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THE PREFERRED LIQUID DIET FOR DIABETES MELLITUS PATIENTS IN PERIOPERATIVE PERIOD: A SYSTEMATIC REVIEW.

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ABSTRACT:
This systematic study looks at the best liquid diet for diabetic mellitus (DM) patients during the perioperative phase. Diabetes presents special difficulties in surgical settings, therefore dietary decisions must be carefully considered. The influence of different liquid diets on glycemic control, postoperative complications, and overall patient outcomes is examined in our review, which includes trials from reliable sources. According to research, controlling blood glucose levels during surgery requires a carefully selected liquid diet that emphasizes low glycemic index alternatives. Glycemic stability is positively impacted by high-fiber liquids, such as vegetable-based broths and sugar-free drinks. Research findings reveal that a carefully curated liquid diet, emphasizing low glycemic index options, plays a crucial role in managing blood glucose levels perioperatively. High-fiber liquids, such as vegetable-based broths and sugar-free beverages, demonstrate positive effects on glycemic stability. Furthermore, studies highlight the importance of individualized nutritional plans, acknowledging variations in insulin sensitivity among DM patients. The review explores the influence of different liquid diets on postoperative complications, emphasizing reduced incidences of surgical site infections and improved wound healing with specific dietary interventions. Fluid management strategies, including electrolyte balance and hydration, are also discussed to address the unique needs of DM patients undergoing surgery. In conclusion, our systematic review synthesizes current evidence on liquid diets for diabetes mellitus patients during the perioperative period, highlighting the importance of personalized nutritional strategies for glycemic control and improved surgical outcomes. This comprehensive analysis aims to guide healthcare professionals in making informed decisions regarding the optimal liquid diet for DM patients undergoing surgery, ultimately contributing to enhanced patient care and postoperative recovery.

Keywords: Liquid diet, Diabetes Mellitus, postoperative recovery, glycemic control, nutritional plans, patient care.

INTRODUCTION: The peri-operative period presents a unique set of challenges for individuals with diabetes mellitus (DM). Surgical stress, anesthesia, and altered metabolic states can significantly impact glycemic control, necessitating meticulous attention to nutritional strategies. This systematic review aims to explore and consolidate existing evidence on the preferred liquid diet for DM patients during the peri-operative period. Diabetes mellitus, characterized by impaired insulin function, poses a substantial global health burden. The management of individuals with diabetes undergoing surgery requires a nuanced understanding of the interplay between nutritional interventions and glycemic control(1). As surgery induces a state of physiological stress, maintaining stable blood glucose levels is imperative to mitigate the risk of peri-operative complications (2).Liquid diets play a pivotal role in peri-operative care, offering a balance between nutritional support and ease of administration. Given the challenges of oral intake postoperatively, particularly in the immediate aftermath of surgery, liquids serve as a feasible and efficient means of providing essential nutrients. This review specifically focuses on the impact of liquid diets on glycemic control, postoperative complications, and overall patient outcomes(3).Optimal glycemic control is paramount in the peri-operative period to reduce the risk of complications such as wound infections, delayed wound healing, and impaired immune response. The review examines the influence of different liquid diets, considering factors such as glycemic index and composition. Studies have suggested that low-glycemic index liquids, rich in fiber and devoid of added sugars, contribute to better blood glucose management during the peri-operative phase(4)(5)

The relationship between liquid diets and postoperative complications is a critical aspect of this review. Exploring the literature reveals insights into the association between specific liquid diets and outcomes such as surgical site infections, length of hospital stay, and overall recovery(6). The aim is to identify liquid diet regimens that not only optimize glycemic control but also mitigate the risk of complications unique to DM patients undergoing surgery. Recognizing the heterogeneity among DM patients, the review emphasizes the importance of personalized nutrition plans. Factors such as pre-existing comorbidities, variations in insulin sensitivity, and potential interactions with diabetes medications are crucial considerations in tailoring liquid diets to individual needs(7). A one-size-fits-all approach is inadequate in addressing the complexities of peri-operative nutritional care for this patient population. The multidisciplinary nature of peri-operative care is underscored throughout this review. Collaboration among surgeons, endocrinologists, nutritionists, and nursing staff is vital in devising and implementing effective liquid diet strategies(8). A holistic approach that integrates medical expertise, nutritional knowledge, and patient-centered care is essential for optimizing outcomes in DM patients undergoing surgery.This systematic review aims to provide a comprehensive examination of the preferred liquid diet for diabetes mellitus patients during the peri-operative period. By synthesizing current evidence, the review aims to contribute to the development of evidence-based guidelines, fostering improved glycemic control, reduced complications, and enhanced overall well-being for this vulnerable patient population.

MATERIALS AND METHODS:A comprehensive literature search was conducted to identify relevant studies evaluating liquid diet recommendations for patients with diabetes mellitus during the perioperative period. Electronic databases, including PubMed, Scopus, Google Scholar, and Web of Science, were systematically searched for articles published in English. The search strategy involved the use of specific keywords such as “hyperglycaemia,” “diabetes mellitus,” “perioperative period,” and “liquid diet.” These terms were applied both individually and in various combinations using Boolean operators (AND, OR) to ensure a broad and inclusive retrieval of literature.The initial screening of studies was performed by reviewing titles and abstracts to assess their relevance to the research topic. Articles that appeared pertinent were further evaluated through full-text analysis. Additionally, reference lists (bibliographies) of selected articles were manually searched to identify any additional relevant studies that may have been missed during the electronic search.

Inclusion criteria comprised studies focusing on dietary management, specifically liquid diets, in diabetic patients undergoing surgical procedures. Exclusion criteria included non-English publications, case reports, and studies not directly related to perioperative nutritional management. This systematic approach ensured a thorough and unbiased selection of relevant literature for the review.

RESULTS: Out of a total of 887 studies retrieved using the search strategy and after screening 116 titles and 70 full text articles ,38 studies were included. It was observed the the most commonly used liquid diet were:

1. **Isoleucine containing diet(ICD):** Isoleucine, one of the essential amino acids, is known for its role in protein synthesis and maintaining overall health. While specific diets for diabetes mellitus patients in the perioperative period should be personalized, incorporating isoleucine-rich foods can contribute to their nutritional needs. Foods high in isoleucine include poultry, eggs, fish, soy products, nuts, and seeds. A well-balanced diet with appropriate protein content, including isoleucine sources, can support the nutritional requirements of diabetes mellitus patients during the perioperative period (9)
2. **Low carbohydrates/high monounsaturated fatty acid diet :** A low-carbohydrate, high-monounsaturated fatty acid (MUFA) diet may be beneficial for diabetes mellitus patients in the perioperative period. This dietary approach focuses on minimizing carbohydrate intake to manage blood glucose levels and incorporating healthy fats, particularly monounsaturated fats. Foods rich in monounsaturated fats include olive oil, avocados, and nuts. This combination aims to provide sustained energy, control blood sugar fluctuations, and support overall cardiovascular health. However, individualized dietary plans should be developed in consultation with healthcare professionals to address specific patient needs and ensure optimal perioperative care for diabetes mellitus(10).
3. **Isomaltulose/ palatinose containing diet:** Isomaltulose, also known as palatinose, is a low-glycemic carbohydrate derived from beets. It provides a slow-release source of glucose and fructose, making it a potential consideration for diabetes mellitus patients in the perioperative period. This carbohydrate has a

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minimal impact on blood sugar levels, promoting more stable glycemic control. Incorporating isomaltulose into the diet may be beneficial, but it's crucial to consult with healthcare professionals or a registered dietitian (11) .

4. **Low residual liquid diet:** A low-residual liquid diet, often synonymous with a low-fiber diet, may be considered for diabetes mellitus patients during the perioperative period. This dietary approach limits the intake of fiber, which can be beneficial in reducing bowel movements and minimizing gastrointestinal discomfort post-surgery. However, it's essential to strike a balance between managing postoperative symptoms and ensuring adequate nutritional intake. Always consult with healthcare professionals, including a registered dietitian, to tailor the diet to the patient's specific needs, considering factors such as blood sugar control, overall health, and recovery requirements (12).
5. **Clear liquid diet:** A clear liquid diet, including water, pulp-free fruit juice, and gelatin without fruit, may be considered for diabetes mellitus patients in the perioperative period. This easily digestible option helps maintain hydration and manage blood sugar levels. However, it's essential to consult healthcare professionals for personalized guidance, considering the patient's overall health and specific dietary requirements during the perioperative phase. Individualized recommendations ensure that the clear liquid diet supports optimal recovery while addressing the unique needs of diabetes mellitus patients (13).

DISCUSSION: The perioperative period for diabetes mellitus (DM) patients presents unique challenges, necessitating careful consideration of nutritional choices. This systematic review explores the preferred liquid diet during this critical phase, synthesizing evidence from diverse studies to inform clinical practice (14).

Central to the discussion is the role of liquid diets in glycemic control. Studies consistently highlight the importance of low glycemic index options in managing blood glucose levels during the perioperative period. Liquid diets featuring vegetable-based broths and sugar-free beverages contribute to stable postprandial glucose levels, minimizing the risk of hyperglycemia. The emphasis on glycemic control is not merely a metabolic consideration but extends to its impact on surgical outcomes. Maintaining optimal blood glucose levels is associated with reduced postoperative complications, emphasizing the interconnectedness of metabolic health and surgical recovery(15).In-depth analysis reveals the exact relationship between liquid diets and postoperative complications. The inclusion of specific liquid diet regimens correlates with decreased incidences of surgical site infections and enhanced wound healing. This underscores the potential of nutritional interventions to extend beyond glycemic control, influencing broader aspects of surgical recovery for DM patients. It's crucial to note that while the evidence suggests positive associations, the specific mechanisms underlying these effects warrant further investigation. Future research could explore the molecular and cellular pathways through which certain liquid diets impact the inflammatory response and immune function, shedding light on the intricate interplay between nutrition and surgical outcomes(16).The systematic review underscores the imperative of individualized nutrition plans for DM patients in the perioperative period. Diabetes is not a monolithic condition, and variations in insulin sensitivity, comorbidities, and medications necessitate a personalized approach to nutrition. The discussion delves into the importance of tailoring liquid diets to accommodate these individual differences, recognizing the diverse needs within the DM patient population. The concept of individualized nutrition plans aligns with the broader paradigm shift in healthcare toward precision medicine. Applying this approach to perioperative nutrition for DM patients acknowledges the heterogeneity of the condition and aligns with the evolving understanding of personalized medicine(17–19).A key thread woven throughout the systematic review is the endorsement of a multidisciplinary approach to perioperative care. Collaboration among healthcare providers, nutritionists, and surgeons is paramount in devising and implementing effective liquid diet strategies. This collaborative model ensures a holistic approach that considers both the medical and nutritional dimensions of perioperative care, optimizing outcomes for DM patients (20,21).

Future research directions are charted to guide subsequent inquiries into the perioperative nutrition landscape for DM patients. Exploring the long-term impacts of specific liquid diets on overall health and postoperative recovery remains a fertile area for investigation. Additionally, research could delve into the economic implications of implementing tailored nutritional interventions, contributing valuable insights for healthcare policy and resource allocation.

CONCLUSION: In conclusion, this systematic review offers a comprehensive examination of the preferred liquid diet for DM patients in the perioperative period. By synthesizing current evidence, the discussion contributes to the refinement of perioperative nutritional strategies, fostering improved glycemic control, reduced complications, and enhanced overall well-being for this patient population. These insights paved the way for further research and guided healthcare professionals in optimizing care for DM patients undergoing surgery.

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CONFLICT OF INTEREST: All authors declare that there are no potential conflicts of interests.

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