

Available online at www.sciencedirect.com

ScienceDirect

The Surgeon, Journal of the Royal Colleges
of Surgeons of Edinburgh and Irelandwww.thesurgeon.net

Review

Decompressive hemicraniectomy in patients with malignant middle cerebral artery infarction: A systematic review and meta-analysis



Ming-Hao Yang^{a,1}, Hong-Yu Lin^{b,1}, Jun Fu^c, Gopaul Roodrajeetsing^a,
Sheng-Liang Shi^b, Shao-Wen Xiao^{a,*}

^a Department of Neurosurgery, First Affiliated Hospital of Guangxi Medical University, Nanning, Guangxi Zhuang Autonomous Region, China

^b Department of Neurology, First Affiliated Hospital of Guangxi Medical University, Nanning, Guangxi Zhuang Autonomous Region, China

^c Department of Histology and Embryology, School of Pre-clinical Medicine, Guangxi Medical University, Nanning, Guangxi Zhuang Autonomous Region, China

ARTICLE INFO

Article history:

Received 28 November 2014

Accepted 30 December 2014

Available online 7 February 2015

Keywords:

Decompressive hemicraniectomy

Middle cerebral artery

Infarction

Meta-analysis

ABSTRACT

Background & purpose: Malignant middle cerebral artery infarctions (mMCAI) are one of the most devastating ischemic strokes, with up to 80% mortality in non-surgically treated patients. With the publication of three European randomized controlled trials (RCTs), decompressive hemicraniectomy (DHC) was recommended in patients with mMCAI who are aged ≤ 60 years. Recently, three other RCTs enrolling patients aged >60 years were published; thus, it is necessary to update the previous meta-analysis to re-evaluate the effects of DHC in mMCAI.

Methods: A systematic literature search of PubMed, EMBASE, and the Cochrane Library was conducted for published RCTs investigating the effects of DHC in mMCAI. Primary outcomes were mortality and major disability (modified Rankin Scale score: 4–5) among survivors. Secondary outcomes were death or major disability (mRS score >3), and death or severe disability (mRS score >4). Effect sizes were expressed in Peto odds ratio (Peto OR) with 95% confidence intervals.

Results: Six studies with 314 patients were subjected to meta-analysis. Data showed that DHC, significantly decreased mortality risk, death or major disability (mRS score >3), and death or severe disability (mRS score >4); but was associated with a slightly higher proportion of major disability (mRS score: 4–5) among survivors. There were no statistically significant age differences.

* Corresponding author. Department of Neurosurgery, First Affiliated Hospital of Guangxi Medical University, 22 Shuangyong Road, Qingxiu District, Nanning City, Guangxi Zhuang Autonomous Region, China. Tel.: +86 13707882700; fax: +86 0771 5358577.

E-mail addresses: minghao.yang@outlook.com (M.-H. Yang), linhongyu1987@sina.com (H.-Y. Lin), neurosurgui@vip.163.com (S.-W. Xiao).

¹ These authors contributed equally to this work.

<http://dx.doi.org/10.1016/j.surge.2014.12.002>

1479-666X/© 2015 Royal College of Surgeons of Edinburgh (Scottish charity number SC005317) and Royal College of Surgeons in Ireland. Published by Elsevier Ltd. All rights reserved.

Conclusions: Compared to conservative treatment, DHC significantly decreased mortality and improved functional outcome, with a non-significant increase in the proportion of survivors with major disability. Further studies are required for multidimensional evaluation of DHC for mMCAI.

© 2015 Royal College of Surgeons of Edinburgh (Scottish charity number SC005317) and Royal College of Surgeons in Ireland. Published by Elsevier Ltd. All rights reserved.

Introduction

Malignant middle cerebral artery infarction (mMCAI), which accounts for up to 8% of all hospitalized ischemic stroke, is associated with a high fatality of 80%, despite intensive care-based treatment.¹ Most patients experience neurological deterioration and transtentorial herniation within 72–96 h.² For the therapy strategies, conservative medical treatment consisted of hyperventilation, mannitol, and sedation has not been supported by sufficient evidence of efficacy from clinical trials.^{3,4} Decompressive hemicraniectomy (DHC), which aims at relieving refractory intracranial hypertension and brainstem compression by removing a part of skull and opening the dura to accommodate the swelling cerebral tissue, has been studied since 1956⁵ and has become an attractive option for patients with mMCAI.

A previous meta-analysis, completed by Cruz-Flores et al.,⁶ confirmed the beneficial effects of DHC in decreasing the mortality and improving functional outcome in patients with mMCAI aged ≤ 60 years, as reported in three European randomized controlled trials (RCTs).^{7–9} Subsequently, guidelines from the American Heart Association/American Stroke Association (AHA/ASA) recommended DHC for mMCAI patients aged < 60 years with a level of evidence of I.¹ However, restricted to the limited RCTs, the efficacy of DHC in patients aged > 60 years remained unclear. Recently, three more RCTs with additional 187 patients with an age limit of up to 80 years were published.^{10–12} Whether these reports change the previous conclusions and whether patients with mMCAI aged > 60 years benefit from DHC are unclear. To address these issues, we conducted an updated meta-analysis to evaluate the effect of DHC in patients with mMCAI.

Materials and methods

Literature search and inclusion criteria

A systematic literature search of PubMed, EMBASE, and the Cochrane Library Central Register of Control Trials, was conducted by two reviewers (M–H Y and H–Y L) to identify all the relevant articles published up to June 15, 2014. The search used key terms including hemicraniectomy, decompressive craniectomy, surgical decompression, middle cerebral artery, and stroke. No language and human subject restrictions were imposed. Subsequently, we also searched and evaluated the reference lists of identified studies for other potentially

eligible trials. This process was performed iteratively until no additional articles could be identified. The following inclusive criteria were applied: (1) adult patients aged 18–80 years, with mMCAI onset within 96 h; (2) RCTs that compared DHC with conservative treatments; (3) modified Rankin Scale (mRS) scores at 12 months after randomization or treatment were explicitly reported for both DHC and control groups.

Data extraction and outcome measures

Two independent reviewers extracted trial details pertaining to the baseline characteristics of the studies and patients (first author, year of publication, number of patients, study design, Jadad score, definition of mMCAI, and patient characteristics), interventions, and relevant outcomes. Extracted data were entered into a standardized form and were checked by a third author. Any disagreements were resolved by discussion and consensus.

The primary outcomes included mortality, and major disability (defined as mRS scores: 4–5) among survivors. Secondary outcomes were death or major disability (defined as mRS scores > 3), and death or severe disability (defined as mRS scores > 4). The mRS measures the physical disability with a range from 0 (indicating no symptoms) to 6 (indicating death); for the meta-analysis, functional outcome was dichotomized 0–3 (survival without major disability) vs. 4–6 (death or major disability) or 0–4 (survival without severe disability) vs. 5–6 (deaths or severe disability). All primary and secondary outcomes were assessed at 12 months after randomization or treatment.

Quality scoring and risk of bias assessment

The methodological quality of each trial was evaluated using the Jadad scale.¹³ This scale consists of three parts describing randomization (0–2 points), blinding (0–2 points), and drop-outs and withdrawals (0–1 point) in the report of an RCT. A score of 1 was given for each of the points described. Additional point was obtained when the method of randomization and/or blinding was appropriate; where it was inappropriate, a point was deducted. The quality scale ranged from 0 to 5 points. Higher scores indicated better reporting. The studies were said to be of low quality if the Jadad score was not more than 2, and of high quality if the score was at least 3.^{13,14}

Risk-of-bias assessment was performed in accordance with the guidelines outlined in the Cochrane Handbook for Systematic Reviews of Interventions (version 5.1.0).¹⁵ Two reviewers subjectively reviewed all studies and assigned a

Download English Version:

<https://daneshyari.com/en/article/3178466>

Download Persian Version:

<https://daneshyari.com/article/3178466>

[Daneshyari.com](https://daneshyari.com)