International consensus on definition and management of postoperative ileus

Postoperative ileus (POI) refers to a pathologic pattern of gastrointestinal motility occurring after any type of major surgery. It prevents sufficient food intake, causes abdominal discomfort and increases the length of stay. It also imposes a significant economic burden to the health-care systems, with an estimated annual cost in the USA of $1 billion.

Studies on POI's etiology, risk factors, and treatment are in the focus of medical literature. However, there is little to no consenus on definition of POI, therefore its reported incidence, diagnostic algorithm, prevention and therapeutic measures underlie wide variations. A standardized definition has the potential to support future prospective studies targeting the optimization of POI's management. The aim of the present study was to achieve an international consensus among leading colorectal surgeons on the definition, prevention, and treatment of POI using the Delphi method.

Delphi research involves selection of experts who remain anonymous to each-other and who complete structured questionnaires interspersed with summary and feedback derived from their peers' and their own previous responses. Surgical program directors, chairmen of colorectal surgery departments, and academic surgeons with publications involving POI from 23 countries from 5 continents were invited to participate to this study.

The Delphi process consisted of three rounds, involving 35 experts. In round 1 experts had to answer ten open questions. Answers were grouped following qualitative thematic analysis. In round 2 experts had to rank items and agree/disagree with grouped answers from the previous round. Room for comments was provided at the end of each set. In the third and final round, structured results and comments obtained to round 2 questions were provided and experts were asked to rank their agreement on each item by the use of a 5-point Likert scale (1, strongly disagree; 2, disagree; 3, neither agree nor disagree; 4, agree; 5, strongly agree). Consensus was defined when at least 70 % of the experts in round 3 agreed or disagreed (i.e., they rated either 4 or 5 or 1 or 2 on the Likert scale, respectively).

Experts agreed that the definition of POI must include that it prevents oral intake, occurs temporarily after a surgical intervention, and is due to nonmechanical causes. Its most relevant clinical signs are abdominal distension and tenderness, and in third position, absence of normal bowel sounds. Consensus was achieved on POI's prevention by narcotic sparing analgesia and peri-operative fluid optimization. Its treatment should consist of stimulation of ambulation, cessation of opioids and administration of parenteral nutrition from the 7th day without sufficient oral intake. Naso-gastric tube placement was not deemed mandatory; however, it is a basic measure to decompress the small bowel, to comfort the patient and to reduce the risk of bronchoaspiration. The acceptable indications for naso-gastric tube placement are abdominal distension/tenderness,

vomiting>500 ml and intractable nausea. Consensus was achieved on the nonnecessity of clamping test and gastrointestinal contrast series before naso-gastric tube removal.

There was no consensus on the radiologic exam of choice and also on its necessity at all to establish diagnosis. Abdominal X-ray, computed tomography, gastrointestinal contrast studies remain acceptable modalities. There was no consensus either on the difference between postoperative nausea and vomiting (PONV) and POI.

		Agreement (%)
The definition of POI	• temporary inhibition of gastro-intestinal motility after a surgical intervention • due to non-mechanical causes • prevents sufficient oral intake	86 89 96
The definition of PONV	• can occur during the entire post-operative period • exacerbated by opioid analgesics, intraperitoneal surgery, bowel manipulation and hypokalemia • differentiation of PONV from POI is controversial	74 85 NC
Diagnosis of POI	• most relevant clinical signs: 1. Abdominal distension 2. Abdominal tenderness 3. Absence of normal bowel sounds • no consensus on the imaging modality of choice, neither on its necessity	71 NC
Indications of nasogastric tube placement and removal in POI	• abdominal distension/discomfort and vomiting (no consensus on the main criterion) • NG tube can be removed without previous clamping or previous gastrointestinal contrast study	60/48 81 100
Prevention of POI	• preventive measures are recommended to decrease the risk of POI • narcotic sparing analgesia • fluid optimization • dexamethasone and laxatives should not be used for POI prevention	96 89 74 70/81
Treatment of POI	• stimulation of ambulation/mobilization • stop of opioids • nasogastric tube placement is not mandatory • neostigmine should not be used • total parenteral nutrition is recommended in POI from the 7th day without sufficient oral intake	96 74 78 78 81

Tab. 1. Consensus on the definition, diagnosis, prevention and treatment of post-operative ileus. POI: postoperative ileus, NG: naso-gastric, PONV postoperative nausea and vomiting NC: no consensus.

This Delphi research established a definition for POI and identified measures to prevent, diagnose, and treat it (Tab. 1). Areas of controversies were also identified. The consensual definition may improve the quality of future research in this field, whereas the preventive and therapeutic recommendations may guide clinicians in the establishment of multimodal caremaps and in the management of patients presenting with POI.

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