Evaluation of Carbohydrate-Containing Fluid Preloading in Pregnant Women Using the Obstetric Quality of Recovery Scale after Caesarean Section

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ABSTRACT

Objective: To test the short and long-term effects of consuming carbohydrate-rich beverages on patient-centred outcomes after caesarean delivery under spinal anaesthesia.

Study Design: A prospective randomised controlled study.

Place and Duration of the Study: Department of Obstetrics and Gynaecology, Karaman Training and Research Hospital, Karaman, Turkiye, between May 2023 and February 2024.

Methodology: A total of one hundred parturients were randomly assigned to two groups. Fifty parturients were in the control group (Group C) and 50 in the oral carbohydrate preloading group (Group OCH). Group OCH were given carbohydrate-rich fluids, while those in Group C received distilled water before undergoing elective caesarean surgery. The primary outcome of this study was to evaluate the Obstetric Quality of Recovery-10 scores (ObsQoR-10) at the postoperative 24th hour. Secondary outcomes were ObsQoR-10 scores on the postoperative 3rd and 7th day, postoperative pain scores, VAS scores, opioid consumption, and sensation of breast fullness. Welch's t-test and mixed-effect models were employed to analyse the outcomes.

Results: The total recovery scores of both groups at the 24th hour, 3rd day, and 7th day were similar (Group C: 80.08 ± 15.58, Group OCH: 80.18 ± 14.6; Group C: 93.98 ± 7.45, Group OCH: 94.12 ± 8.86; Group C: 97.2 ± 5.16, and Group OCH: 98.16 ± 3.18, respectively). The sensation of breast fullness was significantly higher in the Group OCH ($p < 0.05$). No difference was recorded between the groups regarding postoperative tramadol consumption, VAS scores, and the presence of postdural puncture headache ($p > 0.05$).

Conclusion: Although carbohydrate-rich beverages did not affect the ObsQoR-10 score, they may have a notable influence on the increase of breast fullness and tenderness, which promotes breastfeeding among postoperative mothers.

Key Words: *Carbohydrate-containing fluid*, *Caesarean section*, *ObsQoR-10 scale*, *Postpartum recovery*, *Spinal anaesthesia*.

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INTRODUCTION

One of the most common surgical procedures in obstetrics and gynaecology is the caesarean section (CS). Usually, a period of fasting for 6-8 hours is required before this elective surgery to minimise the chances of pulmonary aspiration during the administration of anaesthesia. During the early postoperative period, mothers are recuperating from a significant surgical procedure, which is known to result in an elevated metabolic demand similar to that of physical activity. Additionally, they are responsible for caring for their newborn and potentially breastfeeding.

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According to scientific literature, postpartum physical and lactation performance might be negatively affected with preoperative long period of fasting. As a result, it is acceptable to assume that recovery from surgery would also be negatively affected.[1] In the last ten years, there have been improvements in the development of carbohydrate-rich beverages. These beverages are designed with the right concentration and osmolality to be digested and eliminated from the stomach within 90 minutes in individuals. Based on established guidelines (grade-A evidence), parturients may consume these easily digestible liquids containing carbohydrates for 2 to 3 hours before receiving anaesthesia.[2]

The postnatal period significantly impacts women's health, infants' development, and their long-term physical, psychological, and emotional well-being. Recovery after caesarean delivery is challenging due to factors such as patient condition, surgical procedure, anaesthesia, and postoperative complications. Defining postpartum recovery by identifying categories and patient-reported outcome measures is crucial to optimising the recovery quality and improving overall care.[3] Ciechanowicz

et al. recently created the Obstetric Quality-of-Recovery-11 (ObsQoR-11) score, a questionnaire consisting of 11 items specifically designed to evaluate the quality of recovery after elective and intrapartum caesarean delivery. It was adapted from the Quality of Recovery 40.[4] The ObsQoR-11 questionnaire evaluates various aspects of patients' well-being, including their physical comfort (such as experiencing side effects including nausea, vomiting, dizziness, and shivering), pain levels, physical independence (ability to move without assistance, ability to hold and feed the baby without help, and personal hygiene/care), and emotional state (feeling of being in control).[4] ObsQoR-11 has been modified to ObsQoR-10, a 10-item questionnaire that includes patient feedback by combining severe and moderate pain groups.[5]

The overall score might vary from 0 to 100, where 0 represents the poorest recovery and 100 represents the best recovery. The ObsQoR-10 is a patient-centred, multidimensional, and standardised assessment tool for evaluating the postpartum recovery. It has shown significant potential in various healthcare settings with its validity, reliability, responsiveness, and clinical value being assessed.[5,6] Clinical studies have investigated factors affecting the ObsQoR-10 after caesarean section.[7,8] Until now, there was no study investigating the effect of oral carbohydrate-containing solutions on a newly established tool of ObsQoR-10. This randomised double-blind controlled study aimed to address the short- and long-term patient-centred outcomes evaluated with ObsQoR-10 after caesarean delivery in carbohydrate-rich beverage and control group, which were consumed two hours before in patients undergoing elective caesarean surgery under spinal anaesthesia.

METHODOLOGY

This study was conducted at Karaman Training and Research Hospital, between May 2023 and February 2024. It was a prospective, randomised study that received approval from the Ethics Committee of Karamanoglu Mehmetbey University, Faculty of Medicine, Karaman, Turkiye, with approval number 10-2022/16. The trial was registered on (ClinicalTrials.gov) prior to enrolling the first patient (NCT 05841693, registered on 11.4.2023). Out of 100 parturients, 50 of them were assigned to the control group C while the other 50 were assigned to the oral carbohydrate preloading group OCH. Every parturient satisfied the eligibility criteria was invited to participate in the study and gave their signed informed consent. The study included parturients who met the following criteria: Having a single foetus, a gestational age between 38 and 42 weeks, an American Society of Anesthesiology functional status (ASA) of 2, undergoing a caeserean section (CS) with spinal anaesthesia, and aged between 18 and 45 years. The study excluded women with obesity, hiatus hernia, persistent acid reflux, intestinal obstruction, or tube feeding, which delayed stomach emptying. In addition, women who had been diagnosed with mental or psychiatric disorders, malignancy, diabetes mellitus, pregnancy-related diabetes mellitus, eclampsia, preeclampsia, foetal abnormalities, emergency caesarean section indication, preterm birth, chronic pain complaint, chronic use of anti-inflammatory medications, or opioid or drug abuse were also not included. Computer-generated randomisation was performed, then allocation concealment were created with numbered, sealed, and opaque envelopes. The hospital dietitian who did not participate in this study prepared the preoperative carbohydrate-rich solution. All the drinks were deposited in a sterile environment of 40˚C. The two drinks were different in taste and colour, therefore it was difficult to mention optimum blinding.

The two patient groups, Group C and Group OCH, were allowed free consumption of food and beverages until 24:00 PM on the day before birth. The 'OCH loading' intervention permits the patient to ingest 200 ml of liquid within a period of up to 2 hours before the administration of anaesthesia. Following the randomisation process, Group OCH drank an oral beverage rich in carbohydrates (100 mL solution containing 22.5 g of maltodextrin and 2.5 g of glucose), while Group C consumed the same amount of distilled water.

The gastric volume was evaluated preoperatively with gastric ultrasonography, which is a noninvasive procedure simply conducted at the bedside that causes minimum discomfort, and eliminates radiation exposure. In the qualitative assessment, the stomach antrum was classified as empty when it appeared flat and devoid of any fluid. Regarding detection of fluid, the stomach antrum was characterised as fluid. Maternal gastric volume was assessed in a semirecumbent right-lateral position (head elevated at 45 degree) with an ultrasound (Mindray DC-60) after congestion of study fluid in the preoperative waiting area. Gastric ultrasonography was performed by the experienced anaesthesiologist who was blinded to the consumed fluid. The gastric antrum was scanned in a sagittal plane after identification of the left lobe anteriorly and the abdominal aorta posteriorly. Then the gastric antral image was obtained in a resting period. The antral cross- sectional area (CSA) was calculated using the formula (CSA = л (d1 x d2)/4) created by perpendicular diameters in a longitudinal (d1) and anteroposterior plane (d2). All the measurements were done from serosa-to-serosa of the gastric antrum.

After entering the operating room, an 18-gauge cannula was inserted into the patients for coloading of 500 cc of lactated Ringer's solution, followed by 10 ml/min of lactated Ringer's continuous infusion. Monitoring involving non-invasive blood pressure, electrocardiogram, and oxygen saturation was applied to all patients. Spinal anaesthesia at the L3-4 or L4-5 interspinous space was induced with a 10 mg heavy bupivacaine and 20 mcg fentanyl mixture in the sitting position. Subsequently, the patients were moved to a supine position with a 15-degree rotation to the left side to decrease the uterine compression on the inferior vena cava. During the perioperative period, the hypotension was defined as a 20% decrease in mean arterial pressure (MAP) and treated with 5 mg ephedrine intravenously.

At the end of the operation, a solution of 10 cc bupivacaine diluted with 10 cc physiological saline was administered by the surgeon subcutaneously along the incision lines of both sides to all patients. The patients admitted to the ward were prescribed oral analgesics (1000 mg of paracetamol three times a day and 75 mg

of diclofenac sodium twice a day). In cases of uncontrolled pain with oral analgesics in the first 24 hours postoperatively, tramadol 50 mg was administered intravenously to manage pain described by the patient as a visual analogue scale (VAS) ≥4. Before the discharge of the patient, at the 24th hour postoperatively, patients filled out the Obs QoR-10 and VAS forms. The ObsQoR-10 questionnaire comprises 10 items that evaluate postoperative recovery quality. The initial four questions assess the severity of symptoms, including pain, nausea or vomiting, dizziness, and shivering. The patient rates each question on a scale from 0 (highest severity) to 10 (minimum severity). The final six questions evaluate the patients' agreement with statements related to recovery, with scores varying from 0 (no agreement) to 10 (full agreement). The scores from all ten questions are aggregated to yield a total score between 0 and 100, with a higher number signifying superior recovery quality. The sensation of breast fullness and the need for tramadol use were also documented. On the third and seventh days after surgery, the responsible physician contacted the postpartum mothers through phone and asked for the same items from the questionnaire. The primary outcome of this study was the evaluation of the quality of recovery at the postoperative 24 hours using the QoR-10 scale. Secondary outcomes were pain evaluation using a VAS and opioid consumption in the first 24 hours postoperatively, and quality of recovery on postoperative 3rd and 7th days using the QoR-10 scale, and the presence of headache on the 3rd and 7th days postoperatively. Before discharge, the sensation of breast fullness was also assessed. Sample size calculation of this study was estimated according to the QoR-10 score at 24th hour after caesarean delivery, based on a pilot study including 10 parturients per group. The mean standard deviation (SD) in QoR-10 score in Group C was 68 (16) and 78 (16) in Group OCH. It was assumed that a minimum difference of 10 points would be required between the two groups. A total sample size of 100 parturients (50 per group) was estimated to achieve 80% power and a two-sided ∝ level of 0.05, accounting for a 20% drop-out. The data analysis was performed using the R 4.3.2 software.

Descriptive statistics for numerical variables (all variables taken into consideration except gender and sensation of breast fullness) were presented using mean and standard deviation, and for categorical variables (gender and sensation of breast fullness) using frequency and percentage values. Pearson's Chi-square or Fisher's exact test was used to analyse categorical changes. Welch's t-test and mixed-effects models included time and groups as fixed effects and used intercepts as the only random effect in the analysis of numerical variables. Due to the use of Welch's test, it had only been checked visually if the distribution of residuals was close to a normal distribution. Post-hoc pairwise comparisons were conducted using least square means. A value of $p < 0.05$ was considered significant.

RESULTS

A total of 101 participants were evaluated for eligibility, however, one parturient was excluded due to unsuccessful spinal anaesthesia (Figure 1). The remaining 100 participants were randomly divided into two groups (Group OCH, n = 50; Group C, n = 50). Table I presents the demographic and other obstetric data of the participants, their newborns, ultrasound results, and operational parameters. Perioperative blood glucose levels were similar in both groups ($p > 0.94$). The administered ephedrine amount was higher in the Group OCH ($p < 0.05$). Postdural puncture headache presence and VAS scores obtained at the 24th postoperative hour, the 3rd day, and the 7th day after surgery were the same between the groups ($p > 0.05$). The amount of rescue analgesic required postoperatively was higher in Group C, while it was insignificant ($p > 0.05$).

Table I: Comparison of demographic and clinical characteristics between the groups.

Parameters	Group C N = 50	Group OCH N = 50	p-value*
Age (years)	31.28 ± 5.18	29.26 ± 5.00	0.050
Weight before pregnancy (kg)	70.32 ± 16.08	65.90 ± 10.06	0.10
Total weight gained (kg)	13.17 ± 6.02	11.65 ± 6.33	0.2
BMI	31.17 ± 5.23	29.71 ± 3.76	0.11
Gestation (week)	38.12 ± 0.59	38.24 ± 0.56	0.3
Gravida	2.76 ± 1.32	2.56 ± 1.66	0.5
Parity	1.24 ± 0.89	1.04 ± 0.97	0.3
Abortus	0.50 ± 0.84	0.54 ± 1.11	0.8
Gender			0.3
Girl	21.00 (42.00%)	26.00 (52.00%)	
Boy	29.00 (58.00%)	24.00 (48.00%)	
Weight of the newborn (kg)	3,296.40 ± 411.69	3,226.20 ± 327.28	0.3
Apgar score_1	8.04 ± 0.20	8.10 ± 0.30	0.2
Apgar score_5	9.04 ± 0.20	9.10 ± 0.30	0.2
Duration of operation (min)	33.60 ± 8.47	30.32 ± 6.61	0.033
ACSA (cm^2)	13.81 ± 7.18	16.98 ± 8.62	0.048
GV (mL)	188.58 ± 104.59	237.49 ± 125.87	0.037
Administered ephedrine (mg)	22.40 ± 10.70	27.10 ± 10.65	0.030
Preoperative mean heart rate (beats/min)	97.42 ± 16.39	99.96 ± 13.83	0.4
Preoperative map (mmHg)	95.52 ± 9.40	93.08 ± 9.25	0.2
Incidence of hypotension	4.26 ± 1.85	5.56 ± 2.61	0.11
Amount of bleeding (mL)	306.00 ± 55.00	302.00 ± 73.51	0.8
Duration of operation (min)	33.60 ± 8.47	30.32 ± 6.61	0.033
Clamping time (sec)	9.68 ± 2.87	9.06 ± 2.57	0.3
Preoperative blood glucose (mg/dL)	74.06 ± 9.40	73.91 ± 12.83	>0.94
Birth time (min)	7.58 ± 3.52	`6.48 ± 3.42	0.12

*Data shown as Mean ± SD; n(%). *Welch Two Sample t-test; Pearson's Chi-square test.*

Table II: Sensation of breast fullness of the groups.

Parameters	Control, N = 50	OCH, N = 50	p-value*
Sensation of breast fullness	15.00 (30.00%)	29.00 (58.00%)	0.05
Sensation time of breast fullness postoperatively (hour)	12.93 ± 5.80	10.72 ± 5.98	0.2

**Welch Two Sample t-test; Pearson's Chi-square test.*

Table III: Comparison of postoperative quality of recovery (QoR)-10 scores between research groups.

Parameters	24th hour			Day 3rd			Day 7th		
	C	OCH	p-value*	C	OCH	p-value*	C	OCH	p-value*
Physical comfort	28.34 ± 3.5	28.40 ± 3.10	0.911	29.56 ± 1.03	29.66 ± 1.29	0.853	29.36 ± 4.24	29.82 ± 0.9	0.393
Emotional status	8.34 ± 2.48	8.38 ± 2.03	0.893	9.46 ± 1.46	9.76 ± 0.80	0.314	9.84 ± 0.47	9.98 ± 0.14	0.638
Physical independence	38.84 ± 10.89	38.66 ± 10.46	0.899	47.16 ± 4.77	46.96 ± 6.35	0.888	48.98 ± 2.45	49.38 ± 1.89	0.778
Pain	4.56 ± 2.79	4.74 ± 2.74	0.672	7.8 ± 2.17	7.74 ± 2.05	0.888	9.02 ± 1.15	8.98 ± 1.29	0.925
Total score	80.08 ± 15.58	80.18 ± 14.6	0.961	93.98 ± 7.45	94.12 ± 8.86	0.945	97.2 ± 5.16	98.16 ± 3.18	0.639

p-value: Postoperative comparisons of outcomes between the groups at different time points by least squares means. OCH: Oral carbohydrate, C: Control.*

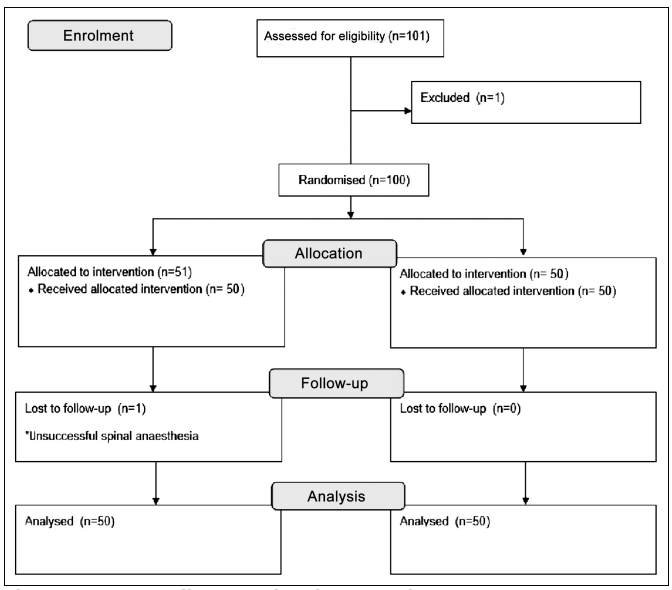

Figure 1: Consort diagram of patient recruitment.

When asked about the sensation of fullness in their breasts 24 hours after the operation before discharge, the Group OCH showed a statistically significant difference (p = 0.05). During the first 24 hours after surgery, 15 (30%) of mothers in Group C experienced a sensation of breast fullness, while this percentage was 29 (58%) in the Group OCH (p >0.05). When comparing the sensation time of breast fullness, the Group OCH sensed it earlier, although there was no significant difference between the groups (p = 0.2). Table II displays the sensation of breast fullness.

The QoR-10 scored patient-reported health status in the categories of physical comfort, emotional well-being, physical independence, and pain. Nausea or vomiting, dizziness, and shivering were assessed as indicators of physical discomfort. Physical independence was assessed based on the capacity to move without help, handle the baby independently, breastfeed autonomously, and fulfill toilet and hygiene requirements without assistance. Being conscious of one's control over the current circumstance was determined as an emotional state. According to these results, there were no significant differences between the preoperative and postoperative global and dimension scores of the groups (p >0.05). The postoperative global QoR-10 scores at the 24th hour were 80.08 ± 15.58 for Group C and 80.18 ± 14.6 for Group OCH.

Furthermore, there was no significant difference in the outcomes on the third and seventh days (Table III).

DISCUSSION

This prospective, randomised, double-blind study demonstrated that there were no differences in the quality of recovery, as evaluated by ObsQoR-10 scores, between parturients undergoing elective caesarean delivery after consumption of carbohydrate-rich fluid compared to the control group at 24 hours, 3 days, and 7 days after surgery. In addition, the VAS scores and opioid consumption of parturients were similar between the two groups. However, parturients consuming carbohydrate-rich fluid reported higher breast fullness and needed less intraoperative ephedrine.

During the early postoperative period, parturients are recuperating from a significant surgical procedure, which is known to result in an elevated metabolic demand similar to that of physical activity. Additionally, they are responsible for caring for their newborn and maybe breastfeeding. Scientific research indicates that engaging in exercise while lacking carbohydrates reduces physical performance.[1] Consequently, a compromised recovery from surgery can also be anticipated. Therefore, effective preoperative interventions could accelerate recovery postoperatively and decrease surgical complications.

The enhanced recovery after surgery (ERAS) is a comprehensive and multimodal protocol aimed at improving the recovery of patients after surgery across the whole perioperative period. The universal principles present in all ERAS regimens include preoperative education and optimisation, intraoperative use of multimodal anaesthetic approaches to decrease opioid consumption and maintain euvolaemia, and postoperative early mobilisation, nourishment, and removal of tubes and drains.[9] Effective implementation of the enhanced recovery after caesarean (ERAC) protocol necessitates the participation of various stakeholders from different disciplines, such as obstetrics, anaesthesia, nursing, lactation, and social work. The prompt recovery of the mother, with providing analgesia in the postoperative period, is very important for her early rehabilitation, the care of her infant, and breastfeeding. One of the components of ERAC is preoperative consumption of carbohydrate-rich beverages, besides postoperative protocols including postoperative pain management strategies to provide effective analgesia. Due to the limited hospital conditions where the authors conducted the study, the ERAC protocol could not be fully applied. Therefore, this study was planned mainly to discover the effect of preoperative oral carbohydrate-rich fluid on the patient's recovery process during the short-and long-term post-operative period using the patient-centered inquiry technique.

Kleimen *et al.*, in their study of 256 series, compared opioid use and pain assessment in the group with fully applied and without the ERAS protocol. According to their results, the implementation of the ERAS protocol led to a significant decrease in the opioid consumption of patients after surgery. Additionally, they observed a notable decrease in the highest pain scores following the introduction of ERAS protocol. However, there were no significant differences in the average pain scores during the patient's hospital stay.[10] In another study, parturients undergoing elective caesarean delivery were compared before and after the application of the post-surgical recovery regimen (ERAS). Institutional implementation of the ERAS regimen provided consumption of fewer opioid medications and lower pain scores compared to times before the ERAS protocol was utilised.[11] In the present study, both groups of patients' pain scores and opioid consumptions were similar. In a recent study, only some aspects of the ERAS protocol related to prenatal, intraoperative, and postoperative care could be implemented. Also, these elements may have a collective impact on pain management. Spinal and epidural anaesthesia induces sympathectomy, which causes vasodilation and thus, may lead to decreases in the blood pressure.

This is potentially the most prevalent and significant adverse effect experienced by the mothers after neuraxial anaesthesia.[9] In their study, Kotfis *et al.* assessed the occurrence and intensity of nausea and vomiting during the perioperative period in two the groups who consumed OCH or standard fasting before elective caesarean section under spinal anaesthesia. They also compared biochemical parameters indicating ketosis in mothers and their children. However, no significant differences were observed between the parameters of these groups.[12] In another study, no difference was seen in the occurrence of perioperative hypotension, hypertension, bradycardia, nausea, and vomiting episodes between the group receiving OCH and the group receiving water in elective caesarean section cases.[13] According to the findings of the present study, no significant variations were determined among the groups in terms of the occurrence of hypotension, heart rate, and MAP data. The amount of vasopressor administered during the surgical procedure was higher in the OCH group. This may be attributed to relative hypovolaemia caused by the water consumption during the degradation of the carbohydrate and diuresis needed to remove waste products formed during this degradation.

The World Health Organization (WHO) recommends early initiation of breastfeeding (EIBF), which involves providing mothers' breast milk to infants within the first hour of life. This approach has been suggested as a means to decrease the mortality rate of the newborns.[14] Hadisuyatmana *et al*. investigated and reviewed the factors influencing the EIBF and the promotion of women's empowerment.[15] In many studies mentioned in this review, one of the determinants of the lack of early breastfeeding was reported to be caesarean section.[16] A pilot study aimed to investigate the correlation between intravenous fluids administered to parturient during the peripartum period and the occurrence of postpartum breast oedema. The study involved primiparous parturients who had spontaneous vaginal delivery. The researchers used the oedema rating scale and maternal breast self-assessment scale to evaluate the participants. They found that those who received intravenous fluids during labour and postpartum, experienced increased breast oedema.[17] The present study focused on elective caesarean section cases and revealed a significantly higher incidence of breast fullness and tenderness in the postoperative period among the parturients in the Group OCH. In this study, the evaluation of tenderness and fullness was made *via* maternal self-assessment, without employing a quantitative scale. As studies mentioned, EIBF following a caesarean section can present difficulties. Nevertheless, the feeling of breast volume increase and tenderness through preoperative OCH consumption may serve as a further motivation for the mother to initiate breastfeeding promptly. Several studies in the literature have investigated the impact of consuming OCH before elective caesarean section on clinical and biochemical outcomes. In one study conducted by Sharma *et al.*, the OCH group had lower levels of hunger, thirst, and Beck's anxiety scores. The dominant hand grip strength of the mothers did not differ between the groups in the same investigation.[13] Additionaly, another study comparing the insulin resistance (IR) across the fasting, placebo, and OCH

groups reported that IR was significantly higher in the fasting and placebo groups *versus* the OCH group.[18] It was also determined whether preoperative OCH loading had an impact on the mothers' thiols and ischaemia-modified albumin (IMA) levels, which are the indicators of tissue damage from reactive oxygen species and detoxifiers. According to the results, these indicators were unaffected by preoperative OCH loading.[19] The results of this study are consistent with the previous three studies stated, as no significant differences were observed in preoperative haemodynamic responses, stomach volume, ACSA values, neonatal parameters, and Apgar scores of the newborns. In the past few years, multiple translated versions of Obs QoR10 have been created and validated after the release of the original English version.[5,20] A study by Yusuke *et al*. examined the progression of QoR 10 daily observations in 98 nulliparous parturients who underwent spontaneous vaginal birth or elective caesarean section with spinal anaesthesia. This study revealed that planned caesarean section (CD) had a longer recovery period than spontaneous vaginal delivery (SVD), with recovery plateau periods of 4 and 3 days, respectively. No significant difference in the quality of recovery was found between delivery methods after the third day.[21] A study involving 215 parturients undergoing vaginal *vs*. caesarean delivery, evaluated with ObsQoR 10 within the first 72 hours postpartum, found significantly higher recovery scores after vaginal birth. The study also categorised vaginal and caesarean births into spontaneous, induced, scheduled, and unplanned subgroups, comparing their scores, which were found to be similar.[22] In a different research study that examined scheduled and unplanned caesarean sections, the scores at the 24th and 48th hours, and the 1st week after childbirth were compared, and no difference was found.[23] A multi-centric study was conducted, involving 107 obstetric units, to evaluate the scores of caesarean section, instrumental, and spontaneous vaginal birth on 1st and 30th day following delivery. The study found that the scores after caesarean section were lower.[24] The main focus of this investigation was the impact of OCH consumption prior to caesarean delivery on postoperative recovery scores. There were no significant differences between the groups in terms of the scores for physical comfort, emotional status, physical independence, and overall scores, which encompassed all ObsQoR categories. These results, in contrast to the authors' hypothesis, may be attributed to postpartum recovery, which may include many factors such as sleep quality and motherhood experience, besides the parameters of ObsQoR-10. Furthermore, the implementation of other factors preventing shivering and optimising independent care beyond the functioning ERAS protocol may lead to different results.

There are some limitations in the present investigation. Due to the exclusion of parturients with obesity, gestational diabetes mellitus, preeclampsia, reflux, hiatal hernia, or those undergoing general anaesthesia, the study's results may not be universally applicable to all parturiants. The taste of the two beverages varied, making strict double-blinding challenging. Nevertheless, the authors tried to enable participant blinding by using opaque bottles and drinking out of them through a straw with the help of nurses. Ultimately, the authors only examined a single category of complex carbohydrate, which did not encompass all clear liquids available for consumption. Therefore, the authors cannot confirm that the optimal liquid is the one analysed in this study. Furthermore, during the preoperative period, there was no inquiry about the patients' hunger and thirst status. There were no questions about the timing of postoperative flatulence in mothers. The assessment about the recovery was based on subjective data, and any objective biochemical analysis, such as lactate and CO_2, were used in this research. The current study's strength is that it is the first in the literature to examine how pre-caesarean carbohydrate consumption affects ObsQoR 10 scores. Further additional research is needed to declare this issue.

CONCLUSION

Based on these findings, it could be concluded that it is safe for parturients to consume clear fluids or nonparticulate OCH drinks up to 2 hours before undergoing surgery. Mothers who concentrate on baby care following a caesarean section must ensure prompt lactation and exclusively breastfeed their infants, avoiding the use of formula. To achieve this purpose, it suggests that the increased breast fullness and tenderness observed in the OCH group may play a significant role in encouraging postoperative moms to breastfeed. While OCH beverages did not have a noteworthy impact on ObsQoR, conducting further additional research on this topic is recommended.

ETHICAL APPROVAL:
The study was conducted after obtaining approval from the Ethics Committee of Karamanoglu Mehmetbey University, Faculty of Medicine, with approval number 10-2022/16.

PATIENTS' CONSENT:
Signed informed consent forms were obtained from all participants.

COMPETING INTEREST:
The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:
OD, BB: Contributed to the writing of the manuscript, designed the study, collected data, analysed the results, and provided clinical expertise.
Both authors approved the final version of the manuscript to be published.

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