UDC: 616.33:616.34

DECREASED INTESTINAL MOTILITY AND GLOBAL CLINICAL OUTCOMES FOLLOWING SPINAL ANESTHESIA: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT. Spinal anesthesia is associated with a decrease in subsequent intestinal motility and the development of postoperative ileus (POI), which seriously affects the patient's health and hospital expenses. This systematic literature review analyzes recent studies and examines the frequency of POI, risk factors, and clinical consequences. The results show that POI is widespread and requires multimodal prevention; spinal anesthesia can reduce pain, but does not have a universal effect on the restoration of intestinal motility.

Keywords: hot waves, respiratory failure, cardiopulmonary disorders, hot stress, COPD, asthma, atmospheric pollution, PM2.5, ozone, mortality.

СНИЖЕНИЕ МОТОРИКИ КИШЕЧНИКА ПОСЛЕ СПИНАЛЬНОЙ АНЕСТЕЗИИ И ГЛОБАЛЬНЫЕ КЛИНИЧЕСКИЕ ПОСЛЕДСТВИЯ: СИСТЕМНЫЙ ОБЗОР ЛИТЕРАТУРЫ

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АННОТАЦИЯ. Спинальная анестезия связана со снижением послеоперационной моторики кишечника и развитием послеоперационного Ильеуса (ПОИ), что существенно влияет на состояние здоровья пациента и расходы на лечение. В данном систематическом обзоре литературы проанализированы последние исследования и рассмотрены частота ИПП, факторы риска и клинические последствия. Результаты показывают, что ПОИ широко распространен и требует мультимодальной профилактики; спинальная анестезия может уменьшить боль, но не оказывает универсального воздействия на восстановление моторики кишечника.

Ключевые слова: спинальная анестезия; послеоперационный илеус; моторика кишечника; операция на позвоночнике; факторы риска

Introduction. Postoperative ileus (POI) is a transient disorder of coordinated intestinal peristalsis after surgery and anaesthesia that presents with clinical signs such as delayed gas or stool excretion, abdominal distension, indigestion, and pain.

Although POI is most often observed after abdominal and colorectal surgery, it can also occur after spinal and orthopedic surgeries.

Spinal anesthesia is widely used in many clinical cases to reduce pain and ensure patient comfort. However, its influence on intestinal motility and its role in the development of POI is complex and controversial. Some studies show that intestinal function is restored faster when pain is controlled with spinal or regional anesthesia and when opioid drugs are discontinued.

Therefore, a systematic analysis of the risk of decreased intestinal motility and POI after spinal anesthesia and spine surgeries is important from the point of view of clinical practice and patient health. The purpose of this review is to analyze the available literature, identify the main risk factors, and develop recommendations for preventing POI.

POI and spinal surgery. A number of risk factors for the development of postoperative ileus (POI) after spinal surgery have been identified. Analysis shows that male sex, anemia, liver disease, perioperative fluid and electrolyte imbalance, and multi-level surgeries involving more than three vertebral segments are associated with POI. According to the results of a retrospective analysis, conducted in the context of complex operations that correct spinal deformities, 32 (18.4%) out of 174 patients had POI; these cases were associated with a significant increase in the length of hospital stay.

Spinal/regional anaesthesia and effects on intestinal motility. However, all analyses show that spinal or epidural anesthesia does not always help to quickly restore intestinal function. Some studies have shown that spinal anesthesia reduces pain and shortens hospitalization, but no significant difference was observed in terms of "time-to-flatus," "time-to-stool," and "time-to-normal diet." In parallel, it was noted that the effectiveness of epidural analgesia or spinal analgesia in the prevention of POI is also inconsistent; in some studies, epidural anesthesia did not significantly prevent colorectal ileus.

POI pathophysiology: new theories and factors. Recent studies have shown that the intestinal microbiota and its metabolites - bile acids, short-chain fatty acids, aryl-hydrophobic receptors, and cytokine mediators - play an important role in the process of POI. This adds new biological mechanisms to the disruption of intestinal movement after surgery and anesthesia. According to general data, such factors as surgical stress, activation of the sympathetic nervous system, opioid analgesics, fluid-electrolyte imbalance, late mobilization, and late return to food are also important in the development of POI.

Outcomes and clinical significance of POI. POI causes discomfort for the patient, increases the risk of prolonged stay in the hospital, expenses, and complications - deep venous thrombosis, sepsis, aspiration pneumonia, cardiovascular complications. At the same time, due to POI, patients may also require additional interventions such as resuscitation, parenteral feeding, and nasogastric decompression.

Materials and Methods. Articles published in recent years (2000-2025) were searched for in electronic databases (PMC, PubMed, etc.). Keywords: "spinal

anesthesia," "spine surgery," "post-operative ileus," "gastrointestinal motility," "bowel function." Selected publications include meta-analyses, retrospective and prospective studies, and review articles.

Conclusion. The above analysis shows that - POI after spinal anesthesia or spinal surgeries is a significant condition and activity of serious clinical problems. In particular, a number of risk factors (sex, anemia, liver disease, fluid-electrolyte balance, multi-segment operations) increase the risk of POI.

However, spinal anesthesia is not a universal solution to protect against POI: some studies have shown that intestinal motility was not quickly restored. This means that the prevention of POI is not solved only by the type of anesthesia - a multifactorial, multimodal approach is required.

New biological mechanisms - for example, determining the role of the microbiota and its metabolites - open up new prospects in the prevention and treatment of POI. In this context, antibiotics, opioids, fluid regimen, analgesic strategies, and dietary regimen during the perioperative period should be reviewed.

There is also heterogeneity in existing studies - that is, differences in patient population, type of surgery, anesthesia and analgesic protocols - which complicates the development of general, global recommendations.

Postoperative ileus (POI) after spinal surgery is a serious and widespread problem that has a significant impact on patient outcomes and health systems. Spinal anesthesia and regional analgesia can be factors that reduce the risk of POI, but this is not always a guaranteed solution, since several risk factors are involved in the development of POI. A multimodal approach to the prevention and management of POI is necessary - fluid-electrolyte control, minimal opioids, early mobilization and return to nutrition, as well as strategies that take into account new biological mechanisms, such as the intestinal microbiota. In the future, it is important to identify patients at risk, optimize protocols with low non-standardness, and expand research focused on the microbiota.

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