

Decreased use of petidine in a private hospital with the implementation of a multiprofessional educative program *

Redução do uso de petidina em hospital privado com a implantação de um programa educativo multiprofissional

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SUMMARY

BACKGROUND AND OBJECTIVES: Morphine and petidine are the most commonly used opioids to treat pain in hospitalized patients. Morphine is recommended by the World Health Organization (WHO) and by the International Association for the Study of Pain because it is less toxic than petidine, which is still largely used in Brazil and in other developing countries. This study aimed at evaluating the decreased use of petidine after the implementation of an educative program to decrease its consumption.

METHOD: Intervention, quantitative and prospective study using as information source the pharmacy database. Petidine prescriptions were monitored with educative interventions on prescribers, orienting about drug effects and suggesting the change to a different opioid, according to criteria established by WHO and the International Association for the Study of Pain. Opioids prescription data were collected from 2005 to 2009 and

were analyzed by descriptive and inferential statistics and linear regression.

RESULTS: There has been significant decrease ($r=0.96$, $\beta=0.12$, $p=0.003$) in the use of petidine, as well as a significant increase in the use of morphine ($r=0.96$, $\beta=0.47$, $p=0.02$) during the period.

CONCLUSION: The implementation of a multidisciplinary and educational protocol to decrease petidine prescription has significantly contributed to decrease its consumption, showing the efficacy of an educative program.

Keywords: Morphine, Opioid, Pain, Petidine.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A morfina e a petidina têm sido os opioides mais comumente utilizados para o tratamento de dor em pacientes internados. A morfina é recomendada pela Organização Mundial de Saúde (OMS) e pela Associação Internacional para Estudo da Dor por ser menos tóxica que a petidina, que ainda é largamente utilizada no Brasil e em outros países em desenvolvimento. O objetivo deste estudo foi avaliar a redução do uso da petidina, após a implantação de um programa educativo visando reduzir o seu consumo.

MÉTODO: Estudo de intervenção, de natureza quantitativa e prospectiva, utilizando como fonte de informação o banco de dados da farmácia. Foram monitoradas as prescrições de petidina com intervenção educativa sobre os prescritores, orientando sobre os efeitos do fármaco e sugerindo a mudança para outro opioide, segundo os critérios estabelecidos pela OMS e *International Association for the Study of Pain*. Os dados foram levantados das prescrições de opioides durante o período de 2005 a 2009, e foram analisados por estatística descritiva e inferencial e regressão linear.

RESULTADOS: Houve redução significativa ($r=0,96$,

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beta = 0,12, p = 0,003) no uso de petidina, bem como aumento significativo do uso de morfina (r = 0,96, beta = 0,47, p = 0,02) durante o período.

CONCLUSÃO: A implantação do protocolo multidisciplinar educacional para redução da prescrição de petidina contribuiu significativamente para a redução do seu consumo, demonstrando a eficácia do programa educativo.

Descritores: Dor, Morfina, Opioide, Petidina.

INTRODUCTION

The World Health Organization (WHO) recommends the use of potent opioids for acute or severe chronic pain associated to non-opioid drugs, adjuvants and non-pharmacological techniques, aiming at decreasing pain and improving quality of life^{1,2}. Risks, benefits, availability and costs of analgesic options should be considered³. Adequate pain management is critical for the good evolution of patients because evidences show that effective postoperative analgesia contributes to earlier motility, less risk for cardiopulmonary complications, decreased hospitalization period and costs, in addition to providing more comfort and satisfaction to patients⁴⁻⁶.

Opioids are underused in Brazil due to beliefs and prejudices, as well as to inadequate information about their best use. The action mechanisms of opioids are not well known, as well as their indications and counterindications^{6,8}.

Several health agencies have proposed guidelines for opioids use^{1,2,8} and recommend restricted use of petidine, replacing it by other less toxic opioids. In addition, the use of this opioid to treat chronic pain is formally counterindicated.

In spite of the importance of opioids to treat acute and chronic pain, most Brazilian hospitals do not have data on its consumption. This study aimed at evaluating pet-

idine consumption in a private hospital after the implementation of an institutional multiprofessional protocol.

METHOD

Intervention, quantitative and retrospective study on petidine and morphine prescription from 2005 to 2009. Data related to 3406 petidine prescriptions were collected from the information records system of the pharmacy sector, were tabulated and analyzed by descriptive and inferential statistics and linear regression using the statistical program SPSS.

The implementation of the protocol to decrease petidine consumption consisted of issuing an alert by the pharmacy control system to a multidisciplinary group composed of pharmacists and nurses whenever this drug was prescribed, thus generating educational measures. The pharmacist and / or the nursing team would get in touch with the prescribing physician suggesting, in person or by telephone, and through a letter prepared by the institutional protocol, the replacement of petidine by morphine, informing about petidine toxic effects, the most adequate replacement to control pain and the options of opioids in similar analgesic doses, in addition to an algorithm to treat possible adverse effects.

RESULTS

The study was carried out in an institution treating 140 thousand patients/year and data refer to mean annual consumption of all drugs prescribed, and not only to drugs prescribed to patients under opioids (Table 1).

Although different drugs are prescribed to control acute and chronic pain, we decided to compare just the consumption of the active principle petidine with morphine, stressing that due to the difference in po-

Table 1 – Total and mean consumption by patient of petidine and morphine by period.

Years	Morphine (mg)		Petidine (mg)	
	Total consumption	consumption by patient	Total consumption	consumption by patient
2005	152,300	0.128	666,583	0.080
2006	224,400	0.191	462,833	0.040
2007	246,100	0.211	373,583	0.032
2008	313,600	0.251	331,833	0.027
2009	240,600	0.183	248,222	0.019

Petidine 100 mg, 2 mL ampule

Morphine 10 mg AP, 1 mL ampule

Value of linear regression coefficient for the use of petidine r = 0.96, beta = 0.12, p = 0.003

Value of the linear regression coefficient for the use of morphine r = 0.96, beta = 0.47, p = 0.02

tency and pharmacokinetics of drugs, prescribed doses are very different.

Results have shown a significant decrease ($r = 0.96$, $\beta = 0.12$, $p = 0.003$) in petidine use, as well as a significant increase ($r = 0.96$, $\beta = 0.47$, $p = 0.02$) in morphine use during the period. After the implementation of the protocol, petidine consumption has decreased 29% from 2005 to 2006, 17% from 2006 to 2007, 11% from 2007 to 2008 and 50% from 2008 to 2009. The decrease of petidine prescription from 2005 to 2009 was 72%.

After the implementation of the protocol, morphine prescription has increased progressively and significantly in the period from 2005 to 2009 (42%). In 2006 the increase was 49%. In 2007 the increase was 11%. When comparing 2008 to 2007, the consumption increased 17%.

In 2006, 87% of contacted physicians agreed to adhere to the institutional protocol prescribing opioids different from petidine, being that 13% continued to prescribe petidine in spite of educational measures.

During 2009, the number of physicians adhering to the protocol reached 97%.

Adhesion indices and decreased petidine consumption indicate the efficacy of the implemented protocol and were considered satisfactory according to institutional criteria.

DISCUSSION

Petidine was synthesized as an anticholinergic agent with espasmolytic function, but its analgesic properties were soon discovered and it started to be used to treat acute pain due to its availability and low cost⁹. Its use was justified because it was believed that it was the best option for cases where the muscarinic effect is undesirable. Petidine does not cause pupil constriction, is less obstipant and produces less pruritus, although having one eighth of morphine potency, with half-life of three to four hours, with shorter effect and duration than morphine and after two or three hours pain reappears being needed a new dose^{1,2,12,13}.

Its metabolite is norpetidine, excreted by the urine, with half-life of 14 to 21 hours, but may exceed 30 hours in elderly and / or kidney failure patients^{10,12}. Prolonged administration results in the building up of norpetidine, which stimulates the central nervous system (CNS) generating shivering, myoclonia, agitation, seizures and pruritus^{12,13}. Norpetidine has twice more stimulating and potentially toxic effects

in the CNS and has only half the analgesic properties of petidine.

Due to petidine adverse effects, health agencies have condemned its use^{1,4,7,8}. For example, a percentage of petidine prescriptions as compared to other opioids during hospitalization has been used as quality parameter for hospital accreditation in developed countries^{11,14}. Institutions where petidine prescriptions exceed 10% of total opioid prescriptions during hospitalization are required to have a therapeutic updating program with emphasis on opioids⁷.

Studies comparing the postoperative use of morphine and petidine show that due to adverse effects and analgesic potency, petidine is inferior to morphine^{9,12}, being indicated by some authors only to control postoperative shivering⁹. However, the treatment of shivering with clonidine, intraoperative body warming and the maintenance of central temperature significantly decrease the incidence of postoperative shivering, challenging the usefulness of pharmacological treatment with petidine¹⁵. In 2006, the Health Department recommended the exclusion of petidine from the list of essential drugs because it is three times more expensive than morphine without any therapeutic advantage⁷. There is consensus not to indicate petidine due to low cost/benefit and efficiency^{9,12}, however morphine is recognized as one of the best analgesics to treat severe pain, being the golden standard with regard to analgesic potency^{1,2}.

In spite of these evidences and of the few data on the use of opioids in Brazilian hospitals, available studies report the excessive petidine consumption^{3,14}. Data found in this study are similar to those reported by the literature, with excessive petidine use in Brazilian and other developing countries hospitals^{4,5}.

Taking into consideration that petidine should not be considered the opioid of choice to treat acute or chronic pain when opioid analgesia is needed⁴, the multidisciplinary effort of the team composed by nurses, pharmacists and physicians has led to the implementation of the protocol to decrease the use of this drug, significantly decreasing petidine prescription and increasing morphine prescription, showing that although national and international consensus on the use of opioids have been established for years, there is the need for educational interventions to manage pain and for the use of opioids in a more adequate way, since the use of opioids is, in general, inadequate.

This study has limitations because it was not possible to obtain clinical and demographic data, the number of patients and the petidine dose prescribed by patient, since

the database used operates only with absolute prescription figures.

CONCLUSION

The implementation of an educational multidisciplinary protocol to decrease petidine prescription has significantly contributed to reduce its consumption, showing the efficacy of an educative program.

REFERENCES

1. World Health Organization. Cancer pain relief. With a guide to opioid availability: In: WHO: Geneva; 1996. p. 1-70.
2. Zech DF, Grond S, Lynch J, et al. Validation of the World Health Organization Guidelines for cancer pain relief: a 10-year prospective study. *Pain* 1995;63(1):65-76.
3. Gomes ME, Evangelista PE, Mendes FF. Influence of acute pain management service on analgesic drugs cost and consumption in the post-anesthetic recovery unit. *Rev Bras Anesthesiol* 2003;53(6):808-13.
4. International Association for the Study of Pain. Cancer pain treatment. In: IASP, ed. Global year against cancer pain. Seattle: IASP; 2009 p. 1-2.
5. Soyannwo AO. Cancer pain management in developing countries. *Pain: Clinical Updates*; 2009;XVII:1-4.
6. Rizzo J. Opiofobia ou simplesmente ignorância? *Rev Dor* 2009;10(1):91.
7. Comare. Parecer de Exclusão da Comissão Técnica e Multidisciplinar de Atualização da Relação Nacional de Medicamentos Essenciais – Relação Nacional de Medicamentos Essenciais In: *Rename*: Ed. Brasília; 2006. p. 1.
8. World Health Organization. Cancer pain relief and palliative care. Technical series 804 Geneva: World Health Organization; 1990.
9. Latta KS, Ginsberg B, Barkin RL. Meperidine: a critical review. *Am J Ther* 2002;9(1):53-68.
10. Haythornthwaite JA, Menefee LA, Quatrano-Piacentini AL, et al. Outcome of chronic opioid therapy for non-cancer pain. *J Pain Symptom Manage* 1998;15(3):185-94.
11. Posso IP, Oliveira Jr JO. Os opióides e a legislação. *Rev Dor* 2009;10(4):355-69.
12. Panda M, Desbiens N, Doshi N, et al. Determinants of prescribing meperidine compared to morphine in hospitalized patients. *Pain* 2004;110(1-2):337-42.
13. Plummer JL, Owen H, Ilesley AH, et al. Morphine patient-controlled analgesia is superior to meperidine patient-controlled analgesia for postoperative pain. *Anesth Analg* 1997;84(4):794-9.
14. Daudt AW, Hadlich E, Facin MA, et al. Opiates in pain management: correct or underestimated use? Data from a university hospital. *Rev Assoc Med Bras* 1998;44(2):106-10.
15. Kranke P, Eberhart LH, Roewer N, et al. Single-dose parenteral pharmacological interventions for the prevention of postoperative shivering: a quantitative systematic review of randomized controlled trials. *Anesth Analg* 2004;99(3):718-27.

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