Obstetrical and Pediatric Anesthesia

Audit of an early feeding program after Cesarean delivery: patient wellbeing is increased

[Audit d'un programme d'alimentation précoce post-césarienne : bien-être accru des patientes]

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Purpose: Early feeding is well tolerated after Cesarean delivery. However, patient wellbeing and nurses' attitudes toward implementation of early feeding have rarely been investigated.

Methods: A quality-assurance program of 18 months duration was implemented because evaluation of traditional practice demonstrated significant deficiencies (phase I). Drinking was then allowed within one hour and feeding within six to eight hours after delivery. Gradual dietary expansion followed according to a detailed program. Three consecutive evaluations (phase II–IV) were performed: 1) to measure implementation by the ward nurses; 2) to record the type of food and the volume of water effectively received; 3) to evaluate patients' gastrointestinal tolerance and patients' levels of hunger and thirst and patients' overall satisfaction.

Results: In phase I, 60% of patients received nothing by mouth and 28% received only water on the day of surgery (D0). Moderate or severe hunger and thirst were seen in a large portion of these patients (D0, hunger: 38%, thirst: 63%, D1, hunger: 40%, thirst: 28%). Introduction of the program significantly improved patient wellbeing as well as patient satisfaction. No side effects were encountered.

Conclusion: Hunger and thirst are frequently encountered after Cesarean delivery when patients are allowed to eat only after return of the first flatus. By using a quality-assurance program, it was possible to reduce the incidence and the severity of these distressing symptoms and to improve patients' satisfaction while no side effects were encountered. These beneficial effects were maintained in phase IV suggesting a high acceptance rate from the nursing staff.

Objectif : *La reprise d'une alimentation précoce est bien tolérée après une césarienne. Nous avons évalué le confort des opérées et l'attitude du personnel soignant par rapport à un protocole d'alimentation précoce.*

Méthode : *L'évaluation de la pratique traditionnelle locale a mis en évidence des insuffisances importantes (phase I). En conséquence, l'apport de boissons a été accepté dans l'heure suivant la fin de la césarienne et l'alimentation dans les six à huit heures. Un retour progressif vers une alimentation normale a été organisé grâce à un programme diététique détaillé. Trois évaluations consécutives (phases II–IV) ont été réalisées pour : 1) suivre la mise en œuvre du programme de réalimentation précoce par le personnel soignant; 2) enregistrer le type de nourriture et la quantité d'eau reçus; 3) évaluer la tolérance digestive, le degré de faim et de soif ainsi que le degré de satisfaction des patientes au cours des quatre premiers jours postopératoires.*

Résultats : *Au cours de la phase I, 60 % des opérées n'ont rien reçu par la bouche et 28 % ont été autorisées à boire uniquement de l'eau le jour de l'intervention (J0). Une incidence élevée de patientes ayant une faim et une soif importantes était enregistrée le jour de l'intervention (J0 : faim : 38 %, soif : 63 %) et le premier jour postopératoire (J1 : faim : 40 %, soif : 28 %). L'introduction du programme a permis une réduction de ces symptômes et a amélioré significativement la satisfaction des opérées. Aucun effet indésirable notable n'a été enregistré.*

Conclusion : *La faim et la soif sont des symptômes fréquents et gênants après une césarienne lorsque les opérées ne sont réalimentées qu'après la reprise du transit digestif. Par la mise en œuvre d'un programme d'assurance-qualité, il a été possible de réduire l'incidence de ces symptômes et d'améliorer la satisfaction des patientes sans effet indésirable gênant et avec un haut degré d'acceptation par le personnel soignant.*

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Accepted for publication August 15, 2001.

Revision accepted June 10, 2002.

IN recent years, traditional management of postoperative ileus has been challenged both after surgery of the gastrointestinal tract and after Cesarean delivery. Several recent prospective studies have demonstrated that after Cesarean delivery early administration of food and water is well tolerated and is associated with a more rapid return to a normal diet, thus reducing length of hospital stay.[1–5] However, in only one of these studies[3] were patients interviewed to evaluate their satisfaction. Moreover, no real estimates of food and water intake were obtained and patients' thirst and hunger were not measured. Finally, although the previously mentioned studies[1–5] have shown the feasibility of early oral feeding, many units still remain reluctant to modify their own practice.[6] The goals of the present study performed using the model of a quality-assurance program, were at least two-fold: 1) to determine the extent of patients' hunger and thirst before and after implementation of an early feeding and drinking program; 2) to evaluate the hospital personnel's compliance with changes in its traditional methods of postoperative care.

Methods

The present program consisted of four consecutive phases with an overall duration of 18 months and followed a quality-assurance program devoted to postoperative analgesia after Cesarean delivery.[7] Except for patients transferred postoperatively to the surgical intensive care unit, all Cesarean deliveries were included. During phase I (from August 10 to October 10, 1996), no attempt was made to modify established attitudes. The personnel of the maternity unit (obstetricians, nurses and other nonmedical staff personnel) were left unaware of the evaluation in order to obtain a precise picture of the existing situation. However, the basic principles of this study had been approved by the Chairman of the Obstetric Department. Because previous studies have shown that implementation of a program providing early feeding does not pose a threat to Cesarean delivery patients, Ethical Committee approval was not deemed necessary. This study was however performed under the auspices of the Commission on Evaluation and Quality of Care of the hospital.

During phase I (and before), initiation of feeding was guided by the ward nurses. Water and the first food intake were not allowed during the first 24 hr and food was limited to light diet only. A solid diet was permitted after the first flatus was passed if nausea or vomiting had not occurred during this period. Women were allowed to choose the content of their meals only after ensuring that a normal diet could be tolerated.

Because important deficiencies (see results) were observed during the conservative phase (phase I) of the program, a protocol of early feeding was prepared by a dietician (C.B.) to ensure that a normal diet was given at the third meal at the latest. This protocol allowed administration of clear water in the postanesthesia care unit (PACU) within one hour and solid food within six to eight hours after the end of the procedure. Patients were allowed to choose the content of their meals. A standardized form describing the general rules and the contents of each meal for the first three postoperative days was attached to the postoperative drug order. Results of patients' interviews obtained during phase I were presented to and discussed with the personnel of the maternity unit.

Phase II (from December 9, 1996 to February 14, 1997) evaluated implementation of the new protocol but personnel of the maternity unit was now aware of the ongoing evaluation. Data obtained during this phase showed almost immediate implementation of the program and this was associated with increased patient satisfaction (see results). However significant failure to implement early drinking required a phase III study. Hospital personnel were again brought together to present data of phase II and to emphasize the importance of early drinking. The standardized protocol was slightly modified to state more clearly that early drinking should be encouraged.

Phase III (from April 1 to June 16, 1997) was based on the same principles as phase II and again the personnel of the maternity was aware of the evaluation. Data obtained from patients and nurses during phase III were very satisfactory. Because initial success of a program has been followed in previous studies by a gradual return to the pre-program situation,[8] a phase IV study was constructed three months later (from September 5 to September 29, 1997). During this period, no further encouragement (except for the continuing use of the standardized menu order) was given to the personnel and phase IV evaluation was performed in a blinded manner to avoid audit-related improvements.

Evaluation of the patients' food and water intake was performed daily during the first five days after delivery. An anesthesiologist (M.T.) interviewed all women on the ward each morning and reviewed the patients' charts to detect any deviations from the program. The following variables were recorded: time to first water/food intake, hunger and thirst felt during the previous 24 hr using a 0–3 verbal scale (0 = no hunger or no thirst; 1 = mild; 2 = moderate; 3 =

TABLE I Consumption of food and liquids in the four phases of the program

	Phase I *n = 53*	*Phase II* *n = 79*	*Phase III* *n = 60*	*Phase IV* *n = 29*
First normal meal*	8 ± 1†	4 ± 0.5	4 ± 1	4 ± 1
Extra-food or extra-drink on day 0 (% pts)	13	15	1.7‡	0‡
Water ingested in PACU (mL)	6 ± 5	58 ± 41	177 ± 141‡	152 ±168‡
Water ingested on the ward (mL)				
- Day 0§	257 ± 52	772 ± 229¶	1048 ± 575¶	1100 ± 544
- Day 1	537 ± 318	1047 ± 421¶	1243 ± 468¶	1206 ± 511
- Day 2	1020 ± 378	1217 ± 517	1386 ± 495	1213 ± 589
- Day 3	1157 ± 458	1325 ± 486	1366 ± 444	1325 ± 621
- Day 4	1384 ± 632	1305 ± 507	1400 ± 487	1328 ± 363
Food, day 0 (% pts)				
- None	8†	1	2	0
- Light diet	92	99	88	83
- Normal diet	0	0	10	17
Food, day 1 (% pts)				
- None	0†	0	2	0
- Light diet	89	2	0	0
- Normal diet	11	98	98	100
Protocol implemented (% pts)				
- Fully		75	88	93¶
- With delay		22	10	7
- Too early		3	2	0

*Delay between Cesarean delivery and provision of the first meal with a normal diet, expressed as the number of meals (± SD) given during this interval. One day corresponds to three meals. †$P < 0.05$ *vs* other phases; ‡$P < 0.05$ *vs* phase I and phase II; §Excluding the volume ingested in the postanesthesia care unit; ¶$P < 0.05$ *vs* earlier phase.

TABLE II Gastrointestinal symptoms and patient satisfaction

	Phase I *n = 53*	*Phase II* *n = 79*	*Phase III* *n = 60*	*Phase IV* *n = 29*
Nausea, day 0 (% pts)	6	14	17	10
Vomiting, day 0 (% pts)	9	10	5	4
Time to first flatus (hr)	18 ± 9	17 ± 7	22 ± 10*	19 ± 6
Time to first stool (hr)	80 ± 27†	68 ± 18†	102 ± 23*†	52 ± 3†
Satisfaction VAS (0–100 mm)	79 ± 8	88 ± 11‡	89 ± 6‡	92 ± 6‡

*$P < 0.05$ *vs* phase I and phase II; †$P < 0.05$ *vs* other phases; ‡$P < 0.05$ *vs* phase I. VAS = visual analogue scale.

severe). Extra food and drink brought to the patient by her family were recorded. Time to first flatus and to first stools (interval between surgery and flatus/stools in hours) was also recorded. Nausea and vomiting that occurred in the previous 24 hr were also evaluated using a similar (0–3) verbal scale. The computer-printed menus of the last 24 hr were collected and compared to theoretical requirements. The amount of fluids ingested each day was recorded as well as the amount of food ingested by the patient at each meal ("complete" suggests that all the food provided in the meal had been eaten and "partial" identified meals that had been only partially eaten). Maternal satisfaction using a 0–100 mm verbal numeric scale (where 0 represents complete dissatisfaction and 100 represents complete satisfaction) was recorded at the end of the five-day evaluation.[9]

Data are presented as mean ± SD or median (range) for data which are not normally distributed. Statistical analysis was performed using ANOVA or chi square analysis with or without Bonferroni corrections as appropriate. $P < 0.05$ was considered significant.

Results

Two hundred and twenty-one patients were recruited in the four parts of this program. Overall, 29% of them had elective Cesarean delivery and general anesthesia was performed in 16% of cases. Mothers breastfed their neonates in 58% of cases. General comparison of the four phases does not display any significant difference.

In phase I (i.e., before implementation of the program), the first meal with a completely normal diet was obtained on the eighth meal (Table I). Ninety-two percent of patients received a light diet and 8% received only water on the day of surgery (D0, Table I). Thirty-eight percent of patients experienced moderate or severe hunger (Figure 1-A) and 63% of them moderate or severe thirst on the day of surgery (Figure 1-B). There was no difference in the incidence or severity of hunger and thirst among elective or emergency Cesarean delivery patients. On D1, similar results were obtained for hunger (40% moderate or severe hunger) while significant thirst was less frequently encountered (28%). No patient could choose her menu before the fifth meal in phase I (Figure 2). For 13% of our patients, additional food and/or drink was brought by the family. Six percent of patients had access to water in the PACU in phase I. First flatus occurred after a mean delay of 18 ± 9 hr while patients passed their first stool 80 ± 27 hr after surgery. On the day of surgery (D0) nausea was observed in 6% and vomiting in 9% of patients. The mean amount of water drunk by patients on the day of surgery (D0) was 257 ± 52 mL and 537 ± 318 mL on the first postoperative day (D1).

Introduction of the program resulted in many significant changes. Phase II patients had access to water in the PACU in 33% of cases and this increased to 85% of cases in phase III ($P < 0.001$ *vs* phase I). The mean volume of water that patients drunk during the first 24 hr increased from phase I to phase III ($P < 0.01$ *vs* phase I). Whereas 8% of patients received nothing by mouth on the day of surgery in phase I, this decreased dramatically after implementation of the program (1% and 2% for phases II and III respectively). From meal to meal, patients progressed to a regular diet (Table I). However a regular diet was given for the first time to patients of phase I significantly later than in phases II and III (Table I). Extra-food and drink were brought by families to 15.2% of patients in phase II and to 1.7% of phase III patients ($P < 0.008$ phase III *vs* phase II and phase I). Complete implementation of the program increased from phase II to phase III (74.7% *vs* 88.1%, $P = 0.01$). Patients were allowed by the hospital personnel to choose the content of their meal earlier in phase II and in phase III than in phase I (Figure I). Significantly

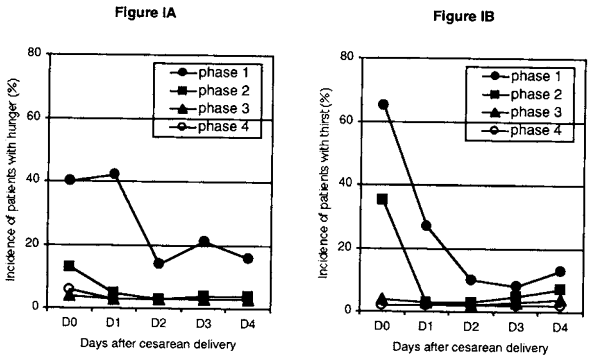

FIGURE 1 Incidence of patients experiencing important or extreme hunger (A) or important or extreme thirst (B) during the four phases of the program.

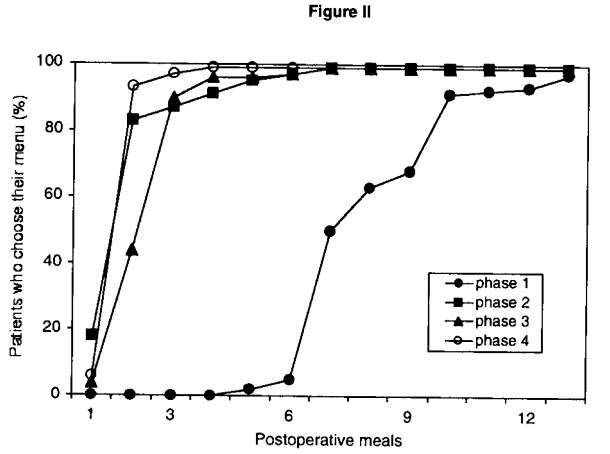

FIGURE 2 Cumulative percentage of patients who were given the opportunity to choose their menu in each of the four consecutive phases of the program.

fewer patients experienced hunger and thirst on the first two days after implementation of the program (Figure 1-A and 1-B). However the benefit was more difficult to obtain for thirst than for hunger. On the day of surgery, the incidence of patients with moderate or severe hunger declined to 10.0% (phase I *vs* phase II, $P < 0.001$) while the incidence of moderate or severe thirst was still at 30.4% (phase I *vs* phase II, $P < 0.001$). Implementation of phase III led to a significant reduction in the incidence of thirst (3.3% moderate or severe thirst). Patient satisfaction steadily increased from phase I to phase III (Table II).

A statistically but non clinically significant increase in the time to first flatus was seen in phase III but was not seen in phases II and IV (Table II). Similarly, the time to first stools increased significantly in phase III but this was observed neither in phase II nor in phase IV. Nausea and vomiting occurred with a similar incidence in all four phases (Table II).

Phase IV (designed to evaluate the long-term effect of the program) essentially demonstrated a continuing improvement in the implementation of the program while patient hunger and thirst and satisfaction all significantly improved when compared with phase III results (Tables I and II and Figures 1 and 2).

Discussion

Implementation of a program aimed at providing early feeding and drinking after Cesarean delivery was easily successful and its beneficial effects were maintained more than one year after its start suggesting a high acceptance rate from the nursing staff. Although the audit dated back from 1997, practical discussions with maternity staff and preliminary data from an ongoing long-term audit reassured us that there was no significant decline in the quality of the program. It was associated with no increase in gastrointestinal side effects, but was associated with almost complete disappearance of postoperative hunger and thirst, and resulted in significantly increased maternal satisfaction.

The anesthesiologist's traditional role is more oriented around procedures and intraoperative care but it is now often proposed that our role must extend into the postoperative period where it should not be limited solely to pain relief.[10,11] Indeed, many experts now believe that this change offers the best chances for the specialty to survive despite current threats and prosper.[12] Although our specialty may not commit to the totality of perioperative medicine and probably cannot include postoperative routine ward management because of demographic constraints, anesthesiologists are certainly among the best prepared specialists to understand most physiological derangements that occur in the postoperative period. Interactions between surgical trauma following abdominal surgery, patient dissatisfaction related to hunger and postoperative analgesic-induced nausea and vomiting or ileus are well known to anesthesiologists. Also, anesthesiologists are at the crossroads between surgeons and medical specialists, nurses and midwives and thus are in position to implement changes designed to improve patient care. This program is such an example of our expanding role in perioperative care.

This study was not performed to demonstrate the favourable risk/benefit ratio of the technique (because this has already been demonstrated)[1,5] but to evaluate if traditional reluctance to early feeding after Cesarean section can be easily overcome by a quality-assurance program.

Several reasons may explain why this program was successful. It is often stressed that a major factor in obtaining successful implementation is recognition of the dysfunctional status quo by people involved. Although the nurses who were in direct contact with patients did not initiate the program, they were well aware of the problems and accepted the proposed changes with enthusiasm. Their lack of initiative is probably related to the fact that early feeding after Cesarean delivery has only recently been evaluated in structured studies[1–5] although this had been said to be feasible a long time ago.[13] The success of the program is also probably related to the immediate increase in patient satisfaction and to the modest effort required by the hospital personnel. Education of the staff and provision of a written program (feeding order) for each patient probably played a significant role.[14] Finally, the program required more effort from nurses than from physicians and it is well known that nurses are more prone to adhere to guidelines than physicians who demonstrate resistance to guidelines.[15]

Phase IV was designed because a long-term decline in the implementation was suspected, following previous examples in the literature.[8] We found no such decline and, conversely, a continuing improvement was observed confirming the initial enthusiasm.

An interesting finding was that thirst was more a problem for patients than hunger. The incidence of significant thirst (qualified as moderate or severe) was greater than for hunger at each phase of the program. Moreover we noted that when patients asked their family for extra food, they were more often brought drinks or juicy fruits (such as oranges) than solid food.

No significant increase in gastrointestinal side effects was observed except for a transient and unexplained delay in the return of bowel function in phase III. The safety of early feeding has also been observed in most studies.[2–4] Time to first flatus was shorter in the present study than in most other evaluations. One possible explanation is that our analgesic regimen includes regular administration of non steroidal anti-inflammatory drugs (NSAIDs) during the first three days after Cesarean delivery. NSAIDs have indeed been shown to have beneficial effect on bowel motility through either their analgesic effect or the reduction of production of prostaglandin synthesis.[16]

In conclusion, this study has shown the successful implementation of an early feeding and drinking program after Cesarean delivery. Both hunger and thirst

were reduced and this led to increased patient satisfaction while no side effects were observed.

Acknowledgement

The authors wish to thank the personnel of the Gynecology and Obstetrics unit for their enthusiastic participation in the program.

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