Analysis of blood pressure records at post-anesthesia recovery room

Análise dos registros da pressão arterial na sala de recuperação pós-anestésica

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Abstract

Objective: To analyze the blood pressure records and their accuracy in the score of the circulation item at the post-anesthesia recovery room.

Methods: Cross-sectional study of the postoperative records from 23 histories of patients admitted to the post-anesthesia recovery room after small and medium-sized surgeries. The Aldrete-Kroulik index was used. Statistical analysis was applied in numerical and percentage terms.

Results: Upon the patients' admission, 48% of the records for the circulation item were not accurate. At the patients' discharge, 39% were assessed imprecisely.

Conclusion: In some cases, the quality of the records and the accuracy of the Aldrete-Kroulik index score for the circulation item were not observed, compromising patient safety.

Resumo

Objetivo: Analisar os registros da pressão arterial e sua acurácia na pontuação do item circulação na sala de recuperação pós-anestésica.

Métodos: Estudo transversal que incluiu os registros pós-operatórios de 23 prontuários de pacientes admitidos na sala de recuperação pós-anestésica após cirurgias de pequeno e médio porte. Foi utilizado o índice de *Aldrete* e *Kroulik*. Foi realizada análise estatística numérica e percentual.

Resultados: Na admissão dos pacientes, 48% dos registros do item circulação não mostraram acurácia. Na avaliação da alta do paciente, 39% deles foram avaliados de forma imprecisa.

Conclusão: Em alguns casos, não foram observadas a qualidade do registro e a acurácia da pontuação do item circulação do índice de *Aldrete* e *Kroulik*, comprometendo a segurança do paciente.

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Introduction

The first 24 hours of the postoperative period, called immediate postoperative period, demand attention from the multiprofessional and nursing teams, which follow the patients from their entry in the post-anesthesia recovery room until their discharge from this unit.[1]

To guarantee patient safety in that period, the nurses need to perform some care actions until the vital signs and protective reflexes have been stabilized, guaranteeing the patients' comprehensive assessment, according to the surgical procedure, anesthetic agents and individual risks. They also need to heed any complications that may occur in the immediate postoperative period, such as respiratory, cardiovascular and renal complications, among others.[2]

In 1970, the Aldrete-Kroulik index was developed, submitted to a revision and update in 1995. This index is used to systemize the observation of the patients' physiological conditions and discharge from the post-anesthesia recovery room.[1]

The Aldrete-Kroulik index assesses the motor, respiratory, circulatory and neurologic activities, with a score ranging from zero to two points for each parameters, in which zero indicates the most severe condition, 1 the intermediary condition and 2 that the functions have already been established. According to the Aldrete-Kroulik index, the patient receives discharge from the post-anesthesia recovery room and is transferred to the unit of origin when reaching the total score between 8 and 10 points.[3] It should be highlighted that the index is one way to assess the patient, which does not discard the need for complementary assessments, like pain, temperature, nausea and vomiting for example, among others.[2,4]

This scenario entails insecurity regarding the patient's forwarding to the unit of destination. The blood pressure assessment may be compromised and the patient may be subject to complications or discomfort related to hypo or hypertension.

The difficulty in the application of the Aldrete-Kroulik index is mainly related to the assessment of the circulatory system, as the identification of the preoperative blood pressure is needed to obtain the score. Thus, the patient receives score 2 on the circulation item if the blood pressure varies within 20% of the pre-anesthesia level; 1 if the pressure varies between 20 and 49% of the pre-anesthesia value; and zero if the variation exceeds 50% of the pre-anesthesia value. The blood pressure needs to be calculated appropriately and compared with the preoperative levels.

It is fundamental for the nursing team to know this information, as the correct application of the Aldrete-Kroulik index grants safety to transfer the patient to the unit of destination. The mistaken completion of this assessment parameter can expose the patient to risk situations and lead to the worsening of his general status.[3]

This study aimed to analyze the blood pressure records and their accuracy in scoring the "circulation" item, according to the Aldrete-Kroulik index, at the post-anesthesia recovery room.

Methods

This cross-sectional study was undertaken at a hospital in the city of São Paulo, State of São Paulo, in the Southeast of Brazil, considering 23 histories of patients submitted to small and medium surgeries between May and July 2013. Patients over 12 years of age who spent more than 45 minutes at the recovery room were included.

The sample corresponded to 41% of the mean number of patients admitted to the post-anesthesia recovery room during that period. The mean number of surgeries at the service was 51 surgeries/month, and the mean number of admissions to the post-anesthesia recovery room 19 patients/month.

The data collection instrument was a questionnaire that verified the patients' demographic characteristics (sex, previous disease and age, surgical procedure data), surgical specialty, type of anesthesia, classification of anesthetic risk according to the American Society of Anesthesiologists (ASA) and perioperative problems.

Healthy patients without previous diseases are classified as ASA I; patients with mild systemic disease as ASA II; patients with severe systemic disease as ASA III; patients with intense systemic disease that represents a constant death risk as ASA IV; dying patients as ASA V; and brain-dead patients who are organ donors as ASA VI.[2]

As perceived, the nursing professional at the post-anesthesia recovery room has not properly assessed the parameters of the Aldrete-Kroulik index, mainly regarding the assessment of the circulation, which demands a numerical calculation that is rarely used.

The following data were collected from the "circulation" item of the Aldrete-Kroulik index: pre-operative blood pressure; blood pressure upon admission to and discharge from the post-anesthesia recovery room, percentage of variations between pre- and post-operative pressure levels and score registered in the patient file.

The data were analyzed to verify the accuracy of the score as well as the register of the Aldrete-Kroulik index. Hence, the percentage variation between the preoperative systolic and diastolic blood pressure was calculated upon admission and the postoperative systolic and diastolic blood pressure upon the patients' discharge from the post-anesthesia recovery room. After identifying these variables, the Aldrete-Kroulik index was again applied and the precision of the item scored was analyzed.

The results were analyzed and presented in tables, using numerical and percentage statistics.

The study development complied with the Brazilian and international ethical standards for research involving human beings.

Results

According to the demographic characteristics indicated in the 23 files selected for this study, 16 (70%) patients were female. As regards previous diseases, 14 (61%) patients presented a disease, most of which related to the cardiovascular sys-

tem, followed by endocrine diseases; 9 (39%) patients denied the existence of diseases. Four presented associated cardiovascular and endocrine diseases.

The patients' mean age was 41.7 years, with seven patients (31%) over 60 years of age, followed by the adult age range between 30 and 40 years (22%).

Concerning the surgical specialties, 12 (52%) were related to otorhinolaryngology, seven (31%) to general surgery, two (9%) to orthopedics, one (4%) to ophthalmology and one (4%) to dentistry. As regards the anesthetic procedure, 13 (57%) were submitted to balanced general anesthesia, seven (30%) to spinal and epidural anesthesia + sedation and three (13%) to block + sedation.

What the ASA estimate and risk are concerned, ten patients (43%) were classified as ASA I, five (22%) as ASA II and three (13%) as ASA III. In five patients' files (22%), two classifications were found.

In tables 1 and 2, the variations between the blood pressure records upon the patient's admission and discharge from the post-anesthesia recovery room are displayed.

In 4% of the files analyzed, no records were found of the blood pressure upon the patient's admission to the post-anesthesia recovery room.

Table 1. Variations in blood pressure and records upon admission

Blood pressure alteration (%)	n(%)	Correct records
>20	11(48)	11
20-49	8(35)	0
>50	3(13)	0
No records	1(4)	-
Total	23(100)	-

Table 2. Variations in blood pressure and records upon discharge

Blood pressure alteration (%)	n(%)	Correct records
>20	13(57)	13
20-49	8(35)	0
>50	1(4)	0
No records	1(4)	-
Total	23(100)	-

Discussion

The study was undertaken at a hospital that mostly performs outpatient surgeries, that is, the patient is admitted for the surgery and discharged the same day, after stabilizing from the surgery and anesthesia. The research limits are related to the cross-sectional design, which does not permit the establishment of cause and effect relations.

The study results showed that most (70%) of the patients admitted to the post-anesthesia recovery room were female. In a study of 260 histories of patients submitted to small surgeries, women were also predominant, corresponding to 54.5% of the study sample.[5] The predominance of the female sex may be related to the type of care delivered at the study hospital, but this fact did not interfere in the proposed results and objectives. Studies show that the female population tends to visit health services more frequently and are forwarded more frequently for small and medium surgeries than men, mainly elective surgeries, in which the patient seeks the service due to some specific problem.[5]

Another result found was the number of patients with previous diseases. In this study, cardiovascular diseases were predominant (61%), followed by endocrine diseases. Systemic arterial hypertension was the most prevalent previous disease. In Brazil, today, hypertension is considered one of the main health problems in the adult and elderly populations, raising healthcare costs and entailing risks for the accomplishment of surgical procedures.[6]

The instability of the cardiovascular system is frequent after surgeries. Therefore, the nursing team needs to heed possible complications in that period as, if the manifestations are not detected and treated early, the patient may evolve with a clinical problem, extending the length of recovery and increasing the chances of postoperative and anesthetic complications.

Systemic arterial hypertension at the post-anesthesia recovery room may be related to pain, bladder distension and neuromuscular agitation, among other reasons. In patients with a history of previous cardiac problems, attention is needed due to complication risks.[2] The nurses' careful assessment of vital signs and the patient during that period should be done and documented, guaranteeing patient safety.

Another common previous disease among those classified as endocrine in this study is diabetes mellitus, mainly type 2. The association between systemic arterial hypertension and diabetes mellitus is a frequent finding in preoperative assessments.[2,7]

The patients' mean age was 41.7 years. In this study, most patients (53%) were over 30 years of age and 31% over 60 years of age. In a study that aimed to classify the recovery room patients according to the degree of dependence, the patients' mean age was 51.57 years. In another study, which investigated the patients' mean complications at the post-anesthesia recovery room, found that most patients were over 30 years of age (75.67%).[8-10]

At many services, care at the post-anesthesia recovery room has been focused on young adult patients. In this study, we found the prevalence of elderly people, probably due to the increase of this age range in the Brazilian population, as well as the greater possibility of specialized healthcare and treatment resources, like surgeries of different dimensions for example. This profile arouses reflections about the need to reconsider the care and the dependence level, mainly in the immediate postoperative period.[11]

The surgical specialties found are related to the characteristics of the study hospital, which is an outpatient care hospital. That explains why small and medium surgeries have been performed, due to the care in specialty areas like otorhinolaryngology and ophthalmology.

The most identified anesthesia type was general balanced anesthesia (57%), in which the drugs are administered through the intravenous and inhalation route, followed by spinal and epidural anesthesia (30%) and blocks with sedation (13%). Other studies also found general anesthesia as the most frequent, like in a study involving 65 patients for example, which was

aimed at identifying the most prevalent nursing diagnoses at the post-anesthesia recovery room. General anesthesia was registered in 86.1% of the cases, followed by spinal and epidural anesthesia in 7.7%.[12] Lima et al. found that general anesthesia was the most prevalent in 76.1% of the anesthetic procedures performed.[9]

The use of general anesthesia comes with a specific patient profile with well-defined needs for the post-anesthesia recovery room. It is important for the nurses to recognize the most frequent type of anesthesia as, thus, they can know the changes related to the drugs involved in the different procedures faster and more easily. In general anesthesia, changes like a reduced level of awareness, delay to wake up, nausea, vomiting, agitation, hypothermia, among others, are common.

According to the ASA classification, most patients in this study is classified as ASA I, although there were ASA II and III patients as well. Studies include this classification as an important indicator of the patient's level of dependence on nursing care and the length of their stay at the post-anesthesia recovery room. In the analysis of the patients' level of dependence on nursing care at the post-anesthesia recovery room, a study found that, as the length of the patient's stay at the recovery room increases, the higher his dependence level on nursing care will be and the higher the ASA classification. This fact may indicate the need to adapt the available resources and to train the nurses.[9]

The ASA classification is an important indicator of the patient's level of severity and of the risk possibilities during the anesthesia-surgery procedure. Therefore, nurses should be familiar with this patient assessment support instrument, especially when considering that patients superior to ASA III should be submitted to anesthetic procedures at hospital services with hospitalization.

The results indicated accurate records (11 patients; 48%) upon the patient's admission, when the blood pressure differed by up to 20% from the preoperative level. When observing the cases of changes between 20 and 50% and superior to 50% of the blood pressure level, however,

we found records that did not correspond to the patient's actual situation.

In a study that identified the main nursing diagnoses at the recovery room, it was shown that the risk of disequilibrium in the fluid volume was found in 100% of the patients studied, that is, any patient at the post-anesthesia recovery room is at risk of circulatory instability, which may be related to a fluid deficit (hemorrhage), dehydration, ineffective volemic replacement, arrhythmias, besides hyper or hypotension associated with drug use, like the drugs used in spinal and epidural anesthesia for example.[12]

The incidence of acute pain should also be considered, responsible for blood pressure increases, especially in the systolic blood pressure. In a study about complications and nursing interventions at the post-anesthesia recovery room, pain appeared as a common complication (54% of the patients studied). The same study found arterial hypertension in 4.5% of the patients and hypotension in 3.2% of the cases, besides 6% of patients with hemorrhages.[2,12]

In another study, it was evidenced that about 64% of the patients submitted to anesthesia present episodes of systolic blood pressure <90mmHg and that more than 93% of them develop at least one episode of systolic blood pressure and mean blood pressure below 20% of the baseline value.[13]

The results for the patients' discharge are similar to the admission results. The records in the files of all patients are accurate when the blood pressure change corresponds to up to 20% (13 patients; 57%). In the other records, however, once again the professional's records were not exact (9 patients; 39%).

In addition, the absence of records for the "circulation" item was noteworthy in 4% of the histories for the patients in this study.

The assessment of the results found in this study was not intended to demonstrate the reasons for inaccurate Aldrete-Kroulik index registers. Therefore, further research is suggested to identify these reasons and consider educative measures directed at the professionals working at the post-anesthesia recovery room.

The Aldrete-Kroulik index records are used as a parameter for discharging the patients from the recovery room, but are not used in isolation. Other parameters like pain, nausea and vomiting, respiratory pattern, among others, are also considered. The register of the item "circulation" in particular involves calculations and, as perceived, accuracy difficulties were observed, which could be related to this calculation and, consequently, to its appropriate interpretation. Another factor to be considered is the characteristic of the post-anesthesia recovery unit, which is marked by high turnover, which can cause difficulties for records and their appropriateness to the patient's actual situation.[9]

This can compromise the quality of care delivery at the post-anesthesia recovery room, ranging from appropriate records to patient safety, due to the lack of records and the possibility of enhanced risks due to the discontinuity of the care.

Conclusion

In some cases, high-quality records and accurate scores of the "circulation" item in the Aldrete-Kroulik index were not observed, compromising the patient safety.

Collaborations

Cecílio AAS contributed to the project conception, analysis and interpretation of the data and writing of the article. Peniche ACG cooperated with the final approval of the version for publication a. Popov DCS cooperated with the project conception, writing of the article and relevant critical review of the intellectual content.

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