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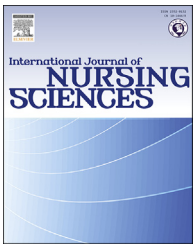

Original Article

Case management does not decrease mortality of patients with myocardial infarction or unstable angina: Evidence from a systematic review

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ABSTRACT

Objective: To objectively assess the impact of case management on patients with myocardial infarction or unstable angina.

Methods: PubMed, EMBASE, Web of Science, Cochrane Library, China National Knowledge Infrastructure (CNKI), and Chinese Biomedical Literature Database were searched for relevant randomized controlled trials (RCTs) published through February 2015. The quality of eligible studies was independently assessed by two investigators. The primary outcome assessed from included studies was all-cause mortality, with total cholesterol, systolic and diastolic blood pressures, smoking cessation rates and cost-effectiveness as secondary outcomes. The pooled effect sizes were expressed as relative risk, odds risk, and standard mean difference with 95% confidence intervals. Heterogeneity among studies was assessed using Cochrane Q and determined with an I^2 statistic.

Results: After the initial search, a total of four studies divided into six RCTs that included 1293 participants met the inclusion criteria and were analyzed. The results of meta- and descriptive analyses failed to identify any significant differences in all-cause mortality during the follow-up period of up to 36 months. Furthermore, a definitive conclusion for remaining indicators could not be drawn due to limited evidence.

Conclusion: Case management is not beneficial to all-cause mortality after myocardial infarction or unstable angina compared to routine care. Additional, prospective RCTs of high quality and large scale are warranted to verify these results.

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1. Introduction

Myocardial infarction (MI) is one of the leading contributors to cardiovascular-related deaths worldwide. An estimated 36,6698 new MI cases are diagnosed annually in America, which are responsible for 5,5005 deaths [1]. MI is often preceded by unstable angina (UA), which may be an indicator of severe coronary artery disease [2]. With the modification of major risk factors and advancement in treatments, mortality from acute MI and UA has declined in recent years [3,4]. Nevertheless, survivors remain at risk for fatal or nonfatal heart events [5]. Moreover, MI and UA patients frequently have multiple pre-existing comorbidities such as diabetes mellitus, hypertension and hyperlipidemia [8–10] that also affect the quality of life and prognosis.

Case management (CM) is a collaborative and a multidisciplinary practice designed to promote quality of care and meet the health needs of the individual and their family, while ultimately achieving cost-effectiveness of medical nursing. CM comprises three basic elements, namely systematic monitoring of patients, support for continuation of treatment, and interventional measures in cases of low compliance or with no obvious improvement [11]. Different from disease management, CM not only focus on the disease entity, but also pay attention to disease-related risk factors (abnormal level of blood pressure and blood glucose) and patient-related factors (deficiency of knowledge about cardiovascular diseases) that prevent the rehabilitation processes [12–15]. Hence, it may be a better choice for patients with multiple comorbidities.

Several studies have investigated the effects of CM on patients with acute cardiovascular diseases, such as MI and UA, but have not provided conclusive results. To address this, a systematic review and meta-analysis of all available, relevant randomized controlled trials (RCTs) was performed to objectively assess the impact of CM on these conditions.

2. Methods

The Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) Statement [16] and Cochrane Handbook for Systematic Reviews of Interventions [17] were adopted to guide this systematic review and meta-analysis. All pooled analyses were based on previously published studies, and thus no ethical approval or patient informed consent was required.

2.1. Search strategies

PubMed, EMBASE, Web of Science, Cochrane Library, China National Knowledge Infrastructure and Chinese Biomedical Literature Database were searched to identify potentially relevant RCTs published through February 2015. The search strategies utilized are shown in Appendix A. The reference lists of included articles were also manually searched to identify any additional eligible studies.

2.2. Study selection

RCTs that involved patients diagnosed with MI or UA were selected for analysis. Inclusion criteria were studies where CM alone or combination with other forms of treatment was used in the study group and routine or other viable interventions were used for the control group. The primary outcome from included studies was all-cause mortality, with total cholesterol, systolic and diastolic blood pressures, smoking cessation rates and cost-effectiveness as secondary outcomes. Only studies published in English or Chinese were included. Studies that specifically assessed the comprehensive effect of CM plus other interventions were excluded. Studies with data that was incomplete or not reported in sufficient detail were excluded from analyses.

2.3. Data abstraction

Two investigators (L.-J. Yi and T. Shuai) independently extracted the following basic information and continuous and binary data from each included study: first author and publication year, country of origin, target diseases, sample size, randomization method, age of participants, interventions, reported outcome of interest and intervention time. Corresponding authors of the studies would be contacted to acquire the complete data if necessary. Any discrepancies between investigators concerning the eligibility of a study were resolved by consensus or consulting a third investigator (X. Tian).

2.4. Quality appraisal

The quality of articles included in the study was assessed independently by two investigators (Z. Zeng and L. Ma) using the Cochrane Risk of Bias tool [17]. This tool addresses six specific domains: sequence generation, allocation concealment, blinding, incomplete outcome data, selective outcome reporting, and other issues. The bias risk of each incorporated study was rated as "high", "unclear" or "low" according to the adequacy level of information extracted. Any discrepancies between investigators concerning the quality of the studies was resolved by consulting a third investigator (G.-M. Song).

2.5. Statistical analyses

Primary and secondary outcomes from all included studies were calculated. Heterogeneity was evaluated using the χ^2 test with corresponding p value, and the level of heterogeneity was quantified using the I^2 statistic. An $I^2 \geq 50\%$ indicated heterogeneity, in which case a random-effects model was used, otherwise a fixed-effects model was used. The pooled effect size was expressed as relative risk (RR), odds ratio or standard mean difference (SMD) with 95% confidence intervals (CI). A two-sided $p < 0.05$ indicated statistical significance. A descriptive analysis was utilized to objectively present the results from eligible studies in terms of outcomes of interest that were not suitable for quantitative analysis. All pooled analyses were performed using Review Manager v5.3.0 (Cochrane Collaboration, Copenhagen, Denmark). A sensitivity analysis was conducted to determine the possible