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Fasting of less than eight hours in urgent and emergency surgeries *versus* complication

Jejum inferior a oito horas em cirurgias de urgência e emergência versus complicações

Ayuno inferior a ocho horas en cirugías de urgencia y emergencia versus las complicaciones intra y posoperatorias

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ABSTRACT

Objective: to verify the occurrence of intraoperative and postoperative complications in patients undergoing urgent and emergency surgical procedures between January and December 2012, with fasting time of less than 8 hours. **Method:** a quantitative study was conducted, of the retrospective cohort type, through the analysis of medical records. **Results:** we included 181 records of patients undergoing surgical procedures with average duration of 59.4 minutes. Fractures correction surgeries stood out, totalling 32% of cases. We observed complications in 36 patients (19.9%), vomiting being the most prevalent (47.2%); followed by nausea (16.7%); need for blood transfusion (13.9%); surgical site infection (11.1%); and death (11.1%). The average fasting time was 133.5 minutes. The fasting time showed no statistically significant correlation with the complications investigated. **Conclusion:** intraoperative and postoperative complications were associated with the clinical conditions of the patients and not with the fasting time.
Descriptors: Nursing; Perioperative Assistance; Fasting; Perioperative Nursing; Anesthesiology.

RESUMO

Objetivo: verificar a ocorrência de complicações intraoperatórias e pós-operatórias em pacientes submetidos a procedimentos cirúrgicos de urgência e emergência entre janeiro e dezembro de 2012, com tempo de jejum inferior a oito horas. **Método:** conduziu-se um estudo quantitativo, tipo coorte retrospectivo, por meio da análise de prontuários médicos. **Resultados:** foram incluídos 181 prontuários de pacientes submetidos a procedimentos cirúrgicos com duração média de 59,4 minutos, destacando-se a cirurgia de correção de fraturas em 32% dos casos. Foram observadas complicações em 36 (19,9%) dos pacientes, destacando-se o vômito (47,2%); seguido de náuseas (16,7%); necessidade de transfusão sanguínea (13,9%); infecção do sítio cirúrgico (11,1%); e óbito (11,1%). O tempo médio de jejum foi de 133,5 minutos. O tempo de jejum não apresentou correlação estatisticamente significante com as complicações investigadas. **Conclusão:** as complicações intraoperatórias e pós-operatórias estiveram associadas às condições clínicas dos pacientes e não ao tempo de jejum.
Descritores: Enfermagem; Assistência Perioperatória; Jejum; Enfermagem Perioperatória; Anestesiologia.

RESUMEN

Objetivo: verificar la ocurrencia de complicaciones intra y posoperatorias en pacientes sometidos a procedimientos quirúrgicos de urgencia y emergencia, entre enero y diciembre de 2012, con tiempo de ayuno inferior a ocho horas. **Método**: estudio cuantitativo, de tipo corte retrospectivo, utilizando fichas médicas para análisis. **Resultados**: se incluyeron 181 fichas de pacientes sometidos a procedimientos quirúrgicos con promedio de duración de 59,4 minutos, el 32% de los casos fueron de cirugía de corrección de fracturas. Se observaron complicaciones en 36 pacientes (19,9%), destacando en primer lugar el vómito (47,2%);

después las náuseas (16,7%); la necesidad de transfusión sanguínea (13,9%); la infección del centro quirúrgico (11,1%); y fallecimiento (11,1%). El promedio del tiempo de ayuno fue de 133,5 minutos. El promedio de ayuno no presentó correlación estadísticamente significativa con las complicaciones evaluadas. **Conclusión**: las complicaciones intra y posoperatorias no estuvieron asociadas al tiempo de ayuno de los pacientes, sino a las condiciones clínicas de ellos.
Descriptores: Enfermería; Cuidado Perioperatorio; Ayuno; Enfermería Perioperatoria; Anestesiología.

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INTRODUCTION

The preoperative fasting of liquids and solid foods during periods of eight to 12 hours, often still practiced, aims to ensure gastric emptying, preventing patient's pulmonary aspiration during surgery[1-2]. This procedure was initiated from the observations made by Mendelson in 1946, which established correlation between nutrition and pulmonary aspiration of gastric contents[3].

The preoperative fasting is a widely accepted practice among surgeon physicians and anesthesiologists, and is still prevalent among hospital institutions that perform surgical procedures, in some situations reaching the periods of over 12 hours due to a delay in surgical schedule and/or suspension of surgeries, for example[4-5].

Therefore, fasting generates anxiety and discomfort to patients and may be related to metabolic complications, such as the emergence of insulin resistance (IR) associated with postoperative hyperglycemia by decreasing the availability of insulin to the peripheral tissues and difficulty of glucose uptake. This process occurs, mainly, in the early days after surgery and is caused by various physiological factors linked to prolonged preoperative fasting and reduction of carbohydrate intake, negatively affecting the results of surgical recovery, increasing risk of infections and slowing cicatrization[1-2,6-9].

Thus, the traditional practice of fasting has been questioned, suggesting its reduction by implementing new institutional multiprofessional protocols, aiming to reduce the time of deprivation of food, thus getting consistent improvement in the postoperative recovery[10].

These aspects began to be discussed mainly in 1990s, from the implementation of a multimodal protocol for colorectal surgery called Enhanced Recovery After Surgery (ERAS), which aimed to improve postoperative recovery through preoperative measures as: optimization of nutritional aspects, implementing solutions rich in carbohydrates; analgesic and anesthetic standardized practices, which reduce postoperative pain; and early postoperative mobilization[11-12]. Currently, this protocol has been used in various surgical specialties[11,13].

In Brazil, based on the ERAS project, the University Hospital linked to the Federal University of Mato Grosso started a project called "Acceleration of Total Postoperative Recovery" (ACERTO), implementing a series of measures that sought comfort and optimization of postoperative recovery of patients. These measures included: offering of a maltodextrin solution up to 2 hours before the surgical procedure[2-3]; non performance of preoperative colon preparation, reducing insertion of probes and drains; stimulation of early ambulation after surgery; and restriction of intravenous fluids. It is worth emphasizing that all the interventions mentioned are implemented by a multidisciplinary team, with the involvement of nurses and nutritionists[10,14-16].

The supply of fluids to the patient preoperatively brings improvement in well-being and physiological functions, reducing insulin resistance, hunger and thirst before surgery, reflecting positively in the postoperative period, with the decrease in recovery time after surgery, rapid return of intestinal functions, better glycemic control, decrease of surgical site infections and postoperative morbidity and mortality rates, and consequently of the length of hospitalization[2,8,10,14].

Despite the advantages mentioned above, the implementation of this protocol, in particular the reduction of the time of preoperative fasting, still meets resistance even in face of scientific evidence pointing to the security of the practice[4].

However, even in health institutions that did not deploy any of the items of the mentioned protocols, often, albeit unintentionally, the period of fasting was reduced when the health conditions of patients require urgent and emergency surgical procedures. Therefore, although not intentionally, this practice would be related to a greater number of complications linked to the absence of complete gastric emptying due to reduction of fasting time?

Thus, this study aimed to verify the occurrence of intraoperative and postoperative complications in surgical patients undergoing urgent and emergency procedures who did not undergo the traditional preoperative fasting of 8 hours; and, as specific objectives, to describe the sociodemographic and surgical characteristics of patients subjected to urgent and emergency surgeries with fasting time of less than 8 hours and check the association between the variable fasting time and the nausea, vomiting and aspiration pneumonia, blood transfusion, surgical site infection, and death.

METHOD

This is a quantitative study, of the retrospective cohort type, accomplished by consulting the medical records of patients who underwent urgent and emergency surgeries between January and December 2012. The project was approved by the Research Ethics Committee according to Resolution 466/2012 of the National Health Council[17], after authorization of the hospitals selected to study. An informed consent form was dismissed since the data were collected through medical records.

We opted for a convenience sampling, including medical records of patients with fasting period of less than 8 hours, who underwent urgent and emergency surgeries between

January and December 2012, in two charitable hospitals affiliated to the Brazilian Unified Health System (SUS), located in the state of São Paulo, in the region of Vale do Paraíba, which receive urgent and emergency cases.

The data were collected from medical records in the second half of 2013 through a data collection instrument, of the checklist type, containing information such as: patient's initials, number of the record, date of hospitalization, date of surgery, type of surgery, fasting time from hospital admission or last food intake registered in the record, occurrence of complications such as changes in the glycemic index, in intraoperative laboratory tests, respiratory changes, and nausea and vomiting presented intraoperatively and postoperatively.

The instrument was referred to apparent and content validation to three experts in the field of surgical nursing and urgencies and emergencies, who evaluated the instrument concerning the relevance of the contents listed and its ability to achieve the objectives proposed in the investigation. We complied with the small changes suggested[18].

The following were considered as dependent variables in this study: nausea, vomiting, and aspiration pneumonia. As possible interest variables, we also evaluated the need for postoperative blood transfusion, surgical site infection diagnozed during hospitalization, and death during hospitalization. These outcomes were selected by their relationship with the presence of food in the gastrointestinal tract and/or for appearing in studies concerning this theme[2,8,10,14].

The analysis of the data was performed in a descriptive and inferential way, with presentation of results by means of frequency distribution, arithmetic mean, standard deviation, median, and minimum and maximum values for the quantitative variables. We employed in the evaluation of variables association Fisher's exact test (for the categorical variables) and Mann Whitney test (for continuous variables). We used the technique of double data entry. The significance level adopted was $\alpha = 0.05\%$.

RESULTS

Characterization of the sample

We analyzed 181 medical records of patients who underwent urgent and emergency surgeries, with average fasting time of 122.7 minutes and standard deviation of 111.8 minutes. There was variation between complete absence of fasting and the maximum time of 440 minutes.

Regarding the characterization of the subjects included in this study, it is possible to observed in Table 1 that, among the 181 records reviewed, most individuals were female, with an average age of 31 years, subjected to hospitalization with an average duration of 2.6 days and average surgical time of 59.4 minutes.

Table 1 – Distribution of characterization and perioperative variables of the investigated subjects, São Paulo, Brazil, 2013

Variables	Number (%)	Mean/Median ± Standard Deviation (SD)	Minimum–Maximum
Sex			
Female	101 (55.8)		
Male	80 (44.2)		
Age (years)		31/27 ± 18.4	2–91
Use of catheter			
Bladder (delay)	67 (37.0)		
Bladder (relief)	27 (14.9)		
Nasogastric	7 (3.9)		
Use of drains			
Portovac	2 (1.1)		
Penrose	4 (2.2)		
Hospitalization time (days)		2.6/2.0 ± 2.3	1–18
Surgery time (minutes)		59.4/45.0 ± 48.5	10–245
Intraoperative infusion volume (ml)		970.5/1000.0 ± 557.5	100–3500
Fasting time (minutes)		122.7/85.0 ± 111.8	0–440
Glycemic Index		101/99.0 ± 18.6	83–120

Only 1.62% of patient records contained information on the glycemic index, being two cases in the preoperative period and only one during the intraoperative period.

The surgery performed with urgency and emergency that stood out the most was fractures correction, with 58 cases (32.0%); followed by cesarean section, with 45 cases (24.9%); and appendectomy, with 27 cases (15.0%).

Analysis of fasting time and complications

Among the 181 subject analyzed, only 36 cases (19.9%) had post-surgical complications, especially those related to the gastrointestinal system, i.e., nausea and vomiting, which represented 12.7% of the patients studied.

Among the 36 patients who presented some of the investigated complications, the average fasting time was 133.5 minutes, with maximum time of 283.7and minimum of 47.5 minutes.

Among the postoperative complications noted, the most frequent were vomiting (47.2% of cases); followed by nausea (16.7%) (Table 2). None of the analyzed patients had medical diagnosis or signs and symptoms of aspiration pneumonia registered in the medical records.

There was no statistically significant association between the variable fasting time and the vomiting ($p = 0.661$), nausea ($p = 0.105$), need for blood transfusion ($p = 0.147$), surgical site infection ($p = 0.073$), and death ($p = 0.136$) (Table 2).

Table 2 – Distribution of the subjects investigated regarding the presence of complications and their association to fasting time, São Paulo, Brazil, 2013

Complication	n (%)	Fasting time			*p* value
		Mean (minutes)	Median (minutes)	Standard Deviation (minutes)	
Vomit	17 (47.2)	140.0	90.0	136.2	0.661
Nausea	6 (16.7)	57.5	47.5	35.6	0.105
Blood transfusion	5 (13.9)	58.3	62.5	53.0	0.147
Surgical site infection	4 (11.1)	47.5	35.0	51.2	0.073
Death	4 (11.1)	283.7	327.5	202.8	0.136
Total	36 (100)				

Of the 17 patients who presented vomiting, 10 (58.8%) were under the age of 18. Only patients older than 18 years received blood transfusions, presented infection or died. Nausea happened in the same proportion between patients older or under 18 years old.

The complication vomiting was associated in a statistically significant way with patients who underwent appendectomy (p = 0.00). The need for blood transfusion was associated in a statistically significant way with hospitalization time (p = 0.026) and to surgery time (p = 0.002). The presence of surgical site infection had statistically significant association with age (p = 0.009), hospitalization time (p = 0.001), and surgery time (p = 0.014).

As for the four cases of death after surgery, all analyzed patients were considered critical and, of these, two were older adults. It should be noted that no patient presented vomiting or nausea during or after surgery, and, in such cases, the average fasting time was 283.7 minutes.

DISCUSSION

In this study, we observed that, of the 181 cases investigated, only 19.9% presented postoperative complications and only 12.7% were related to the gastrointestinal tract, being vomiting the most frequent complication.

The evidenced results seem to demonstrate that the fasting time in the sample investigated did not have a prominent role concerning the presented complications, i.e., despite the reduced average fasting time, there was no statistically significant association between fasting and complications such as nausea and vomiting, and no cases of aspiration pneumonia were registered in the investigated records.

It is noteworthy that none of the hospitals included in the study implemented the recommendations of the projects ERAS and ACERTO regarding perioperative care.

Thus, the scientific literature has highlighted the security of altering the practice of fasting, suggesting even that patients with prolonged fasting can, on the day of surgery, present vomiting with content from the previous day's meal, stating that the vomiting is not necessarily associated with the decreased fasting time[19].

It is worth mentioning that, in this study, all cases of vomiting in the sample studied were not associated with the reduction of fasting time and the clinical picture that generated the hospitalization, i.e., vomit cases in the studied sample were associated in a statistically significant way with the diagnosis that led to surgery, especially appendicitis.

In addition, aspiration pneumonia has been considered a rare phenomenon. Although prevention is necessary, it has not been associated with the period of preoperative fasting in recent investigations[19-21].

The aspects mentioned above are reinforced by a recent study, which analyzed the total body water and the occurrence of vomiting among patients who underwent elective surgeries of stomach cancer, divided into two groups. The control group performed the traditional preparation (liquid consumption on the eve of the surgery, with fasting for 8 hours, coupled with the use of laxative or enema medications); and the study group was exposed to the ERAS protocol (food intake until dinner, and then, only clear liquids, suspended 2 hours prior to surgery and use of laxative medication). The authors found that the reduction of fasting time and the use of laxatives were able to keep more efficiently the total body water of patients. It should also be noted that no vomiting or aspiration of gastric contents occurred in the evaluated groups[22].

A prospective cohort study, comparing the results of abdominal surgery in the older patients before and after implementation of a multimodal protocol (ACERTO), which included the reduction of fasting, early reintroduction of the diet postoperatively, and decrease of intravenous fluids, noticed a four-day reduction in the hospitalization time among the analyzed patients, as well as decrease of surgical site infection rate from 19% to 2.7%[23].

In addition, research analyzing the deployment of ERAS among patients who underwent colorectal surgery concluded that the need for infusion of liquids and hospitalization time decreased[24].

Another study, of the case-control type, verified the impact of the implementation of a protocol for preoperative fasting time reduction between a group of adult patients who performed traditional fasting (control group = 29) and another group that ingested clear liquids until 2 hours before surgery (cases group = 24). The authors observed minor complaints of headache, nausea and thirst among those who were offered liquids, improving their comfort without increasing the risks[25].

It should be noted that the studies mentioned above show that the practice of fasting time reduction was not associated with complications such as nausea, vomiting or aspiration pneumonia. However, this practice seems to improve postoperative results of patients.

In this study, reduced fasting time in urgent and emergency and surgeries was not related to the complications found, which is consistent with the international scientific literature that which has been demonstrating safety in performing surgeries with smaller fasting times. This seems to provide clinical benefits in patients' recovery, in addition to comfort and satisfaction with the experience.

This study is a preliminary research that aims to contribute to the discussion of security related to the practice of reduction of fasting, from a reality already experienced by patients in real care situations. That way, even in situations characterized by unpredictability, such as occur in urgent and emergency surgeries, the reduction of fasting time does not seem to be the main contributing factor to the complications traditionally associated with reduced fasting time, such as nausea, vomiting and aspiration of gastric contents.

It is important to mention the limitations related to the generalization of the data, since the study adopted a retrospective data analysis approach, subject to the quality of the information available in the patients' records. In addition, in the investigated sample, the reduction of the fasting time was motivated by the clinical/surgical necessity and not within a controlled approach, aiming at better recovery.

We suggested, therefore, the conduction of new studies with controlled designs such as randomized clinical trial, to enable greater control of variables and with the participation of the entire multidisciplinary team.

Considering, moreover, patient safety and the prevention of complications by means of a perioperative nursing care based on scientific evidence should be the goal of nurses involved in surgical patients care[26]. Nurses should assume their role of leadership within the health team, seeking the best ways to assist the patient in obtaining the highest level of well-being, associated with more positive results for postoperative recovery.

CONCLUSION

We concluded that, among the 181 records examined, most patients were female, with an average age of 31 years, who underwent surgeries with average length of 59.4 minutes and average fasting time of 122.7 minutes.

They presented some kind of post-surgical complication, especially nausea and vomiting – only 36 cases (19.9%) – with average fasting time of 133.5 minutes. No case of aspiration pneumonia was registered.

The variable nausea, vomiting, surgical site infection, blood transfusion, and death were not associated in a statistically significant way with the average fasting time practiced, but to clinical situations that led patients to the need of hospitalization.

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