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REVIEW ARTICLE

Effectiveness of combined regional-general anesthesia for reducing mortality in coronary artery bypass: meta-analysis☆

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KEYWORDS
General anesthesia;
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Abstract
Background and objectives: Neuraxial anesthesia (NA) has been used in association with general anesthesia (GA) for coronary artery bypass; however, anticoagulation during surgery makes us question the viability of benefits by the risk of epidural hematoma. The aim of this study was to perform a meta-analyzes examining the efficacy of NA associated with GA compared to GA alone for coronary artery bypass on mortality reduction.
Methods: Mortality, arrhythmias, cerebrovascular accident (CVA), myocardial infarction (MI), length of hospital stay (LHS), length of ICU stay (ICUS), reoperations, blood transfusion (BT), quality of life, satisfaction degree, and postoperative cognitive dysfunction were analyzed. The weighted mean difference (MD) was estimated for continuous variables, and relative risk (RR) and risk difference (RD) for categorical variables.
Results: 17 original articles analyzed. Meta-analysis of mortality (RD = −0.01, 95% CI = −0.03 to 0.01), CVA (RR = 0.79, 95% CI = 0.32–1.95), MI (RR = 0.96, 95% CI = 0.52–1.79) and LHS (MD = −1.94, 95% CI = −3.99 to 0.12) were not statistically significant. Arrhythmia was less frequent with NA (RR = 0.68, 95% CI = 0.50–0.93). ICUS was lower in NA (MD = −2.09, 95% CI = −2.92 to −1.26).
Conclusion: There was no significant difference in mortality. Combined NA and GA showed lower incidence of arrhythmias and lower ICUS.

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PALAVRAS-CHAVE
Anestesia geral;
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Revascularização miocárdica

Efetividade da associação da anestesia regional à anestesia geral na redução da mortalidade em revascularização miocárdica: metanálise

Resumo
Introdução e objetivos: A anestesia neuroaxial (AN) vem sendo utilizada em associação com a anestesia geral (AG) para revascularização miocárdica, entretanto a anticoagulação durante a cirurgia torna questionável a viabilidade dos benefícios mediante o risco de hematoma de espaço peridural. O objetivo deste estudo foi executar metanálises analisando a efetividade da AN associada à AG comparada à AG isolada para a cirurgia de revascularização miocárdica relativa à redução da mortalidade.
Métodos: Foram analisados mortalidade, arritmias, acidente vascular cerebral (AVC), infarto miocárdico (IM), tempo de internação hospitalar (TIH), tempo de internação em unidade de terapia intensiva (TUTI), reoperações, transfusão sanguínea (TS), qualidade de vida, grau de satisfação e disfunção cognitiva pós-opertória. A diferença média (DM) ponderada foi estimada para as variáveis contínuas e risco relativo (RR) e a diferença de risco (DR) para variáveis categóricas.
Resultados: Analisados 17 artigos originais. Metanálise da mortalidade (DR = −0,01; IC 95% = −0,03 a 0,01), AVC (RR = 0,79; IC 95% = 0,32 a 1,95), IM (RR = 0,96; IC 95% = 0,52 a 1,79) e TIH (DM = −1,94; IC 95% = −3,99 a 0,12) não demonstraram significância estatística. Arritmia foi menos frequente com AN (RR = 0,68; IC 95% = 0,50 a 0,93). O TUTI foi menor no com AN (DM = −2,09; IC 95% = −2,92 a −1,26).
Conclusão: Não se observaram diferenças estatisticamente significantes quanto a mortalidade. A combinação de AN e AG mostrou menor incidência de arritmias e menor TUTI.

Introduction

Coronary artery bypass grafting occurs in approximately 800,000 patients annually.[1] There is an increased interest in the use of neuraxial anesthesia (NA), spinal and epidural anesthesia, associated with general anesthesia (GA) for coronary artery bypass, which is also a matter for further research worldwide.[2] The risks and benefits of NA in this setting have been reviewed in adult patients.[2]

One of the benefits of NA is to mitigate the response to surgical stress due to blockage of cardioaccelerator fibers, T1 to T5, and improved coronary response to vasodilators improving the balance between the supply and consumption of myocardial oxygen.[2,3] Sympathetic activation is considered the main mechanism for the occurrence of new myocardial infarction in the postoperative period.[3]

The use of NA in heart surgery is still controversial due to the possibility of hematoma or abscess at the puncture site and the possibility of spinal compression.[4] The current data available in the literature were used in mathematical models to estimate the maximum risk of this event after full heparinization, which was estimated at 1:2400 with full heparinization.[4]

The aim of this study was to perform a meta-analyzes to evaluate the effectiveness of neuraxial anesthesia associated with general anesthesia compared to general anesthesia alone for coronary artery bypass grafting regarding the reduction of mortality.

Method

Systematic review was performed following a protocol developed prior of the performing this review. This protocol, as well as the review performance, followed the steps suggested by The Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement.[5] The stages of this research were: systematic literature search, careful analysis for inclusion and exclusion of studies, analysis of the quality of studies, data collection of outcome variables, meta-analytic calculations, analysis of sensitivity and homogeneity, and trial sequential analysis. All stages performed are described below.

Search strategy

The identification and systematic search for potentially relevant original articles was performed in the following databases: Medline via PubMed from January 1966 to January 2014, Cochrane Central Register of Controlled Trials (CENTRAL) n° 3 (2014), Excerpta Medica Database (EMBASE) from January 1974 to January 2014, and *Literatura Latino-Americana e do Caribe em Ciências da Saúde* (Lilacs) from January 1982 to January 2014. The references of included