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ORIGINAL ARTICLE

Direct cost of connecting, maintaining and disconnecting patient-controlled analgesia pump

CUSTO DIRETO DA INSTALAÇÃO, MANUTENÇÃO E DESLIGAMENTO DA BOMBA DE ANALGESIA CONTROLADA PELO PACIENTE

COSTO DIRECTO DE LA INSTALACIÓN, MANTENIMIENTO Y DETENCIÓN DE LA BOMBA DE ANALGESIA CONTROLADA POR EL PACIENTE

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ABSTRACT

Quantitative research that aimed to identify the mean total cost (MTC) of connecting, maintaining and disconnecting patient-controlled analgesia pump (PCA) in the management of pain. The non-probabilistic sample corresponded to the observation of 81 procedures in 17 units of the Central Institute of the Clinics Hospital, Faculty of Medicine, University of Sao Paulo. We calculated the MTC multiplying by the time spent by nurses at a unit cost of direct labor, adding the cost of materials and medications/solutions. The MTC of connecting was R$ 107.91; maintenance R$ 110.55 and disconnecting R$ 4.94. The results found will subsidize discussions about the need to transfer money from the Unified Health System to hospitals units that perform this technique of analgesic therapy and it will contribute to the cost management aimed at making efficient and effective decision-making in the allocation of available resources.

DESCRIPTORS

Nursing
Pain management
Analgesia, patient-controlled
Hospital costs
Cost control

RESUMO

Pesquisa quantitativa que objetivou identificar o custo total médio (CTM) da instalação, manutenção e desligamento da bomba de analgesia controlada pelo paciente (PCA) no manejo da dor. A amostra não probabilística correspondeu à observação de 81 procedimentos em 17 Unidades do Instituto Central do Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo. Calculou-se o CTM multiplicando-se o tempo despendido pelas enfermeiras pelo custo unitário da mão de obra direta, somando-se ao custo dos materiais e medicamentos/soluções. O CTM da instalação foi de R$ 107,91; da manutenção R$ 110,55 e do desligamento R$ 4,94. Os resultados obtidos subsidiarão discussões acerca da necessidade de repasse monetário do Sistema Único de Saúde às unidades hospitalares que realizam essa técnica de terapia antálgica e contribuirão para o gerenciamento de custos visando à tomada de decisão eficiente e eficaz na alocação dos recursos disponíveis.

DESCRITORES

Enfermagem
Manejo da dor
Analgesia controlada pelo paciente
Custos hospitalares
Controle de Custos

RESUMEN

Estudio cuantitativo cuyo fue objetivo identificar el costo total promedio (CTM) de la instalación, mantenimiento y detención de la bomba de analgesia controlada por el paciente (PCA) para el manejo del dolor. La muestra no probabilística correspondió a la observación de 81 procedimientos en 17 unidades del Instituto Central del Hospital de las Clínicas de la Facultad de Medicina de la Universidad de São Paulo. Se calculó el CTM multiplicándose el tiempo dedicado por las enfermeras por el costo unitario de la mano de obra directa más el costo de los materiales y medicamentos/soluciones. El CTM de la instalación fue de R$107,91, el del mantenimiento fue de R$ 110,55 y el de la detención de la bomba fue de R$ 4,94. Los resultados pueden contribuir a las discusiones sobre la necesidad de transferir dinero del Sistema Nacional de Salud a las unidades hospitalarias que realizan esta técnica de terapia analgésica y a la gestión de los costos con el fin de favorecer la toma de decisiones eficientes y eficaces respecto al destino de los recursos disponibles.

DESCRIPTORES

Enfermería
Manejo del dolor
Analgesia controlada por el paciente
Costos de hospital
Control de costos

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INTRODUCTION

In healthcare organizations, changes with favorable cost are necessary in order to provide the analgesic therapy to increase satisfaction and improve patient mobility, ensuring his/her safety, facilitate storage and preparation of medications[1].

The implementation of a pain control service (PCS) is associated with significant reductions in the incidence of adverse effects[2]. Due to the increasing importance of these services, we highlight the relevance of assessing their costs. The knowledge around this theme is still scarce. However, hospital managers have developed studies in order to increase the allocation of resources from health systems[3].

Economic issues relating to costs in clinical practice and the search for efficiency are themes that play a crucial role within public or private healthcare institutions, which often have limited resources, requiring managers to continuously pursuit quality associated with the rational use of resources[4].

The process of cost management in the area of the Brazilian public health is challenging, since combining the commitment of providing quality services and the rational use of resources. In this scenario, there is the need for improving cost management in teaching hospitals, which provide health care aggregating teaching and research activities and are reference in technology. Its structure should offer high tech services and present the efficient use of resources. In order to do so, these hospitals must at least meet the costs of the procedures they perform[5]. However, the decision to use high technology in healthcare is often based on complex economic models and uncertain and informal judgments[6].

In recent years, many technological advances have also taken place in the field of analgesia[7], with emphasis on the technique of patient-controlled analgesia (PCA), by means of an infusion pump that enables different types of programming analgesic. PCA technique is considered safe and allows the patient to effective participate in the administration of medicines, determining when they will receive them[8].

However, access of the user population of the Unified Health System (SUS) to this therapeutic modality for the treatment of pain is limited, because there are few public health services that have this technology. In addition, SUS still does not transfer funds for the reimbursement of such treatment in health institutions.

Studies related to the association of cost-effectiveness of PCA infusion pump are scarce, considering the calculation of materials, labor, cost of maintenance and storage of infusion pump[1]. In national literature, we did not find any studies on the topic. Thus, this research proposal justifies the need for the development of studies to calculate the costs of connecting, maintaining and disconnecting the PCA pump in hospitalized patients who have acute or chronic pain.

The aim of this study was to identify the mean total cost (MTC) of connecting, maintaining and disconnecting patient-controlled analgesia pump (PCA) infusion of morphine or fentanyl in pain management.

METHOD

This is a quantitative, exploratory and descriptive study, in the form of case study. Through a case study, we seek to learn the totality of a situation, describing, understanding and interpreting the complexity of a concrete case, by a deep and exhaustive view in a delimited object[9].

The study was performed in 17 units of the Central Institute (CI), Clinics Hospital, Faculty of Medicine, University of Sao Paulo (HCFMUSP), which requested interconsultations for the Pain Control Service (PCS) in the Department of Anesthesiology. The research was developed after the approval of the Ethics Committee and Research (CAPPesq) of the Hospital (CAAE: 03794112.7.0000.0068, Evaluation number: 41230).

The PCS consists of a multidisciplinary team composed by a supervising anesthesiologist physician, four anesthesiologists physicians, a nurse and a psychiatrist. It aims to provide quality and humane care; produce scientific knowledge; train, sensitize and encourage the training of health professionals in relation to pain management.

The sample corresponded to opportunities for observation of procedures performed by nurses in the connecting, maintaining and disconnecting of the PCA pump, used for the infusion of morphine or fentanyl in patients with acute or chronic pain. The non-probability sample consisted of 81 procedures observation in the months from June to August 2012, totaling 60 days of data collection.

To measure the costs, we used the direct costs, conceptualized as relating to the production of a product or service, which can be identified and clearly quantified[10]. In hospital units, these costs are basically consisted of labor, materials and equipment used directly in the care process[11].

The direct labor (DL) refers to staff working directly on a product or service provided, since it is possible to measure the time spent and the identification of who performed the work. It involves salaries, social taxes, provisions for vacation and 13th salary[10].

The unit cost of nurses DL was estimated from the mean salaries provided by the Human Resources Service of the CH-FMUSP. Most observed nurses meet workload of 30 hours per week, so the cost corresponded to the DL: R$ 4,061.19 (payment/120 hours), R$ 33.84 (payment/hour) and R$ 0.56 (payment/minute).

We obtained the cost of materials and solutions in the Hospital Materials Management System (HMMS). The cost of the PCA pump was not considered because it is an equipment in lending contract, ie, a situation in which the company *borrows* the equipment through the purchase and consumption of specific intravenous sets.

The MTC of connecting, maintaining and disconnecting of morphine and fentanyl PCA pumps was calculated by multiplying the time spent by nurses and the unit cost of DL adding the cost of equipment, medicines and solutions. For the calculations, we used the Brazilian currency (R$), called real.

RESULTS

During the 60 days of data collection, nurses connected the PCA pump 30 times, performed its maintenances 21 times and disconnected it 30 times in 17 CI Units, CH-FMUSP, with a predominance of the Gynaecology Ward (27.63%), the Intensive Care Unit (ICU) Trauma (15.80%) and Plastic Infirmary (13.16%).

Study participants were 13 nurses whose age ranged 28-54 years (mean 40 years), time since graduation, 10 months to 37 years (mean 11 years) and service time at the institution, from three months to 37 years (mean of nine years). All had theoretical/practical training to perform the analgesic therapy, with the use of the PCA pump.

The 81 observations involved 76 patients, 43 (56.58%) were women aged 14-74 years (mean 40 years) and 33 (43.42%) were men aged between 20 and 74 years (mean 35 years). The patients that were connected and disconnected once (30 patients - 100%) of the PCA pump, however the number of maintenance per patient ranged from one to four, and more constant the performance of one maintenance (13 patients - 61.9%). The diagnoses that required more indication of use of the PCA pump were polytrauma (31.58%) and uterine fibroids (27.63%) and the most frequent surgical procedures were uterine artery embolization (27,63%) and grafting performing, debridement and dressings (23.68%), with a predominance of patients with acute pain. The morphine solution prevailed in relation to fentanyl in both connecting and in the maintenance, corresponding to 73% of connecting and 95% of maintenance.

The descriptive values of the duration of the connecting, maintaining and disconnecting the PCA pump in minutes, and its MTC in R$, including staff costs, equipment costs and solutions cost are presented below. The connecting duration of the PCA pump ranged from 9.00 to 23.00 minutes with a mean of 14.20 (SD ± 3.18) and mode of 12.00 minutes.

Table 1 - Distribution of PCA pump connecting according to duration, costs with staff, solutions and equipment - Sao Paulo, SP, Brazil, 2012

Variable	N	Mean	SD±	Median	Minimum	Maximum	Mode
Staff cost (R$)	30	7.95	1.77	7.56	5.04	12.88	6.72
Solutions cost (R$)	30	24.91	11.46	31.71	6.21	31.71	31.71
Equipment costs (R$)	30	75.05	0.14	74.97	74.97	75.44	74.97
Total costs (R$)	30	107.91	10.19	113.40	89.31	117.88	113.40

The equipment and solutions that most affected in the composition of the direct cost of the 30 connections were: PCA pump consumables (30 units - R $ 2,242.50), morphine solution bag - 100 ml (22 units: R$ 697.62) and saline solution with Fentanyl - 120ml (eight units: R$ 49.68). The MTC accumulated on the 30 connections were R$ 3,237.30 (100%), with R$ 238.50 (7.37%) with staff, R$ 747.30 (23.08%) with solutions and R$ 2,251.50 (69.55%) with material.

There was variation in the duration of the maintenance of the PCA pump between 9.00 and 12.00 minutes with a mean of 9.05 (SD ± 1.50) and mode of 9.00 minutes.

Table 2 - Distribution of maintenance of the PCA pump according to duration, costs with staff, solutions and equipment - Sao Paulo, SP, Brazil, 2012

Variable	N	Mean	SD±	Median	Minimum	Maximum	Mode
Staff cost (R$)	21	5.07	0.84	5.04	3.36	6.72	5.04
Solutions cost (R$)	21	30.50	5.56	31.71	6.21	31.71	31.71
Equipment costs (R$)	21	74.98	0.06	74.97	74.97	75.26	74.97
Total costs (R$)	21	110.55	5.57	111.72	86.51	113.40	111.16

The items that most contributed to the composition of the direct cost of the 21 maintenances were PCA pump consumables (21 units - R$ 1,569.75) and morphine solution bag - 100 ml (20 units: R$ 634.20). The MTC accumulated concerning such maintenance was R$ 2,321.55 (100%), with R$ 106.47 (4.59%) with staff, R$ 1,574.58 (67.82%) with materials and R$ 640.50 (27.59%) with solutions.

The duration of the disconnecting of the PCA pump ranged from 4.00 to 10.00 minutes with a mean of 7.37 (SD ± 1.33) and mode of 7.00 minutes.

Table 3 - Distribution of disconnecting of the PCA pump according to duration, costs with staff, solutions and equipment - Sao Paulo, SP, Brazil, 2012

Variable	N	Mean	SD±	Median	Minimum	Maximum	Mode
Staff cost (R$)	30	4.13	0.74	3.92	2.24	5.60	3.92
Solutions cost (R$)	30	0.08	0.00	0.08	0.08	0.08	0.08
Equipment costs (R$)	30	0.73	0.00	0.73	0.73	0.73	0.73
Total costs (R$)	30	4.94	0.74	4.73	3.05	6.41	4.73

The most significant equipment for the composition of the direct cost of disconnections observed were: 10 ml syringe (30 units – R$5.40); gloves for procedures (60 units: R$4.80) and luer cap (30 units: R$4.50).

The cumulative MTC on the 30 disconnecting was R$ 148.20 (100%), with R$ 123.90 (83.60%) of staff costs, R$ 21.90 (14.78%) with equipment and R$ 2.40 (1.62%) with solutions.

DISCUSSION

The patients that participated in the study showed mainly, acute pain arising from polytrauma, uterine fibroids and surgery, especially in uterine artery embolization and grafts performance, debridement and dressing, and the predominant use of morphine solution in relation to the fentanyl.

Acute pain is defined as an unpleasant sensory and emotional experience that appears from real or potential tissue damage or described in terms of such injury. It has sudden or slow onset, mild to severe, with anticipated or predictable end with duration of less than six months[12]. It is noteworthy that the intense pain is one of the main consequences of the traumas that affect a large number of victims of accidents and violence[13].

In the clinical experience of the professionals working in the PCS of the CI- CHFMUSP, pain management in multiple trauma patient involves coping with many challenges during hospitalization, such as conducting various surgical procedures, wound dressing and bed mobilization. Thus, the PCA pump is a great option for pain management for patients with this diagnosis.

Upon completion of uterine artery embolization (UAE), surgery is indicated in cases of fibroids that prevents irrigation of blood flow, reducing the size and vascularity of the tumor, patients report intense pain that can be controlled or mitigated through the PCA pump[14].

In CI-CHFMUSP, a Protocol was established by PCS aimed at patients who had undergone UAE, consisting of the indication for PCA pump infusion of morphine (bolus), anti-inflammatories, antiemetics and other drugs with analgesic properties.

The PCA technique is considered the most effective for the treatment of pain, it may be used for intravenous infusion of opioids or opioid epidural infusion associated to local anesthetics both with continuous programming of more bolus or bolus only. However, it is emphasized that the treatment of pain, in addition to being effective, must be economical, since the costs and benefits of management should be related[15].

The success of the PCA technique is mainly based on the expert supervision of nurses and anesthetists working in PCS[16]. In this sense, it is noteworthy that all nurses from CI CHFMUSP who perform connecting, maintaining and disconnecting PCA pump have the proper training and are given, when necessary, theoretical/practical support of the multidisciplinary team of PCS.

The institutional investment demonstrates the importance attached to technical and scientific training of professionals to recognize the presence of pain, assess the location, intensity, quality, duration and damage originated from it; intervene in the side effects experienced by patients who use the opioids and handling of the PCA pump.

In recent decades global changes in economic, political, social and cultural fields have been observed, which causes changes in production and in the world of work, encouraging companies to invest in new technologies and organizational concepts aimed at expanding the production of services. The health sector suffers the impact of intense change and promote the training of professionals is a key element of improving health practices[17-18]. Thus, there is an unquestionable need to provide continuous training of these professionals through reflective and participatory educational programs[18].

It is noteworthy that on the national scenario, although the Regional Nursing Council has not established standards for the connecting, maintaining or disconnecting PCA pumps, hospitals advocate such procedures should be exclusively performed by nurses, because they consider that the technique is very sophisticated and involves high technology. It is worth remembering that institutions, which use the PCA pump, also have the cost associated with maintaining a specialized service with a multidisciplinary team continually trained in pain management, along with the cost of nursing staff, equipment, solutions, among others. Hence the importance of these institutions favor the proper evaluation, control and pain relief, significant indicator of quality of life and quality of care[19].

In this study we showed that equipment and solutions corresponded to items that contributed the most to the composition of MTC connecting and maintenance of PCA pumps. The CH-FMUSP acquires these consumables

through trading session. It is a form of bidding used in Brazil which is considered as an improvement of the system of bidding for Federal Public Administration, State, Municipal and District, as it allows increase the competitiveness and expansion of opportunities for participation in bidding, on the part of bidders - citizens or juridical person interested in selling goods or services as public tenders and contracts aimed at the public interest[20].

Being a competitive mode, the trading session allows the hospital to purchase equipment and solutions for different market prices. As an example, the consumables of PCA pump, shown as the most expensive equipment for connecting and maintaining was acquired in October/2012 for R$ 74.75 per unit, which would cost R$ 90.00 on average, if it was not acquired in this way.

The Ministry of Health has a management tool to query all the procedures that can be performed in outpatient and hospital settings that composes the Procedures Table of SUS. It is called Management System of Procedures Table, Drugs, Orthotics, Prosthetics and Special Materials used by SUS (SIGTAP), it is directed to health departments, providers and public, philanthropic suppliers, private services and other users directly or indirectly connected to SUS Network[21]. However, the connecting, maintaining and disconnecting procedures of the PCA pump are not included in SIGTAP, so few institutions of public health may offer this analgesic technique to the population use, so they use its own budget.

The management of material resources has been a constant cause for concern in the healthcare, public and private organizations, due to its high cost. The rising costs of the area have mobilized health professionals, especially nurses, to acquire knowledge on the subject in order to perform studies and rationalize the process of allocation of scarce and finite resources, ensuring the balance between the costs and financial resources, as well as the increase of the results[22].

Health institutions live moments of great competitiveness in the pursuit of quality of client service by incorporating the latest technology. For this reason, control is crucial to the financial, material or property resources through cost management[23].

It is not enough that health institutions recognize pain as the fifth vital sign. It is essential that they may make investments for their management, and the availability of the PCA technique in order to avoid or minimize its harmful physical, emotional and social consequences. However, the use of technology generates costs that need to be identified and considered in the efficient allocation of available resources.

The introduction of new health technologies generates increasing demand of resources in service delivery, however, there is insufficient funding in the public sector, what gives special relevance to health economics, justifying the need for studies on the topic[24].

CONCLUSION

In pain management of patients hospitalized in the CI Units of CHFMUSP, the MTC for the connecting, maintaining and disconnecting the PCA pump infusion of morphine or fentanyl was R$ 107.91, R$ 110.55 and R$ 4.94, respectively.

The results may contribute to the management costs of staff, equipment and solutions, aiming at decision making in relation to rationalize the allocation of available resources, always limited in amount to the needs and expectations of patients in need of proper management of pain in health services.

It is considered as a limitation of the study the fact that it was conducted at a single institution. Thus, we expect this study may inspire other institutions to perform this analgesic therapy technique to develop similar studies that together subsidize discussions about the need to transfer money from SUS to hospitals that perform this treatment modality.

REFERENCES

1. Viscusi ER, Schechter LN. Patient-controlled analgesia: finding a balance between cost and comfort. Am J Health Syst Pharm. 2006;63(8 Suppl 1):S3-13; quiz S15-6.

2. Story DA, Shelton AC, Poustie SJ, Colin-Thome NJ, McIntyre RE, McNicol PL. Effect of an anaesthesia department led critical care outreach and acute pain service on postoperative serious adverse events. Anaesthesia. 2006;61(1):24-8.

3. Lee A, Chan S, Chen PP, Gin T, Lau AS. Economic evaluations of acute pain service programs: a systematic review. Clin J Pain. 2007;23(8):726-33.

4. Secoli SR, Padilha KG, Litvoc J. Cost-effectiveness analysis of the analgesic therapy of postoperative pain. Rev Latino Am Enferm. 2008;16(1):42-6.

5. Dallora MELV, Forster AC. The real importance of cost management in a teaching hospital - theoretical considerations. Medicina (Ribeirão Preto). 2008;41(2):135-42.

6. Bujkiewicz S, Jones HE, Lai MC, Cooper NJ, Hawkins N, Squires H, et al. Development of a transparent interactive decision interrogator to facilitate the decision-making process in health care. Value Health. 2011;14(5):768-76.

7. Vadivelu N, Mitra S, Narayan D. Recent advances in postoperative pain management. Yale J Biol Med. 2010;83(1):11-25.

8. Nikolajsen L, Haroutiunian S. Intravenous patient-controlled analgesia for acute postoperative pain. Eur J Pain Suppl. 2011;5(2):453-6.

9. Yin RK. Estudo de caso: planejamento e método. 4ª ed. Porto Alegre: Bookman; 2010.

10. Martins E. Contabilidade de custos. 10ª ed. São Paulo: Atlas, 2010.

11. Lima AFC, Castilho V, Fugulin FMT, Silva B, Ramin NS, Melo TO. Costs of most frequent nursing activities in highly dependent hospitalized patients. Rev Latino Am Enferm. 2012;20(5):880-7.

12. NANDA International. Nursing diagnoses: definitions and classification 2012-2014. Oxford: Wiley Blackwell; 2012.

13. Calil AM, Pimenta CAM. Pain intensity of pain and adequacy of analgesia. Rev Latino Am Enferm. 2005;13(5):692-9.

14. Vo NJ, Andrews RT. Uterine artery embolization: a safe and effective, minimally invasive, uterine-sparing treatment option for symptomatic fibroids. Semin Intervent Radiol. 2008;25(3):252-60.

15. Stratmann L, Nelles S, Heinen-Kammerer T, Rychlik R. Costs of patient controlled analgesia in postoperative pain management in Germany. Schmerz. 2007;21(6):514-21.

16. Mann C, Ouro-Bang'na F, Eledjam JJ. Patient-controlled analgesia. Curr Drug Targets. 2005;6(7):815-9.

17. Santana N, Fernandes JD. The process of professional qualification for the critical care nurse. Rev Bras Enferm. 2008;61(6):809-15.

18. Ferreira JCOA, Kurcgant P. Directors of nursing point of view of the professional capacitating program for nurses working in major teaching medical centers. Acta Paul Enferm. 2009;22(1):31-6.

19. Kurita GP, Pimenta CAM, Oliveira Junior JO, Caponeiro R. Alteration in attention and cancer pain treatment. Rev Esc Enferm USP. 2008;42(1):143-51.

20. Brasil. Lei n. 10.520, de 17 de julho de 2002. Institui no âmbito União, Estados, Distrito Federal e Municípios, nos termos do art. 37, inciso XXI, da Constituição Federal a modalidade de licitação denominada pregão, para aquisição de bens e serviços comuns e dá outras providências [Internet]. Brasília; 2002 [citado 2013 maio 15]. Disponível em: http://www.planalto.gov.br/ccivil_03/leis/2002/l10520.htm

21. Brasil. Ministério da Saúde; Secretaria de Atenção à Saúde, Departamento de Regulação, Avaliação e Controle. Sistema de Gerenciamento da Tabela de Procedimentos, Medicamentos e OPM do SUS - SIGTAP: manual operacional [Internet]. Brasília; 2011 [citado 2013 maio 10]. Disponível em: http://portal.saude.gov.br/portal/arquivos/pdf/manual_sigtap_desktop2.pdf

22. Castilho V, Gonçalves VLM. Gerenciamento de recursos materiais. In: Kurcgant P, coordenadora. Gerenciamento em enfermagem. 2ª ed. Rio de Janeiro: Guanabara Koogan; 2010. p.155-67.

23. Oliveira WT, Rodrigues AVD, Haddad MCL, Vannuch MTO, Taldivo MA. Conceptions of nurses from a public university hospital regarding the cost management report. Rev Esc Enferm USP [Internet]. 2012 [cited 2013 May 10];46(5):1184-91. Available from: http://www.scielo.br/pdf/reeusp/v46n5/en_21.pdf

24. Bonacim CAG, Araujo AMP. Gestão de custos aplicada a hospitais universitários públicos: a experiência do Hospital das Clínicas da Faculdade de Medicina de Ribeirão Preto da USP. Rev Adm Pública. 2010;44(4):903-31.

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