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## SCIENTIFIC ARTICLE

# The impact of patients controlled analgesia undergoing orthopedic surgery<sup>☆</sup>



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### KEYWORDS

Analgesia;  
PCA;  
Pain;  
Orthopedic surgery;  
Postsurgical;  
Rehabilitation

### Abstract

**Introduction:** The currently common musculoskeletal disorders have been increasingly treated surgically, and the pain can be a limiting factor in postoperative rehabilitation.

**Rationale:** Patient controlled analgesia (PCA) controls pain, but its adverse effects can interfere with rehabilitation and in the patient discharge process. This study becomes important, since there are few studies evaluating this correlation.

**Objectives:** To compare the outcomes of patients who used and did not use patient controlled analgesia in postoperative orthopedic surgery with respect to pain, unscheduled need for O<sub>2</sub> (oxygen), and time of immobility and in-hospital length of stay.

**Methods:** This is an observational, prospective study conducted at Hospital Abreu Sodré from May to August 2012. The data was daily obtained through assessments and interviews of patients undergoing total hip arthroplasty (THA) and total knee arthroplasty (TKA), thoracolumbar spine arthrodesis (long PVA), cervical spine arthrodesis (cervical AVA) and lumbar spine arthrodesis (lumbar PVA).

**Results:** The study showed some differences between groups, namely: the painful level was higher in the group undergoing lumbar PVA without PCA compared with the group with PCA ( $p=0.03$ ) and in the group of long PVA without PCA in the early postoperative period. This latter group used O<sub>2</sub> for a longer time ( $p=0.09$ ).

**Conclusion:** In this study, PCA was useful for analgesia in patients undergoing lumbar PVA and probably would have influenced the usage time of O<sub>2</sub> in the group of long PVA in face of a larger sample. The use of PCA did not influence the time of leaving the bed and the in-hospital length of stay for the patients studied.

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**PALAVRAS-CHAVE**

Analgesia;  
PCA;  
Dor;  
Cirurgia ortopédica;  
Pós-cirúrgico;  
Reabilitação

**O impacto da analgesia controlada pelos pacientes submetidos a cirurgias ortopédicas****Resumo**

*Introdução:* As disfunções musculoesqueléticas, comuns atualmente, têm sido cada vez mais tratadas cirurgicamente, e a dor é pode ser um fator limitante na reabilitação pós-operatória.

*Justificativa:* A Analgesia Controlada pelo Paciente (PCA) controla a dor, porém seus efeitos adversos podem interferir no processo de reabilitação e alta dos pacientes. Esta pesquisa torna-se importante, pois poucos estudos avaliam essa correlação.

*Objetivos:* Comparar a evolução dos pacientes que usaram e não usaram PCA no pós-operatório de cirurgias ortopédicas em relação à dor, necessidade de O<sub>2</sub> (oxigênio) não programada e tempo imobilismo e internação hospitalar.

*Métodos:* Estudo observacional, prospectivo, realizado no Hospital Abreu Sodré de maio a agosto de 2012. Obteve-se dados diários através de avaliação e entrevista dos pacientes submetidos à artroplastia total de quadril (ATQ) e joelho (ATJ), artrodese de coluna toracolombar (AVP longa), coluna cervical (AVA cervical) e coluna lombar (AVP lombar).

*Resultados:* O estudo evidenciou algumas diferenças entre os grupos, sendo elas: o nível algico foi maior no grupo submetido à AVP lombar sem PCA em relação ao com PCA ( $p=0,03$ ) e no grupo de AVP longa sem PCA no primeiro pós-operatório. Nesse último grupo, houve uso de O<sub>2</sub> por mais tempo ( $p=0,09$ ).

*Conclusão:* Nesse estudo, a PCA mostrou-se útil para analgesia em pacientes submetidos à AVP lombar e provavelmente teria influência no tempo de uso de O<sub>2</sub> no grupo de AVP longa, caso a amostra fosse maior. O uso da PCA não influenciou no tempo de saída do leito e de internação hospitalar nos pacientes estudados.

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**Introduction**

Currently, musculoskeletal disorders have become a common problem, in part due to increased life expectancy and incidence of obesity in the world population. These disorders cause functional limitations that invariably have a progressive course if not managed properly.<sup>1-3</sup>

Treatment may be conservative with control of symptoms through medication, physical or surgical rehabilitation, with repair and/or replacement of damaged joints.<sup>2</sup>

Surgical techniques have been improved rapidly in the last decades, but it does not always impact the postoperative rehabilitation of patients. Pain severity and length of hospital stay, especially when added to a previous status of limitation, in addition to complications associated with the anesthetic and surgical procedure,<sup>4</sup> result in greater morbidity and functional loss<sup>5</sup> and may affect prognosis.<sup>6-8</sup>

Pain is one of the main factors limiting ambulation, increasing the risk of thromboembolism by immobility and causing metabolic changes that affect other systems. Therefore, individualized pain management with the use of appropriate analgesic techniques is of paramount importance. Moreover, early intervention of rehabilitation aiming at a better postoperative recovery<sup>6,9-11</sup> may reduce the length of hospital stay and return to daily activities.<sup>12,13</sup>

There are several techniques of analgesia; however, the use of patient-controlled analgesia (PCA) is increasingly present in hospitals. This method, which is considered safe and effective for treating moderate to severe pain,<sup>6,14,15</sup> is used since the 1970s.

PCA pumps are infusion devices that allow various forms of programming and whose drug administration may be intravenous or epidural, continuously or through a device to request bolus doses (intermittent). The patient operates the device, if necessary. This analgesic technique is often used in cases of severe pain, such as after orthopedic surgery,<sup>6</sup> or chronic pain, such as patients with advanced malignancies undergoing palliative care.

On the other hand, the use of PCA may be associated with hypotension, urinary retention, and motor blockade, which limits mobilization and, with high doses of opioids, it may result in sedation, respiratory depression, constipation, confusion, urinary retention, nausea, vomiting, and pruritus.<sup>7</sup> It is noteworthy that respiratory depression is the most troubling adverse effect. It is expressed by decreased peripheral oxygen saturation (SpO<sub>2</sub>) and respiratory rate, as suggested by some authors. The oxygen requirement for hypoxemia management may prolong hospitalization, with consequent delay in rehabilitation.<sup>9,16,17</sup>

Brazilian literature is scarce in studies assessing the impact of PCA in clinical outcome and rehabilitation of patients after orthopedic surgery. The aim of this study was to compare the outcome of patients submitted to orthopedic surgery, with and without PCA, regarding the need for supplemental O<sub>2</sub>, patient bed time, length of hospital stay, and level of pain.

Thus, it is possible to identify situations that may affect the time it takes the patient to return to daily activities, in order to intervene with prophylactic resources and improve postoperative rehabilitation. These factors are important for the quality of care provided, and impact on cost

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