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Original Article

Total knee arthroplasty: indication of blood transfusion according to hematimetric variation and clinical symptoms of hypoperfusion^{☆,☆☆}



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ARTICLE INFO

Article history:

Received 12 August 2013

Accepted 12 September 2013

Available online 13 August 2014

Keywords:

Hemoglobin

Surgical blood loss

Joints

Arthroplasty

Hypovolemia

ABSTRACT

Objective: To analyze the relationship between hematimetric variation and the presence of clinical symptoms of hypoperfusion for indicating blood transfusion in patients undergoing total knee arthroplasty.

Methods: A retrospective analysis was conducted on data gathered from the medical files of 55 patients with a diagnosis of gonarthrosis, who underwent total knee arthroplasty at a hospital orthopedics and traumatology service between February 2011 and December 2012. The patients studied presented unilateral joint degeneration and fitted into the indications for surgical treatment. All the patients underwent a preoperative cardiologic evaluation, presenting a pattern of ASA I–III and absence of blood dyscrasia, and preoperative hemoglobin measurements were made. However, no minimum hematimetric value was established for the surgical treatment; there were only clinical criteria for blood perfusion.

Results: Among the 55 patients, 35 were female and 20 were male, and the mean age was 68 years. Six patients underwent homologous blood transfusion, because of their clinical condition of tissue hypoperfusion, persistent hypotension, loss of consciousness, sweating and coercible vomiting. They presented postoperative hemoglobin of 7.5–8.8 g/dL.

Conclusion: For patients with falls in hemoglobin counts greater than 20% and values lower than 9 g/dL after the surgery, there is a possible need for blood transfusion, which should only be indicated when accompanied by major symptoms of tissue hypoperfusion.

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[☆] Please cite this article as: Tavares Cardozo R, Fidelis de Souza Junior E, Campoli Alves W, Barbi Filho F. Artroplastia total do joelho: indicação de transfusão sanguínea de acordo com a variação hematimétrica e os sintomas clínicos de hipoperfusão. Rev Bras Ortop. 2014;49(5):507–512.

^{☆☆} Work developed at the Orthopedics and Traumatology Service, Hospital São Francisco, Ribeirão Preto, SP, Brazil.

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<http://dx.doi.org/10.1016/j.rboe.2013.09.002>

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Artroplastia total do joelho: indicação de transfusão sanguínea de acordo com a variação hematimétrica e os sintomas clínicos de hipoperfusão

R E S U M O

Palavras-chave:

Hemoglobina
Perda sanguínea cirúrgica
Articulações
Artroplastia
Hipovolemia

Objetivo: Analisar a relação entre a variação hematimétrica e a presença de sintomas clínicos de hipoperfusão para a indicação de transfusão sanguínea em pacientes submetidos a artroplastia total do joelho.

Métodos: Fez-se uma análise retrospectiva dos dados coletados nos prontuários de 55 pacientes com diagnóstico de gonartrose submetidos a artroplastia unilateral total do joelho feita pelo serviço de ortopedia e traumatologia de um hospital de fevereiro de 2011 a dezembro de 2012. Os pacientes estudados apresentaram degeneração articular unilateral e se enquadraram na indicação para o tratamento cirúrgico. Todos foram submetidos a avaliação pré-operatória cardiológica e manteve-se um padrão correspondente a ASA-I até III, ausência de discrasia sanguínea e mensuração de hemoglobina pré-operatória. Porém, não foi estabelecido valor hematimétrico mínimo para o tratamento cirúrgico, apenas critérios clínicos de perfusão sanguínea.

Resultados: Dos 55 pacientes, 35 do sexo feminino e 20 do masculino, com média de 68 anos, apenas seis foram submetidos a transfusão sanguínea homóloga, decorrente do quadro clínico de hipoperfusão tecidual, hipotensão persistente, perda da consciência, sudorese e vômitos coerçíveis e apresentaram hemoglobina pós-operatória entre 7,5 e 8,8 g/dL.

Conclusão: Pacientes com queda acima de 20% na contagem de hemoglobina e valores abaixo de 9 g/dL após a cirurgia sugerem uma possível necessidade de transfusão sanguínea, que só deve ser indicada quando acompanhada de sintomas maiores de hipoperfusão tecidual.

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Introduction

Total knee arthroplasty (TKA) is one of the surgical procedures most indicated for treating osteoarthritis,¹ which is a disease of inflammatory and degenerative nature that causes destruction of the knee joint cartilage and leads to joint deformity.² TKA is an increasingly common procedure,³⁻⁶ but it is associated with major postoperative blood losses that may reach quantities greater than or equal to 1.5L. In such cases, transfusion becomes inevitable.^{7,8} The bleeding occurs mainly after removal of the tourniquet.^{9,10}

It is understood that in cases of trauma and in large-scale surgical procedures like TKA, in which there is acute blood loss, oxygenation is the main indicator regarding blood volume replacement. This is a decisive moment, at which replacement should be performed using blood or blood components, rather than by means of acellular solutions alone. Thus, transfusions can be done using homologous blood donated by another person, or using autologous blood, in which the donor and recipient are the same person. In most cases, transfusion using homologous blood is done more often.¹¹

However, if the indications for transfusions are analyzed, it is seen that there is no consensus regarding what the minimum acceptable value for the hemoglobin level would be, for adequate tissue perfusion to be maintained. Discrepant values have been reported, ranging from levels as low as 1.8 g/dL to normal levels like 12 g/dL.¹²

The present study had the aim of analyzing the relationship between the hematimetric variation and the presence

of clinical symptoms of hypoperfusion, for indicating blood transfusion in patients undergoing TKA.

Materials and methods

A retrospective analysis was conducted on data gathered from the medical files of 55 patients who underwent unilateral TKA, performed at the orthopedics and traumatology service of a hospital between February 2011 and December 2012. Among these patients, 35 (63.63%) were female and 20 (36.36%) were male, and the mean age was 68.3 years (range: 45–86), as can be seen in [Fig. 1](#).

All the procedures were performed by a team of surgeons with experience of the surgical technique of unilateral TKA.

As inclusion criteria, the patients needed to present primary gonarthrosis with an indication for TKA, undergo a preoperative cardiologic assessment, remain within categories I–III of the American Society of Anesthesiology (ASA), present absence of blood dyscrasia and have preoperative

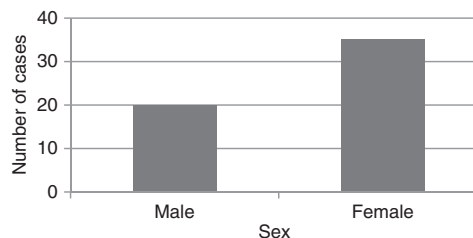


Fig. 1 – Number of cases according to gender.

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