

Guidelines for Management of Ischaemic Stroke and Transient Ischaemic Attack 2008

The European Stroke Organisation (ESO) Executive Committee and the ESO Writing Committee

Key Words

Stroke prevention · Educational measures · Stroke Unit · Imaging · Acute treatment · Rehabilitation

Abstract

This article represents the update of the European Stroke Initiative Recommendations for Stroke Management. These guidelines cover both ischaemic stroke and transient ischaemic attacks, which are now considered to be a single entity. The article covers referral and emergency management, Stroke Unit service, diagnostics, primary and secondary prevention, general stroke treatment, specific treatment including acute management, management of complications, and rehabilitation.

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Foreword

This article represents the update of the European Stroke Initiative (EUSI) Recommendations for Stroke Management, which were first published in this journal in 2000 [1, 2], and subsequently translated into a number of languages including Spanish, Portuguese, Italian, German, Greek, Turkish, Lithuanian, Polish, Russian and Mandarin Chinese. The first update of the recommendations was published in 2003 [2]. In 2006, the EUSI decided that a larger group of authors should prepare the next update. In the meantime, a new European Stroke Society, the European Stroke Organisation (ESO), was established and took over the task of updating the guidelines. Accordingly, the new recommendations have been prepared by members of both the former EUSI Recommendations Writing Committee and the ESO (see appendix). The members of the Writing Group met in Heidelberg, Germany for 3 days in December 2007 to finalize the new

The ESO Writing Committee: Peter A. Ringleb, Heidelberg, Germany; Marie-Germaine Bousser, Paris, France; Gary Ford, Newcastle, UK; Philip Bath, Nottingham, UK; Michael Brainin, Krems, Austria; Valeria Caso, Perugia, Italy; Álvaro Cervera, Barcelona, Spain; Angel Chamorro, Barcelona, Spain; Charlotte Cordonnier, Lille, France; László Csiba, Debrecen, Hungary; Antoni Davalos, Barcelona, Spain; Hans-Christoph Diener, Essen, Germany; José Ferro, Lisbon, Portugal; Werner Hacke, Heidelberg, Germany; Michael Hennerici, Mannheim, Germany; Markku Kaste, Helsinki, Finland; Peter Langhorne, Glasgow, UK; Kennedy Lees, Glasgow, UK; Didier Leys, Lille, France; Jan Lodder, Maastricht, The Netherlands;

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Werner Hacke, MD, PhD
Department of Neurology, University of Heidelberg, Im Neuenheimer Feld 400
DE-69120 Heidelberg (Germany)
Tel. +49 6221 568 210, Fax +49 6221 565 348
E-Mail werner_hacke@med.uni-heidelberg.de

smoking doubles the risk of ischaemic stroke [230]. Subjects who stop smoking reduce this risk by 50% [225]. Making workplaces smoke-free would result in considerable health and economic benefits [231].

Alcohol Consumption

Heavy alcohol drinking (>60 g/day) increases the risk of ischaemic stroke (RR 1.69; 95% CI 1.34–2.15) and haemorrhagic stroke (RR 2.18; 95% CI 1.48–3.20). In contrast, light consumption (<12 g/day) is associated with a reduction in all stroke (RR 0.83; 95% CI 0.75–0.91) and ischaemic stroke (RR 0.80; 95% CI 0.67–0.96), and moderate consumption (12–24 g/day) with a reduction in ischaemic stroke (RR 0.72; 95% CI 0.57–0.91) [232]. Red wine consumption is associated with the lowest risk in comparison with other beverages [233]. BP elevation appears to be an important intermediary in the relation between alcohol consumption and stroke [234].

Physical Activity

In a meta-analysis of cohort and case-control studies, physically active individuals had a lower risk of stroke or death than those with low activity (RR 0.73; 95% CI 0.67–0.79). Similarly, moderately active individuals had a lower risk of stroke, compared with those who were inactive (RR 0.80; 95% CI 0.74–0.86) [235]. This association is mediated, in part, through beneficial effects on body weight, BP, serum cholesterol, and glucose tolerance. Leisure-based physical activity (2–5 h per week) has been independently associated with a reduced severity of ischaemic stroke at admission and better short-term outcome [236].

Diet

Fruit, Vegetable, and Fish Intake

In observational studies, high fruit and vegetable intake was associated with a decreased risk of stroke, compared with lower intake (RR 0.96 for each increment of 2 servings/day; 95% CI 0.93–1.00) [237]. The risk of ischaemic stroke was lower in people who consumed fish at least once per month (RR 0.69; 95% CI 0.48–0.99) [238]. Whole grain intake was associated with a reduction in CV disease (OR 0.79; 95% CI 0.73–0.85) but not stroke [239]. Dietary calcium intake from dairy products was associated with lower mortality from stroke in a Japanese population [240]. However, in a further study there was no interaction between the intake of total fat or cholesterol, and stroke risk in men [241].

In a randomized controlled trial in women, dietary interventions did not reduce the incidence of coronary

events and stroke despite there being an 8.2% reduction of total fat intake and an increased consumption of vegetables, fruits and grains [242].

Body Weight

A high body mass index (≥ 25) is associated with an increased risk of stroke in men [243] and women [244], mainly mediated by concomitant arterial hypertension and diabetes. Abdominal adiposity is a risk factor for stroke in men but not women [245]. Although weight loss reduces BP [246], it does not lower stroke risk [247].

Vitamins

A low intake of vitamin D is associated with an increased risk of stroke [248], but supplements of calcium plus vitamin D do not reduce the risk of stroke [249]. Supplements of tocopherol and beta carotene do not reduce stroke [250]. A meta-analysis of trials with vitamin E supplementation found that it might increase mortality when used at high doses (≥ 400 IU/day) [251].

High homocysteine levels are associated with increased stroke risk (OR 1.19; 95% CI 1.05–1.31) [252]. Since folic acid fortification of enriched grain products was mandated by the US Food and Drug Administration, there has been a reduction in stroke mortality rates, in contrast to countries without fortification [253]. **A meta-analysis concluded that folic acid supplementation can reduce the risk of stroke (RR 0.82; 95% CI 0.68–1.00) [254];** the benefit was greatest in trials with long treatment durations or larger homocysteine-lowering effects, and in countries where grain was not fortified.

Postmenopausal Oestrogen Replacement Therapy

Stroke rates rise rapidly in women after the menopause. However, in an analysis based on a 16-year follow-up of 59,337 postmenopausal women participating in the Nurses' Health Study, there was only a weak association between stroke and oestrogen replacement [255]. According to the HERS II trial, hormone replacement in healthy women is associated with an increased risk of ischaemic stroke [256]. A Cochrane systematic review [257] found hormone replacement therapy to be associated with an increased risk of stroke (RR 1.44; 95% CI 1.10–1.89). A secondary analysis of the Women's Health Initiative randomized controlled trial suggests that the risk of stroke is increased with hormone replacement therapy only in women with prolonged hormone use (>5 years; RR 1.32; 95% CI 1.12–1.56) [258, 259].

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