

CLINICAL INFORMATION

Inadvertent epidural ampicillin administration during labor: case report



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KEYWORDS

Inadvertent epidural administration;
Epidural;
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Abstract

Background: Inadvertent epidural drug administration is associated with morbidity and mortality. Several drugs have been administered accidentally through the epidural catheter and most of our knowledge is based on case reports.

Case report: A 33 year-old woman presented for delivery. Placement of epidural catheter was requested for labor analgesia and priming dose was administered. Five minutes later, ampicillin 1 g was given through the catheter inadvertently without hemodynamic or neurological changes. Ropivacaine administration was repeated, always with symptomatic relief until delivery. At hospital discharge, she remained without neurological or hemodynamic alterations.

Conclusions: The majority of errors are due to syringe and drug exchanges and inadvertent route administration. Erroneous administration into the epidural space can have immediate and late effects and there is no definitive and effective treatment. There are several preventive measures to reduce the potential complications; some opt for watchful waiting, others opt for administering other drugs as a dilution attempted.

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PALAVRAS-CHAVE

Administração peridural inadvertida;
Peridural;
Trabalho de parto;
Ampicilina

Administração peridural inadvertida de ampicilina durante trabalho de parto: relato de caso

Resumo

Justificativa: A administração inadvertida peridural de drogas está associada a morbidade e mortalidade. Várias drogas foram administradas acidentalmente pelo cateter peridural e a maior parte do que sabemos se baseia em relatos de caso.

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Relato de caso: Uma gestante de 33 anos chegou em trabalho de parto. Foi solicitada colocação de cateter peridural para analgesia de parto e a dose inicial foi administrada. Cinco minutos depois, 1 g de ampicilina foi administrado através do cateter inadvertidamente, sem alterações hemodinâmicas ou neurológicas. A administração de ropivacaína foi repetida, sempre com alívio dos sintomas até o parto. Na alta hospitalar, a paciente continuava sem alterações neurológicas ou hemodinâmicas.

Conclusões: A maioria dos erros são por troca de seringa ou drogas ou administração de rota inadvertida. A administração errônea no espaço peridural pode apresentar efeitos imediatos e tardios e não há tratamento definitivo ou efetivo. Existem várias medidas preventivas para reduzir complicações potenciais; alguns escolhem observação cuidadosa, outros, a administração de outras drogas para tentar a diluição.

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Introduction

Inadvertent epidural administration of drugs not approved for this pathway is associated with a risk of morbidity and mortality.¹⁻³ Complications are mainly neurological, such as paraplegia, sensory alterations and urinary incontinence.^{3,4}

The incidence of this error is underestimated.^{3,4} Several drugs have been accidentally administered through epidural catheter and most of our knowledge is based on case reports.^{1,3,5} Cases of inadvertent administration of cefazolin, piperacillin/tazobactam and gentamicin have been reported, the latter associated with low back pain.^{1,3,5} After the literature review, no case of inadvertent ampicillin administration by this route was found. The communication of these errors and their clinical repercussions are important for professionals who are faced with such situations in their medical practice, bjan since there are no guidelines on how to act in this situation.³

This paper reports a case of an inadvertent ampicillin administration by epidural catheter during labor.

Case report

A 33 year-old pregnant woman presented for delivery with no relevant personal history, IG/OP and 39 weeks of gestation.

At admission, the patient presented with Blood Pressure (BP) of 154/94 mmHg and a normal Heart Rate (HR). With labor evolution and spontaneous membranes rupture, it was requested the placement of an epidural catheter for analgesia. The technique was performed without complications with the placement of the catheter in the L4-L5 space and 20 mg of 2% ropivacaine and 10 mcg of sufentanil were given in a total of 12 mL of solution. Five minutes later, 1 g of ampicillin (10 mL) was given inadvertently by epidural catheter.

The anesthesiologist was immediately informed, the patient notified and the warning signs were explained. There were no significant alterations in BP or HR. Neurological examination revealed no alterations.

Until childbirth, the parturient neurological status, HR, BP and temperature and fetal HR were monitored. The

administration of 20 mg of 2% ropivacaine was repeated, when the parturient requested it, in a total of three administrations until delivery, always with pain relief. Eutocic delivery occurred eight hours later, without complications.

An examination was performed 24 and 48 hours after the error occurrence, and no alteration was found in neurological status or hemodynamic parameters.

At hospital discharge, the patient was informed of the alarm signs that should motivate a re-evaluation in the emergency department. One year later, the patient continues without any associated complication.

Discussion

Ampicillin is an antibiotic used as prophylaxis in labor and is administered intravenously. In the above-mentioned case, the error occurred due to ampicillin administration by the epidural catheter.

In our hospital, the anesthesiologist places the epidural catheter for labor analgesia and performs the first administration of ropivacaine and sufentanil. Nurses with appropriate training are then responsible for subsequent administrations.

The vast majority of errors administration is due to syringe exchanges, drug ampoule errors, and inadvertent epidural/intravenous administration.¹⁻³

Wrong drug administration into the epidural space can have immediate and late effects.^{1,2} Immediate occurrence of neurological symptoms following administration usually occurs with drugs containing neurotoxic additives or due to pH or osmolarity effects.^{1,2,5} Also, the number of administrations, total dose and concentration administered also plays an important role in the incidence of adverse effects.¹

However, after inadvertent administration of a drug, there is no definitive or effective treatment, only several indications based on other clinical cases to reduce the potential complications.^{1,3-5} Some opt for watchful waiting, with patient observation and, if necessary, symptomatic or supportive treatment.⁴ Others recommended the administration of an antidote via the intravenous route like naloxone for opioids.³ In an attempt to decrease the volume and/or concentration of the drug administered erroneously, in some

cases, the options were aspiration through the epidural catheter, administration of saline solution or other drugs, and the placement of a second catheter to perform epidural space washes.^{1,3-5}

Concentration diluting is expected to reduce chemical irritation or nerve tissue injury, a decision that turns out to be merely speculative.^{1,5} In addition to dilution attempted, administration of local anesthetic is used for symptomatic relief, while the administration of corticosteroids used to reduce inflammatory response.^{3,4}

After a brief review of the literature, the option taken in this case was ropivacaine administration due to the need to extend analgesia until childbirth and the ampicillin concentration dilution in the epidural space. However, repeated administration of the anesthetic could confuse the diagnosis of a potential neurological injury, which we could verify that did not occur when the effects of ropivacaine disappeared.

Immediate explanation to the patient is extremely important either for anxiety relief and to lessen the possibility of subsequent medical-legal consequences.³ The possible adverse effects should also be discussed for a better appreciation of warning signs.

After this case, we speculated about what might have happened in the epidural space taking into account the chemical properties of the drugs used. According to the pH of the drug, ampicillin pH ranges from 8–10, ropivacaine, 4–6 and sufentanil, 3.5–5; we can consider that ampicillin may have alkalized the environment. It is known that ropivacaine has low solubility at pH > 6.0 and therefore, ropivacaine may have precipitated. Despite these considerations, epidural analgesia was effective since the first administration.

Reporting errors are fundamental to error prevention and so that improvements can be made to increase the safety of patients and health professionals. The inadvertent administration was reported to the hospital and new syringes for epidural administration were introduced to reduce the route of administration error.

Summary

The lack of clinical trials makes the decision on which attitude to implement difficult in cases of epidural inadvertent administration of drugs, being the sharing of errors fundamental to error prevention and to make improvements to increase safety. An identification of the syringe and routes of administration, handling of epidural catheters restricted to authorized people, and double-check before administration of any drug are recommended to prevent pharmacological administration errors.

Informed consent

The patient signed informed consent for the publication of this article.

Conflicts of interest

The authors declare no conflicts of interest.

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