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SCIENTIFIC ARTICLE

Use of tranexamic acid in primary total knee replacement: effects on perioperative blood loss

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KEYWORDS
Anesthesia;
Tranexamic acid;
Knee prosthesis;
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Blood transfusion

Abstract
Background and objectives: The use of tranexamic acid in primary total knee replacement surgeries has been the subject of constant study. The strategies to reduce bleeding are aimed at reducing the need for blood transfusion due to the risks involved. In this study we evaluated the use of tranexamic acid in reducing bleeding, need for blood transfusion, and prevalence of postoperative deep vein thrombosis in primary total knee replacement.
Method: 62 patients undergoing primary total knee replacement were enrolled in the study, from June 2012 to May 2013, and randomized to receive a single dose of 2.5 g of intravenous tranexamic acid (Group TA) or saline (Group GP), 5 min before opening the pneumatic tourniquet, respectively. Hemoglobin, hematocrit, and blood loss were recorded 24 h after surgery. Deep vein thrombosis was investigated during patient's hospitalization and 15 and 30 days after surgery in review visits.
Results: There was no demographic difference between groups. Group TA had 13.89% decreased hematocrit ($p = 0.925$) compared to placebo. Group TA had a decrease of 12.28% ($p = 0.898$) in hemoglobin compared to Group GP. Group TA had a mean decrease of 187.35 mL in blood loss (25.32%) compared to group GP ($p = 0.027$). The number of blood transfusions was higher in Group GP ($p = 0.078$). Thromboembolic events were not seen in this study.

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Conclusion: Tranexamic acid reduced postoperative bleeding without promoting thromboembolic events.

PALAVRAS-CHAVE
Anestesia;
Ácido tranexâmico;
Prótese do joelho;
Sangramento;
Transfusão de sangue

Uso do ácido tranexâmico em artroplastia total primária de joelho: repercussões na perda sanguínea perioperatória

Resumo
Justificativa e objetivos: O uso do ácido tranexâmico, em cirurgias de artroplastia total primária de joelho, tem sido objeto de constante estudo. As estratégias para redução de sangramento visam à redução da necessidade de transfusão de sangue devido aos riscos que apresentam. Neste estudo, propomos a avaliação do uso do ácido tranexâmico na redução do sangramento, na necessidade de transfusão de sangue e na prevalência de trombose venosa profunda (TVP) pós-operatória em artroplastia total primária de joelho.
Método: Foram estudados 62 pacientes submetidos à artroplastia primária total de joelho, de junho de 2012 a maio de 2013, randomizados para receber ácido tranexâmico 2,5 g endovenoso (grupo AT), em dose única, ou soro fisiológico (grupo GP), cinco minutos antes da abertura do torniquete pneumático, respectivamente. Foram feitas dosagens de hemoglobina e hematócrito e medida a perda sanguínea 24 horas após a cirurgia. A TVP foi pesquisada durante a internação do paciente, 15 e 30 dias após a cirurgia nas consultas de revisão.
Resultados: Não houve diferenças demográficas entre os grupos estudados. O grupo GT apresentou queda do hematócrito 13,89% (p = 0,925) comparado com o grupo placebo. O grupo GT apresentou diminuição de 12,28% (p = 0,898) da hemoglobina comparado com o grupo GP. O grupo GT apresentou uma diminuição média de 187,35 ml nas perdas sanguíneas (25,32%) quando comparado com o grupo GP (p = 0,027). O número de transfusões sanguíneas foi maior no grupo GP (p = 0,078). Eventos tromboembólicos não foram evidenciados neste estudo.
Conclusões: O ácido tranexâmico diminuiu o sangramento pós-operatório sem promover eventos tromboembólicos.

Introduction

The proposal to use tranexamic acid as a strategy to reduce blood loss in surgery of primary total knee replacement has been the subject of constant study, because it is a procedure associated with significant amounts of bleeding that can reach 20% of the volume in patients with significant comorbidities related to cardiovascular, cerebrovascular, and metabolic systems, due to the epidemiological characteristics of knee osteoarthritis/arthrosis.[1]

In these patients, blood loss leading to a perioperative anemia promotes high morbidity and mortality.[2] Patients with perioperative anemia have a longer hospital stay associated with a greater need for the use of resources, including blood transfusions, blood products, and admission to the intensive care unit.[3–5]

Strategies for reducing bleeding have been used to reduce the need for transfusion of blood and its products due to the associated risks.[4] Not only the transmission of viral and bacterial diseases, but the immunomodulation related to homologous transfusion has been a growing concern, especially as we evidence an increase in the prevalence of prostheses infections, immunosuppression, and the already seen relationship of neoplasms arising in patients receiving this type of transfusion.[4,6–8]

In this study, we propose to evaluate the use of tranexamic acid in reducing bleeding, need for transfusion of blood and blood products, and prevalence of postoperative deep venous thrombosis in primary total knee replacement.

Methods

After approval by the local Research Ethics Committee and obtaining written informed consent, 62 patients undergoing primary total knee replacement due to osteoarthrosis or rheumatoid arthritis, from June 2012 to May 2013, were randomized to receive intravenous tranexamic acid 2.5 g (Group TA) as a single dose or saline solution (Group P) 5 min before the opening of the pneumatic tourniquet, respectively. Exclusion criteria were patient's refusal to participate in the study, allergies to drugs used, changes related to coagulation, use of nonsteroidal anti-inflammatory or antiplatelet drugs seven days before surgery, kidney or liver failure,