kcal/day. Exocrine pancreatic function was severely impaired (FE1 < 100 µg/g) in 11 patients (69%). Table 2 shows the intestinal absorptive capacity.

Table 1: Energy intake vs energy expenditure

Variable*	Median [IQR]
Energy intake (Kcal/d)	1926 [1681-2641]
pTEE (pREE + 30%)	1773 [1674-1927]
mTEE (mREE + 30%)	2378 [2109-2639]
mREE/pREE (%)	132 [114-142]

Table 2: Intestinal absorptive capacity

Absorptive capacity of	Median [IQR]
Energy (%)	82.9 [47.8 – 87.9]
Fat (%)	84.2 [39.1 – 93.0]
Protein (%)	77.0 [54.5 – 81.6]
Carbohydrate (%)	80.6 [62.7 – 85.0]

*p= predicted, m = measured, REE = resting energy expenditure, TEE = total energy expenditure

Conclusion

Despite an apparently sufficient nutritional intake, patients with LAPC have a severely impaired nutritional status based on FFMI, HGS and weight loss in the past 6 months, most likely as a result of an increased resting energy expenditure and decreased intestinal absorption capacity of energy and macronutrients.

STICHTING NATIONAAL FONDS TEGEN KANKER

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