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REPORTS IN PUBLIC HEALTH

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Triggers for active surveillance of adverse drug events in newborns

Rastreadores para a busca ativa de eventos adversos a medicamentos em recém-nascidos

Rastreadores para la búsqueda activa de eventos adversos con medicamentos en recién nacidos

Sandra de Carvalho Fabretti [1]
Sandra Cristina Brassica [2]
Marco Antonio Cianciarullo [2]
Nicolina Silvana Romano-Lieber [1]

doi: 10.1590/0102-311X00069817

Abstract

The study aimed to verify the application and performance of triggers for adverse drug events in hospitalized newborns. This prospective cohort study was conducted in the neonatal care units of a university hospital from March to September 2015. A list of triggers was developed for the identification of adverse drug events in this population. The list included antidote, clinical, and laboratory triggers. A total of 125 newborns who had received drugs during the hospitalization were included. Neonatal patient charts were screened to detect triggers. When a trigger was found, the patient chart was reviewed to identify possible adverse drug events. Each trigger's yield in the identification of adverse drug events was calculated and then classified according to its performance. Nine hundred and twenty-five triggers identified 208 suspected adverse drug events. The triggers' overall yield was 22.5%. The most frequently identified triggers were: drop in oxygen saturation, increased frequency of bowel movements, medications stop, and vomiting. The triggers with the best performance in the identification of adverse drug events were: increased creatinine, increased urea, necrotizing enterocolitis, prescription of flumazenil, hypercalcemia, hyperkalemia, hypernatremia, and oversedation. The triggers identified in this study can be used to track adverse drug events in similar neonatal care services, focusing on the triggers with the best performance and the lowest workload in the identification.

Newborn Infant; Pharmacovigilance Drug-Related Side Effects and Adverse Reactions

Correspondence
S. C. Fabretti
Faculdade de Saúde Pública da Universidade de São Paulo
Av. Dr. Arnaldo 715, São Paulo, SP 01246-904, Brasil.
sandrafabretti@gmail.com

[1] Faculdade de Saúde Pública, Universidade de São Paulo, São Paulo, Brasil.
[2] Hospital Universitário, Universidade de São Paulo, São Paulo, Brasil.

Introduction

Newborns are considered vulnerable to adverse drug events due to their physiological immaturity, difficulty in determining their body proportions for drug dosage, practical limitations to drug administration, inability to communicate with the attending health team to alert them to symptoms, and the high numbers of drugs used for their treatment when hospitalized [1,2,3,4]. Additional factors include the limited participation by this patient population in clinical trials for registration of new drugs, leading to extrapolations based on the results of studies conducted in older children and adults [5].

Thus, the surveillance of possible adverse drug events at all levels of care, including hospitals, is important to assess the risk/benefit of the medications use, especially in more vulnerable populations [6,7].

A strategy known as triggers has been proven to be a superior tool (compared to the conventional system of voluntary reporting) for investigating adverse events in hospitalized patients [8]. A trigger can be found by reviewing the patient's chart, and its presence allows focusing the investigation to determine the occurrence and measurement of adverse drug events [9,10].

Although studies have been performed on the use of triggers to identify adverse drug events in the pediatric population, thus far there has been no research on triggers for the identification of adverse drug events exclusively in hospitalized newborns.

Sharek et al. [11] used triggers for adverse events in a neonatal intensive care unit, but their triggers were focused more on the identification of events related to care by the health team. In addition, they did not specify whether all the patients in the unit belonged to the neonatal age group.

This study thus aimed to propose triggers and verify their application and performance for active surveillance of adverse drug events in hospitalized newborns from 0 to 29 days of age.

Methods

We performed a cohort study applying a patient chart review technique that used a list of triggers for the identification of adverse drug events. The work was conducted at a university hospital in the city of São Paulo, Brazil. This is a teaching hospital devoted to medium-complexity medicine and with 178 beds. The study took place in the Neonatal Intensive Care Unit (neonatal ICU) and the Intermediate Neonatal Care Unit (INCU). The research project was approved by the Institutional Review Board at São Paulo University (case review 835.506/2014).

The list of triggers was determined jointly by the Medical and Clinical Pharmacy Neonatal Teams in neonatology. To develop the triggers' list, we analyzed the standard drugs at the institution, selecting those most frequently prescribed and with the most serious and/or most frequent adverse drug events related. Other triggers used by Takata et al. [8], Sharek et al. [11], Matlow et al. [12], and Silva et al. [13] were included in the list. The team also recommended additional triggers based on the hospital's profile of care.

For purposes of this study, adverse drug event was defined as "*any unfavorable clinical occurrence during drug treatment but which does not necessarily bear a causal relationship to the drug*" [14].

A pilot study was performed from December 9, 2014, to January 30, 2015, at the hospital's neonatal ICU with the aim of testing the list of triggers and data collection tools. A total of 18 patients were followed in the pilot study. Adverse drug events triggers were searched in the hospitalized newborns' charts, medical prescriptions, and laboratory test results. At the conclusion of the pilot study, the data collection tools and list of triggers were revised and adjusted. The process resulted in a final list of 48 triggers (Table 1), classified as follows: (1) 7 antidote triggers: substances used to antagonize the toxic or exarcerbated effects of a medicinal product [15]; (2) 18 clinical triggers: sentinel words that can identify adverse drug events in annotations by health professionals on the patient's chart 1 [3]; (3) 23 laboratory triggers: altered results of laboratory tests leading to suspicion of the occurrence of an adverse drug events [16].

The sample size was set at 125 newborns, calculated by using the total number of hospitalized newborns in the hospital's neonatal ICU and INCU in the year 2013. The study considered an expected incidence of 10% of adverse drug events in a population of 1,244 newborns, with 95% confidence interval (95%CI) and 5% margin of error.

Table 1

List of triggers with comments and principal suspected adverse drug events that can be identified in patients admitted to Neonatal Intensive Care Unit (neonatal ICU) or Intermediate Neonatal Care Unit (INCU).

Triggers	Principal suspected adverse drug events	Observations
Antidotes		
Prescription of methylene blue	Methemoglobinemia due to inhaled nitric oxide, use of local anesthetics lidocaine and benzocaine	
Prescription of antihistamine	Hypersensitivity	
Prescription of flumazenil	Over-sedation from benzodiazepines	
Prescription of levothyroxine after use of: dopamine/dobutamine / amiodarone/phenytoin	Drug-induced hypothyroidism	
Prescription of methadone/lorazepam	Treatment of withdrawal syndrome from opioids and/or hypnotic-sedative drugs	
Prescription of naloxone	Over-sedation, thoracic rigidity due to opioid products	
Prescription of neostigmine	Residual blockade/respiratory arrest following use of neuromuscular junction blockers	
Clinical		
Increased frequency of bowel movements	Diarrhea, intolerance to medications	Consider newborn's habitual frequency of bowel movements and then determine increase in frequency and occurrence of suspected adverse drug events. Requires daily recordings of number of newborn's bowel movements.
Necrotizing enterocolitis	Following use of non-steroidal anti-inflamamatory drug; caffeine; ranitidine	
Erythema/Urticaria/ Papule/ Rash	Hypersensitivity reactions	Consider these words as trigger when recorded in the clinical assessments on patient record and not related to diaper rash or neonatal toxic erythema, a benign self-limited condition [27].
Mechanical stimulation to pass stools /Use of glycerin suppository	Intestinal constipation	Especially used to detect intestinal constipation after use of known constipating drugs like opioid products. The list of triggers for older children recommends prescription of laxatives or use of stool softeners [8], which are not prescribed for newborns.
Rise in arterial pressure	Arterial hypertension	Consider rise in systolic and/or diastolic arterial pressure above the 95th percentile for gestational age, birth weight, and corrected age. Also consider when the expressions "elevated blood pressure" or "increased blood pressure" are recorded on patient chart.

(continues)

Table 1 (continued)

Triggers	Principal suspected adverse drug events	Observations
Clinical		
Hypotension	Drop in arterial pressure; hypersensitivity reactions; over-sedation	After 48 hours of life, consider when mean arterial pressure ≤ 30mmHg. Also consider when the expressions "hypotensive" and "drop in blood pressure" are recorded on patient chart.
Unplanned intubation	Over-sedation, hypersensitivity reactions	Can also be identified with the expressions: "intubation" or "OTI performed" (orotracheal intubation).
Cardiorespiratory arrest/ Cardioversion	Over-sedation, hypersensitivity reactions	
Pneumonia	Associated with previous use of ranitidine	Ranitidine-induced hypochloridria can alter intestinal microbiota, contributing to increased susceptibility to infections.
Hearing impairment	Due to use of ototoxic drugs	For example, gentamicin, amikacin, and loop diuretics.
Prescription of phenobarbital	Seizures induced by drugs acting on the central nervous system or that alter the fluid-electrolyte balance	
Blood in feces/"Dark brown" vomit	Gastrointestinal bleeding, hemorrhage	Consider starting at 72 hours after birth, since the newborn may have swallowed maternal blood during birth.
Drop in oxygen saturation	Due to use of anticonvulsants, hypnotics, sedatives, surfactant	
Vomiting	Vomiting, intolerance to medications	Use instead of the trigger "prescription of antiemetics", which is on the list of pediatric triggers applied to older children to identify nausea and vomiting 8, since antiemetics are not used in newborns.
Oversedation	Due to hypnotics-sedatives, opioid products	
Medications stop	May point to the drug suspected of causing the adverse event	Also consider when the word "suspend" is next to a previously prescribed drug. Not considered as a trigger when referring to termination of treatment or dose adjustment.
Tachycardia	Due to use of adrenergic agonists, caffeine	
Transferred to a unit with more intensive care	May indicate that a serious adverse occurred, requiring patient's transferal to a unit with more intensive therapy to provide adequate support for treatment of this adverse drug events.	
Laboratory		
Anemia	hemorrhage, use ofnon-steroidal anti-inflammatory drug	
Increase in serum creatinine	Worsening of renal function due to nephrotoxic drugs vancomycin, aminoglycosides, loop diuretics	Consider trigger if not dehydration in the patient. Consider increase in serum creatinine > 0.2-0.3mg/dL/day or > 1.0mg/dL. Also consider if this expression is recorded on patient chart.
Increase in serum urea	Worsening of renal function due to nephrotoxic drugs vancomycin, aminoglycosides, loop diuretics	Consider trigger when not patient dehydration. Consider values > 25mg/dL. Also consider if this expression is recorded on patient chart

(continues)

Table 1 (continued)

Triggers	Principal suspected adverse drug events	Observations
Laboratory		
Increase in hepatic enzymes AST/ALT	Worsening of hepatic function due to use of hepatotoxic drugs	
Eosinophilia	Hypersensitivity reactions	
Hypercalcemia; hypocalcemia; hypernatremia; hyponatremia; hyperphosphatemia; hypophosphatemia; hyperkalemia; hypokalemia; hypermagnesemia; hypomagnesemia	Fluid-electrolyte imbalance common to various drugs	
Hyperglycemia; hypoglycemia	Drugs that alter carbohydrate metabolism and/or insulin secretion	Hyperglycemia: consider trigger when blood glucose > 125mg/dL and/or when "hyperglycemia" recorded on patient chart. Hypoglycemia: Consider more than 72 hours after birth, since newborns have a lower hepatic glucose reserve and high risk of development of hypoglycemia soon after birth. Consider trigger when blood glucose < 40mg/dL and/or when "hypoglycemia" recorded on patient chart.
Leukocytosis; leukopenia; neutrophilia; neutropenia; thrombocytosis; thrombocytopenia	Drug-induced hematologic or bone marrow alterations	

The sample was drawn from all admissions of newborns to the INCU and neonatal ICU. Data were collected from March to September 2015, and patient charts were reviewed at least 3 times a week.

The study included all newborns admitted to the neonatal ICU and INCU that received at least one drug.

The hospitalized newborns were included in the sample when they met the eligibility criteria. These newborns were followed up to discharge or the 29th day of life, since a newborn is defined as every individual from 0 to 28 days of life [17].

The study excluded hospitalized newborns that only used the following drugs: diaper rash creams, antiseptics for the umbilical stump and/or topical use, physiological saline solution (0.9% sodium chloride) for inhaled use and/or nasal cleansing, BCG and hepatitis B vaccines, and oral and/or injectable vitamin K. Vitamin K is administered to every Brazilian newborn soon after birth and up to 7 days of life for prophylaxis of hemorrhagic disease of the newborn [18]. According to the Ministry of Health's vaccination schedule, soon after birth every newborn receives a single dose of BCG vaccine for tuberculosis prophylaxis and the first dose of hepatitis B vaccine [19]. The study did not consider adverse drug events that occurred in the newborn due to medication taken by the mother.

The study variables collected from annotations on the newborns' patient charts were: unit where the newborn was admitted: INCU and/or neonatal ICU; classification of the newborn: term versus preterm; gender: female or male; diagnostic hypothesis at admission; number of triggers identified in the patient records; number of triggers identified that detected adverse drug events; number of adverse drug events identified; and the drugs related to the adverse drug events that were identified.

In order to monitor the hospitalized newborns, each patient's records were reviewed in the following order: patient charts, medical prescriptions, and results of laboratory tests. When a trigger was

identified, it was recorded on the data collection tools and a search was made for possible adverse drug events that could be signaled by the trigger. When an adverse drug events was identified, it was analyzed according to the patient's clinical conditions, timing between the drug's administration and appearance of the event, and data from the literature. Although the medical team recorded the patient's clinical evolution three times per day while the newborn was in the unit, if the same trigger was identified all three times, it was only tabulated once.

Adverse drug events are already monitored routinely by the attending team, since the institution is part of the Sentinel Hospitals Program of the Brazilian Health Regulatory Agency (Anvisa) [20], seeking to validate an instrument to facilitate the active surveillance of these events. Thus, suspected serious adverse drug events during the study were reported to the Pharmacosurveillance Department.

At the end of data collection, the events that had been identified were reassessed to verify whether they might be associated with the respective drugs, according to the pharmacological profile, the patient's clinical conditions, and timing between administration of the drugs and the events. Included in this reassessment were the pharmacist in charge of the data collection and identification, the neonatal clinical pharmacist, and the hospital's risk management pharmacist, besides two physicians from the neonatology team.

The triggers' performance was calculated using the yield model proposed by Giordani et al. [16] and Rozenfeld et al. [21], with three components. The first component was calculated by dividing the number of times the trigger was identified by the total number of patients assessed, times 100 (1); the second, dividing the number of suspected adverse drug events identified by the trigger by the total number of patients assessed, times 100 (2); the third was calculated by dividing (2) by (1), times 100.

The component 1 expresses the workload needed to identify adverse drug events, since the more patients with triggers in their records, the greater the workload for identification of adverse drug events. The component 2 expresses the trigger's capacity to identify adverse drug events. The third component expresses the triggers' yield, i.e., each trigger's relative potential, compared to the others, to identify adverse drug events.

The triggers' performance was obtained as the weighted mean yield, calculated as the ratio between the total number of triggers found and the total number of patients assessed, times 100, and the total number of adverse drug events identified by the triggers found divided by the total number of patients assessed, times 100. Thus, triggers were grouped in performance categories based on mean yield: high-performance triggers, with 100% yield; medium-performance, with yield between the mean value and 99.9%; and low-performance, with yield below the mean.

We calculated the mean and standard deviation for the triggers and the adverse drug events identified, stratified by neonatal care unit and classification at birth.

Results

A total of 922 triggers were found, which were positive 208 times for the identification of suspected adverse drug events, corresponding to the final number of 115 confirmed adverse drug events. The number of times the trigger was positive is important for calculating the trigger's performance 11. However, for the final number of adverse drug events, each event was only considered once, since the same event could be identified by more than one trigger.

The total population (125 patients) showed a mean of 7.4 triggers (standard deviation – SD ± 8.5) and median of 5 (Q1 = 2.0 and Q3 = 10.0). There was a mean of 0.9 adverse drug events per patient (SD ± 1.3) and median 0.0 (Q1 = 0.0 and Q3 = 1.0). The number of triggers found per patient varied from 0 to 51. The number of adverse drug events identified by the triggers varied from 0 to 7, and the extreme values of 51 triggers and 7 adverse drug events were seen in the same newborn.

Triggers' mean yield was 22.6%. Nine triggers showed high performance. Table 2 shows the yield and performance categorization for each of the triggers used in the identification of suspected adverse drug events.

Fourteen triggers failed to identify any adverse drug events: unplanned intubation; cardiorespiratory arrest/cardioversion; prescription of phenobarbital; transfer to more intensive care unit; anemia;

Table 2

Classification, yield, and categorization of triggers' performance for search and identification of adverse drug events in newborns admitted to the Neonatal Intensive Care Unit (neontal ICU) and Intermediate Neonatal Care Unit (INCU).

Triggers	Classification of trigger	Triggers per 100 patients * (1)	Adverse drug events per 100 patients * (2)	Relative yield of trigger (3) = (2)/(1) x 100
High				
Increased creatinine	Laboratory	0.8	0.8	100.0
Increased urea	Laboratory	1.6	1.6	100.0
Necrotizing enterocolitis	Clinical	1.6	1.6	100.0
Flumazenil	Antidote	2.4	2.4	100.0
Hypercalcemia	Laboratory	0.8	0.8	100.0
Hyperkalemia	Laboratory	1.6	1.6	100.0
Hypernatremia	Laboratorial	2.4	2.4	100.0
Oversedation	Clinical	1.6	1.6	100.0
Naloxone	Antidote	4.0	4.0	100.0
Intermediate				
Increased arterial pressure	Clinical	3.2	2.4	75.0
Hyperglycemia	Laboratory	13.6	8.8	64.7
Vomiting	Clinical	80.8	45.6	56.4
Mechanical stimulation to pass stool/ Glycerin suppository	Clinical	8.0	4.0	50.0
Hyponatremia	Laboratory	1.6	0.8	50.0
Increase in bowel movements	Clinical	160.0	56.8	35.5
Blood in feces	Clinical	4.8	1.6	33.3
Hypokalemia	Laboratorial	3.2	0.8	25.0
"Dark brown" vomit	Clinical	6.4	1.6	25.0
Low				
Tachycardia	Clinical	11.2	2.4	21.4
Erythema/Urticaria/Papule/Rash	Clinical	16.0	3.2	20.0
Medication stop	Clinical	94.4	10.4	11.0
Drop in oxygen saturation	Clinical	211.2	6.4	3.0

* Number of patients = 125

hypocalcemia; hypophosphatemia; hypoglycemia; hypomagnesemia; hypotension; leukocytosis; leukopenia; neutrophilia; thrombocytopenia.

The most frequently identified triggers were: drop in oxygen saturation (211.2/100 patients); increase in bowel movements (160/100 patients); medication stop (94.4/100 patients), and vomiting (80.8/100 patients). Increased frequency of bowel movements and vomiting were also the triggers that identified two of the most frequent adverse drug events in the study, namely diarrhea (29.6%) and vomiting (23.5%). The following triggers were not identified in the patient charts: prescription of methylene blue; prescription of levothyroxine; antihistamine prescription; prescription of neostigmine; hearing impairment; pneumonia; increase in liver enzymes; hypermagnesemia; hyperphosphatemia, and eosinophilia.

Discussion

The triggers' yield can be influenced by the number of triggers included in the study and the way the multiple occurrences of the same trigger are recorded [22].

The triggers most identified in the study – those whose component 1 varied from 80.8 to 211.2/100 patients – reflect greater ease of detection in the patient charts. However, they also involve a higher workload in their analysis, since they may also be related to frequent symptoms in the study population and that may not reflect adverse drug events.

The triggers that were identified less frequently (from 0.8 to 1.6 triggers/100 patients) also require a greater workload to be found in patient charts, since they are rarer triggers. However, they may identify more serious adverse drug events, such as cardiorespiratory arrest or transfer to a more intensive care unit. The latter trigger can be useful for detecting serious adverse drug events that may have occurred in hospitalized newborns in the INCU that were later transferred to the neonatal ICU. This trigger was also used by Unbeck et al. [22], with a 20.6% yield, in an overall of 22.9%, in 600 patients from 0 to 18 years of age, including newborns. The current study did not detect any adverse drug events related to this trigger, perhaps because it identifies very severe and rare events, since patients in the INCU are not critically ill. It is possible that with a larger sample or one with more severe patients, this trigger would detect these adverse drug events.

As for performance (component 3), the triggers categorized as high-performance were not necessarily the ones most frequently recorded on patient charts. However, when they were found, they showed that an adverse drug events had occurred. Such triggers featured oversedation, prescription of flumazenil, prescription of methadone/lorazepam, and prescription of naloxone.

Even some triggers with intermediate performance are important in clinical practice. Vomiting is one example. This trigger was used to replace prescription of antiemetics as a trigger, which is part of the list of pediatric triggers, applied to older children to identify nausea and vomiting [8]. In the case of newborns, nausea is hard for the neonatology team to detect, in addition to the fact that the patient cannot explain the feeling. Besides, antiemetics are not used in this age group. Although vomiting as a symptom that is common to various underlying conditions, such as sepsis, which can be confused with the adverse drug events, it is an important trigger for the detection of this type of gastrointestinal disorder that can be caused by many drugs.

Increased frequency of bowel movements also shows intermediate performance but is an important trigger for detecting diarrhea. Diarrhea can be caused by various drugs, especially antimicrobials, due to their capacity to alter the intestinal flora [23,24]. The list of triggers for adverse drug events in older children and adults [8,9,10] includes the prescription of antidiarrheals, a drug class not used in newborns. Although diarrhea is usually not a serious event, it can lead to dehydration, failure to gain weight, or weight loss. However, this trigger entails a high workload, since newborns have an exacerbated gastrocolic reflex [18], making the newborn pass a stool soon after feeding. Therefore, to suspect that an adverse drug reaction occurred, one should consider the newborn's habitual frequency of bowel movements in order to then determine an increase in frequency and occurrence of suspected adverse drug events.

Suspension of a medication and drop in oxygen saturation are examples of low-performance triggers. Medication stop can be a useful trigger for assessing the association with use of the suspected drug, despite the low yield, since abrupt interruption of a drug can serve as a warning of the possible occurrence of an adverse drug event [8,13,25]. Meanwhile, drop in oxygen saturation was identified numerous times on the patient charts, since it is part of the neonatology team's routine workup. Since it is a frequent sign in newborns with illnesses related to the respiratory system and the inherent immaturity of premature neonates, this trigger did not prove adequate for investigating adverse drug events in the study population, since it require a high workload for the analysis and a low yield for identifying adverse drug events.

As for triggers that were not identified even once in the patient charts, hearing impairment is an example. This trigger was not adequate for detecting adverse drug events, because in this specific hospital, newborns' hearing is assessed by the speech therapy team. However, the assessment of the causal relationship between use of ototoxic drugs and hearing impairment is only done by that team after the patient's discharge, during outpatient follow-up. In this assessment, hearing tests are repeated for

confirmation of the event, and from there the patient is referred for more in-depth diagnostic workup and initiation of treatment with otorhinolaryngology. During neonatal care, the team only records the patient's use of the ototoxic drug.

Further, the presence of triggers on the patient chart requires careful interpretation and assessment of each case. For example, newborns, and especially premature neonates, can present a physiological increase in arterial pressure, characteristic of their development [23,24], which requires care when interpreting increased arterial pressure as a trigger.

Likewise, recording medication stop as a trigger requires asking the attending team about the reason for the suspension, since it can occur due to termination of the treatment or dose adjustment. This likely explains why the trigger was considered false-positive several times in the current study.

The same care should be taken when assessing the presence of triggers indicating gastrointestinal bleeding, like bloody stools or dark brown vomit. Newborns may present these two signs when they swallow maternal blood during birth and up to three days afterwards, or from fissures in the mother's nipples during breastfeeding. Confirmation of the source of blood in the feces or vomit requires performing the Apt-Downey test, which differentiates between fetal and adult hemoglobin [26]. Since it was not possible during the study to confirm whether this test had been performed, or whether the mother had cracked nipples, caution is advised when interpreting events detected by these triggers.

Details on the events identified by this study and the drugs involved will be the object of future publications.

Limitations

It can be difficult to detect altered laboratory tests in newborns, especially in premature neonates, who are further subdivided by weight and gestational age. Their biochemical parameters may also be altered physiologically by the inherent immaturity in this age group. Importantly, consensus meetings with the attending team can minimize these difficulties but not eliminate them entirely, since based on the aforementioned reasons it is difficult to determine whether the change in some laboratory parameters resulted from an adverse drug events or some other cause.

The quality of information on the patient charts is a limiting factor for identifying triggers and suspected Aadverse drug events [11,21]. During the patient chart review, some information was incomplete because the annotations had not been updated.

Another limitation was having to search for the rest of information in patients who had been discharged before the patient chart review occurred. In such cases, it was necessary to request the patient chart from the hospital medical archives and statistics department.

The lack of a gold standard method for identification of adverse drug events in hospitalized newborns is also an important limitation for comparison of results, besides hindering the assessment of suspected cases, an issue that has been observed by other authors [8,11,12,13,21].

Conclusions

The triggers listed on the basis of this study can be used for the active surveillance of adverse drug events in health care institutions with a similar profile, focusing on those with the best performance and lowest workload for identification.

Contributors

S. C. Fabretti, S. C. Brassica and N. S. Romano-Lieber participated in the study's conception, data analysis and interpretation, writing of the article, and approval of the final version. M. A. Cianciarullo participated in the data analysis and interpretation, writing of the article, and approval of the final version.

Acknowledgments

The authors wish to thank Prof. Dr. Eliane Ribeiro, Dr. Giselle Okada, and Dr. Silvia Ibidi for supporting and contributing to this study in the University Hospital, as well as the Brazilian National Research Council for the Master's scholarship.

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Resumo

O objetivo foi verificar a aplicação e o desempenho dos rastreadores para a busca ativa de eventos adversos a medicamentos em recém-nascidos hospitalizados. Trata-se de um estudo de coorte prospectivo. A pesquisa foi realizada em um hospital universitário, nas unidades de cuidado neonatal, durante o período de março a setembro de 2015. Uma lista de rastreadores foi desenvolvida para ser utilizada na identificação de eventos adversos a medicamentos nessa população. A lista contemplou rastreadores antídotos, clínicos e laboratoriais. Foram incluídos 125 recém-nascidos que utilizaram medicamentos durante a internação. Os prontuários dos recém-nascidos eram avaliados, a fim de detectar a existência de um rastreador. Se o rastreador fosse encontrado, seguia-se com uma revisão à procura de possíveis eventos adversos a medicamentos ocorridos. O rendimento de cada um dos rastreadores para identificar eventos adversos a medicamentos foi calculado e depois categorizado de acordo com o desempenho. Novecentos e vinte e cinco rastreadores identificaram 208 suspeitas de eventos adversos a medicamentos. A taxa de rendimento geral dos rastreadores foi de 22,5%. Os rastreadores mais identificados nos prontuários foram: queda da saturação de oxigênio, aumento da frequência de evacuação, suspensão de medicamento e vômito. Os rastreadores de alto desempenho na identificação de eventos adversos a medicamentos foram: aumento da creatinina, aumento da ureia, enterocolite necrosante, prescrição de flumazenil, hipercalcemia, hipercalemia, hipernatremia, hipersedação. Os rastreadores elencados com base neste estudo podem ser utilizados para a busca de eventos adversos a medicamentos em instituições de saúde de perfil semelhante, devendo ser considerados aqueles que obtiveram melhor desempenho e menor carga de trabalho para serem identificados.

Recém-Nascido; Farmacovigilância; Efeitos Colaterais e Reações Adversas Relacionados a Medicamentos

Resumen

El objetivo fue verificar la aplicación y el desempeño de los rastreadores para la búsqueda activa de eventos adversos con medicamentos en recién nacidos hospitalizados. Se trata de un estudio de cohorte prospectivo. La investigación se realizó en un hospital universitario, dentro de las unidades de cuidado neonatal, durante el período de marzo a septiembre de 2015. Se desarrolló una lista de rastreadores para que fuera utilizada en la identificación de eventos adversos con medicamentos en esa población. La lista contempló rastreadores antídotos, clínicos y de laboratorio. Se incluyeron a 125 recién nacidos a quienes se les administró medicamentos durante el internamiento. Los registros médicos de los recién nacidos se evaluaron, con el fin de detectar la existencia de un rastreador. Si se encontraba el rastreador, se continuaba con una revisión, en búsqueda de posibles eventos adversos con medicamentos acaecidos. El rendimiento de cada uno de los rastreadores para identificar eventos adversos con medicamentos fue calculado, y después categorizado, de acuerdo con el desempeño. Novecientos veinticinco rastreadores identificaron 208 eventos adversos con medicamentos sospechosos. La tasa de rendimiento general de los rastreadores fue de un 22,5%. Los rastreadores más identificados en los registros médicos fueron: caída de la saturación de oxígeno, aumento de la frecuencia de evacuación, suspensión de medicamentos y vómito. Los rastreadores de alto desempeño en la identificación de eventos adversos con medicamentos fueron: aumento de la creatinina, aumento de la urea, enterocolitis necrotizante, prescripción de flumazenil, hipercalcemia, hipercalemia, hipernatremia, hipersedación. Los rastreadores expuestos en base a este estudio se pueden utilizar para la búsqueda de eventos adversos con medicamentos en instituciones de salud con un perfil semejante, debiendo ser considerados aquellos que obtuvieron un mejor desempeño y menor carga de trabajo para ser identificados.

Recién Nacido; Farmacovigilancia; Efectos Colaterales y Reacciones Adversas Relacionados com Medicamentos

Submitted on 25/Apr/2017
Approved on 18/Jan/2018
Final version resubmitted on 08/Feb/2018