

Timing of oral refeeding after acute pancreatitis

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Abstract

Initial treatment of acute pancreatitis is mainly supportive and consists of a nothing by mouth regimen together with intravenous fluid resuscitation and analgesia. Even though nutritional deficits are common in acute pancreatitis, nutritional therapy - orally or by tube feeding - was long believed to have a negative effect on the progression of the disease. Several studies were published to determine the optimal timing, schedule and type of oral nutrition in acute pancreatitis. They show that early refeeding with a solid diet is safe and may shorten the length of hospital stay. No increased risk of refeeding intolerance, disease recurrence or other adverse events related to a more active refeeding protocol were found. For mild and severe acute pancreatitis the ESPEN Guidelines recommend that oral feeding can be actively attempted once gastric outlet obstruction has resolved and complications are under control. Depending on the clinical course nutrition can be changed to a light full diet and there is no special need for a step-wise progression to a normal full diet according to the German Society for Nutritional Medicine in Cooperation with the Swiss, Austrian and German Societies in their S3- Guideline.

1. Introduction

The onset of acute pancreatitis involves the early activation of digestive enzymes followed by a

systemic inflammatory response- mediated by cytokines. Treatment depends on the degree of severity (9).

Even though nutritional deficits are common in acute pancreatitis, nutritional therapy - orally or by tube feeding - was long believed to have a negative effect on the outcome of the disease due to an assumed stimulation of exocrine pancreatic secretion and the consequent worsening of the autodigestive processes within the pancreas (17). The goal of fasting as a traditionally therapy in acute pancreatitis has been to “put the pancreas at rest”. Much of this belief is derived from physiological studies and not supported by evidence from prospective clinical trials.

Meta-analyses of clinical trials revealed that in acute pancreatitis enteral nutrition is superior to parenteral nutrition in terms of associated complications and cost. For enteral nutrition there is a benefit in terms of risk reduction of infectious complication and mortality (5, 15, 16, 22, 24). Meta-analyses demonstrate that significantly lower mortality rates were observed in acute pancreatitis when enteral nutrition was started within 24 h of admission compared with an administration between 24 and 72 h (14), a finding somewhat disputed by a recently completed Dutch study that found no benefit of starting refeeding particularly early (2).

In mild acute pancreatitis, traditional treatment still includes initial fasting for 2 or 3 days. From this time point onwards oral nutrition is gradually increased from clear liquids to a soft solids and hospital discharge is planned on the basis of the patients tolerance to solid food (25). Studies on the optimal timing and diet for oral refeeding in acute pancreatitis are still rare.

2. When to Start Oral Refeeding

Patients with mild acute pancreatitis normally do not have an elevated nutrient or energy requirement (17). In those patients enteral nutrition is unnecessary if the patient can consume normal food orally after 5-7 days. Enteral nutrition within 5-7 days has no beneficial effect on the course of disease and is therefore not recommended (17).

For mild and severe acute pancreatitis the ESPEN Guidelines on Enteral Nutrition recommend that oral feeding (normal food and/or nutritional supplements) can be actively attempted once gastric outlet obstruction has resolved, given that it does not result in pain, and complications are under control. The tube feeding can therefore be gradually reduced as oral intake improves (17).

Different approaches in timing of the normal oral food intake after acute pancreatitis have been investigated in clinical studies. The prospective study by Lévy et al. showed that patients can be fed orally after a short period of starvation if pain ceased and amylase and lipase values are decreasing (13). Pain relapse after oral refeeding occurred in 21% of patients at the first and second day of refeeding (4). A threefold higher lipase than the upper limit of normal and a higher Balhazar's CT score at the onset of refeeding were identified as risk factors for pain relapse (13, 23).

Teich et al. investigated the optimal timing of oral refeeding in mild acute pancreatitis (25). They compared a self-selected group in whom the patients were allowed to restart eating as they chose and a lipase-directed group in whom

patients were not allowed to eat until lipase had fallen below a value 2-fold the upper limit of the reference range. They showed that the self-selected group was not superior to the lipase-directed group but also generated no additional risk in comparison with traditional fasting. They also showed a trend towards a shorter length of hospital stay in the self-selected refeeding group and no exacerbation of pain or higher relapse rates (25).

The study of Li similarly analyzed two groups of mild acute pancreatitis (14). One started eating as soon as they felt hungry and one started eating when they fulfilled the following criteria: 1) absence of abdominal pain; 2) decrease of serum amylase and lipase to less than 2-fold the upper limit of the reference range; 3) normal bowel sounds; 4) subjective feeling of hunger. There were no differences in abdominal pain relapse, transitional abdominal distension serum amylase or lipase activities higher than the upper limit of normal or hyperglycemia after oral refeeding between these groups (14). This study provides evidence that the best time to restart oral refeeding is when the patient feels hungry and this approach is safe and shortens the length of hospital stay. It is not necessary to delay oral refeeding until abdominal pain has resolved or serum pancreatic enzymes have normalized.

The same question was investigated in patients with moderate and severe acute pancreatitis. Moderate or severe acute pancreatitis often causes complications and leads to high-catabolic, hypermetabolic and hyper-dynamic stress with a higher morbidity and mortality. The optimal nutritional support has become a key element in the treatment of these patients. Data on the reinitiating of oral feeding in moderate or severe pancreatitis are mostly lacking. The study by Li et al. showed equivalent results for refeeding on the basis of hunger for moderate and severe pancreatitis (14). Zhao et al showed that refeeding based on the patient feeling hunger is safe. Although it increases the risk of hyperglycemia, which could be minimized by a

strict glucose-control protocol, there were no differences between the two groups in terms of abdominal pain, relapse of abdominal distension, organ failure or occurrence of local or systemic complications before discharge from hospital (27).

Eckerwall et al. demonstrated in a clinical randomized study the efficacy and feasibility of immediate oral feeding ad libitum as compared to traditional fasting and stepwise reintroduction of oral intake in patients with mild acute pancreatitis (6). They showed that patients with immediate oral feeding started earlier with solid food and needed less days of intravenous fluids. There were no signs of exacerbation of the disease process, increased abdominal pain or the number of gastrointestinal symptoms as a result of immediate oral feeding. They also showed an association with a significant decrease in length of hospital stay from 6 to 4 days compared to the fasting group (6).

Lariño-Noia et al. likewise found that early refeeding, as soon as bowel sounds were present, decreases the length of hospital stay by two days compared with a standard refeeding protocol (12).

3. Type of Oral Nutrition Formulation

In a typical oral-refeeding protocol, the diet is reintroduced gradually, starting with small amounts of clear liquids for the first 24h. If tolerated, the diet is stepwise changed to a soft, low-fat regime followed by a solid diet. Hospital discharge is then contingent on tolerance of a low-fat solid diet (26).

The research of Jacobson et al. investigated the initiation of oral nutrition within 3 days of hospitalization with a clear liquid diet (588 kcal, 2g fat) or a low fat solid diet (1200kcal, 35g fat) in patients after mild acute pancreatitis. They found no significant difference in the proportion of patients failing to tolerate oral refeeding suggesting that both practices are safe (10).

A standard refeeding with a stepwise increasing caloric intake is not needed as shown by Lariño-Noia et al. (12). An early refeeding using a low fat 1800 kcal diet from the first day as soon as bowel sounds were present was demonstrated to be well tolerated and safe. Gastrointestinal complaints were registered with no significant difference to the standard refeeding group (12). Similar results were found between a hypocaloric clear liquid diet, an intermediate hypocaloric soft diet and a full solid diet in patients with mild acute pancreatitis. There were no differences in pain relapse or length of hospital stay (18, 20).

Therefore the German Society for Nutritional Medicine in Cooperation with the Society for Clinical Nutrition of Switzerland, the Austrian Consortium for Clinical Nutrition and the German Society for Gastroenterology recommend in their S3- Guideline that depending on the clinical course nutrition can be changed to a light full diet (21). There is no special need for a step-wise progression to a normal full diet. An indication of clinical relevant malabsorption during the course of severe acute pancreatitis can result in pancreatic enzyme substitution (21). Oral refeeding with a diet rich in carbohydrates and protein and low in fat (<30% of total energy intake) is recommended but no clinical trials have shown it to be superior to other compositions of food. If the diet is well tolerated oral nutrition can be increased continuously and special products are not needed (17).

4. Enzyme Supplementation in Early Oral Refeeding

Pancreatic exocrine insufficiency is a relevant problem after acute pancreatitis. The severity of exocrine insufficiency is directly related to the severity of the disease (3, 7, 8, 19). Even in patients with mild acute pancreatitis the exocrine function is impaired in the early course after an acute attack but recovers in the majority of patients (7). Some of these patients undergo abdominal symptoms during oral refeeding (i.e.

flatulence, diarrhea and pain). This may be due to pancreatic exocrine insufficiency at the point when refeeding starts (11). The effect of an early supplementation of pancreatic enzymes during refeeding period after acute pancreatitis was evaluated by Kahl et al (11). They showed a trend towards a faster recovery from exocrine pancreatic insufficiency under enzyme supplementation versus placebo (14 vs 23 days; $p=0.641$) and no relevant differences with respect to safety and tolerability. Airey et al. also showed a significant improvement in exocrine pancreatic function after five days of refeeding with pancreatic enzyme supplementation (1).

5. Conclusion

A small number of studies have been conducted in order to determine the optimal timing, schedule and type of oral nutrition in acute pancreatitis. They show that a normalization of pancreatic enzyme levels is not a pre-condition for starting oral refeeding. To let the patient choose when to restart oral refeeding irrespective of serum enzyme levels might be the most appropriate

option. Furthermore, early refeeding can shorten the length of hospital stay. There still appears no consensus about the definition of “early refeeding”.

Oral intake generally started with clear liquids followed by solid low fat meals with increasing caloric content over a period of 3-6 days seems to have no advantage over starting with regular light meals. An early oral refeeding with a solid diet might therefore provide better outcomes and is safe for mild and moderate acute pancreatitis patients. However, the best randomized study so far could not show a benefit of early refeeding over on demand refeeding of patients (2), whenever the patients feels ready to take regular food by mouth. None of the previously published studies observed any increased risk of refeeding intolerance or other adverse events related to a more active refeeding protocol. Few studies indicate that pancreatic enzyme supplementation when oral refeeding starts can be beneficial in terms of pain relapse prevention but further investigations are needed to confirm this potential benefit.

6. References

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