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WHAT'S NEW IN RELATION TO STROKE?

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SUMMARY

Introduction: *A cerebrovascular event is a pathology that affects brain tissue by an interruption of blood flow, which may result in irreversible injury. If there is spontaneous recovery of symptoms and no brain damage, it is called a transient ischaemic attack. Early diagnosis and treatment can reduce the likelihood of sequelae in stroke patients (1).*

Aim: *The aim is to mention therapeutic novelties, both pharmacological and non-pharmacological, about stroke management, based on review articles and original articles from 2017 to the present.*

Methodology: *This review was conducted by searching for information in Cochrane Library, Google Scholar, Science Direct and PubMed. The documents found were in Spanish and English. Some articles were excluded due to lack of relevance and not corresponding to the time needed.*

Results: *For the initial approach to stroke, we have: acetylsalicylic acid, clopidogrel, statins and initiate thrombolysis or thrombectomy as soon as possible. Therapies such as carotid endarterectomy are vital to avoid recurrences. For the rehabilitation of patients with sequelae we have: speech and language therapy, mental practice, electromechanical trainings, mirror therapies, and above all the improvement of health services.*

Conclusions: *Strokes need to be diagnosed early. Computed tomography or magnetic resonance imaging can help in diagnosis. There are pharmacological and non-pharmacological therapeutic alternatives. Pharmacological therapies are used in acute phases of stroke, while non-pharmacological therapies are more directed towards rehabilitation therapies.*

KEYWORDS: *Stroke, Thrombolytic Therapy, Endarterectomy, Stroke Rehabilitation, Transient Ischaemic Attack.*

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ABSTRACT

Introduction: *Stroke, also called cerebrovascular event, is a pathology affecting brain tissue caused by an interruption of blood flow in an area of the brain, which may produce an irreversible lesion. If there is spontaneous recovery of symptoms and there is no brain injury due to ischemia, it is called a transient ischemic attack. In general, if the diagnosis (symptomatology and simple cranial tomography) and early treatment are reached, the probability of sequelae in the patient with stroke can be reduced (27).*

Objective: *The aim of this review is to mention therapeutic updates, both pharmacological and non-pharmacological, about stroke management, based on review articles and original articles from 2017 to present.*

Methodology: *This review was carried out by searching the Cochrane Library, Google Scholar, ScienceDirect and Pubmed databases. The documents found were in Spanish and English. Some articles were excluded due to lack of importance for our review and because they did not correspond to the proposed time of analysis (2017 - 2022).*

Results: *The drugs most commonly recommended in the initial approach to patients with suspected stroke are: acetylsalicylic acid, clopidogrel, statins and initiating thrombolysis or thrombectomy as soon as possible. Therapies based on endarterectomy are vital to avoid recurrences. Some non-pharmacological therapies that have been implemented in the rehabilitation of patients with motor sequelae of stroke are: speech and language therapy, mental practice, electromechanical training, mirror therapies, and above all the improvement of health services.*

Conclusions: *Strokes have a symptomatology and manifestations that it is important to diagnose early. Diagnostic imaging such as CT or MRI can help in the diagnosis. Several therapeutic alternatives are currently available, both pharmacological and non-pharmacological. Pharmacological therapies are used in the acute phases of stroke, while non-pharmacological therapies are aimed more at rehabilitation therapies for possible sequelae.*

KEY WORDS: *Stroke, Thrombolytic Therapy, Endarterectomy, Stroke Rehabilitation, Transient Ischemic Attack.*

INTRODUCTION

Patients between 70 and 79 years of age are mostly those who have a predominance of stroke; this is due to increased dyslipidaemia, endothelial dysfunction. In addition to this, the presence of arterial hypertension (the most important risk factor) and hypertriglyceridaemia, smoking, together with patients with diabetes are other important risk factors, which increase the probability of suffering a stroke by 2 to 4 times. In relation to diabetes, patients are more likely to have recurrences. It has been shown that the presence of a prolonged corrected QT on the electrocardiogram is a strong predictor of mortality in these patients because it generates an autonomic alteration at the cardiac level, which leads to an elevated risk of death (2). The activation of the stroke code is a fundamental part of the initial management of these patients. The most important element to consider is the time before arrival at the emergency department (3).

The symptoms of stroke patients depend on the area where the flow reduction is generated, ranging from aphasia, hypoaesthesia and paresis in middle cerebral artery involvement, to amaurosis fugax, homonymous contralateral hemianopsia in posterior cerebral artery involvement. In case of basilar vertebral involvement, it usually presents with bilateral sensory or motor dysfunction, total or partial loss of vision. After evaluation of symptoms and suspicion of stroke, vital signs are assessed and laboratory samples and imaging tests (simple cranial tomography or magnetic resonance imaging) are taken. All patients have a window period of 4.5 hours for thrombolysis and up to 6 hours for mechanical thrombectomy. The treatment of stroke depends on whether it is ischaemic or haemorrhagic; if it is ischaemic, a tissue plasminogen activator must be administered, which dissolves the clot that generates the pathology. A haemorrhagic stroke must always be completely ruled out if tissue plasminogen activator is to be administered. In a haemorrhagic stroke, the first thing to be done is to lower the blood pressure (the first cause of haemorrhagic stroke). In some cases, drainage of the blood by brain surgery is required. In the case of aneurysm rupture, aneurysm clipping surgery or endovascular coiling is performed (4).

METHODOLOGY

This literature review was prepared based on the selection of 66 review articles and original articles taken from various databases and journals, among which we have: Cochrane Library, Google Scholar, Sciencedirect, Recimundo and PubMed. After this selection of articles, 30 scientific articles were selected. The selection criteria for these reviews were the general description of this pathology, the different novelties in relation to current procedures and therapies for the treatment of stroke, together with elements different from what is usually found in the medical literature, in order to avoid this bibliographic review being different in wording and approach; and the time of the articles (2017 - 2022). The information collected served to demonstrate the different pharmacological and non-pharmacological therapeutic modalities for stroke. The exclusion criteria were instead the time of publication of the reviews (prior to 2017), and the repetition of some scientific articles related to common and basic concepts; since, in this literature review, we tried to focus on not so well known novelties in relation to cerebrovascular events. The aim of this review and the selection of these reviews was to show the ways in which therapies have advanced to the point where other elements exist for both the acute management of a cerebrovascular

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event and procedures that are useful for patients who manifest sequelae following a cerebrovascular event.

RESULTS AND DISCUSSIONS

As mentioned, there is a need for the most accurate determination of stroke patients and their possible treatment; therefore, scales are needed to determine this. Therefore, it was determined that ambulance physicians should use the Cincinnati Prehospital Stroke Scale (CISS) for its high sensitivity, although the Recognition Of Stroke In The Emergency Room (ROSIER) or the Melbourne Ambulance Stroke Scale (MASS) scales can also be used for their higher specificity. In emergency rooms, the ROSIER scale is preferred, as it has been shown to be more effective than the FAST (FACE, ARM, SPEECH, TIME) scale (5).

Pharmacological Interventions

Administration of anticoagulants decreased the likelihood of recurrent stroke, pulmonary embolism or deep vein thrombosis; however, it increases the risk of bleeding (6)(7). The same effect could be observed with the use of antiplatelet drugs; the use of 2 antiplatelet drugs prevents early stroke recurrence, but increases the risk of side effects, especially bleeding. However, the benefits of 2 antiplatelet agents given after a cerebrovascular event outweigh the risks after the first month (8).

It is true that recanalisation therapy (either with thrombolysis or thrombectomy) in stroke patients is one of the preferred techniques to improve functional prognosis and, above all, survival. However, cerebral haemorrhage has to be considered as a possible adverse effect. Therefore, it is of vital importance to be able to thoroughly analyse the patient's suitability to proceed with this therapy (9). On this basis, endovascular thrombectomy is recommended because of the increased likelihood of functional survival of the patient, with the reduced possibility of cerebral haemorrhage (10)(11).

One of the interventions that should be performed is carotid endarterectomy to prevent future cerebrovascular events, although this procedure is not without risk. Nevertheless, carotid endarterectomy has been found to decrease the risk of a new stroke in patients with significant stenosis; this is evidenced by the benefit to patients with symptomatic stenosis of 50-69%; and it is very beneficial for patients with stenosis of 70-99% (12).

Another important element in terms of medication that can be administered to stroke patients is antiplatelet agents, such as aspirin. A dose of 160-300 milligrams of acetylsalicylic acid is recommended within 48 hours of stroke symptoms; this results in reduced mortality and reduced risk of stroke recurrence within 2 weeks (13). In contrast, the administration of clopidogrel and acetylsalicylic acid to patients with cardiovascular disease was shown to be associated with a decreased risk of cerebral vascular events; however, this association was shown to result in an increased likelihood of haemorrhage (14). Shifting to the analysis of another drug, it was found in 10 trials of a total of 4281 patients with acute ischaemic stroke that administration of Citicoline had no benefit or influence on disability, functional or neurological recovery (15). In patients with hypertension who have had a stroke, a considerable benefit has been established for the administration of antihypertensives to prevent the likelihood of a new cerebrovascular event or transient ischaemic attack (although the evidence is more directed to studies with ACE inhibitors or a diuretic) when administered at least 48 hours after a cerebral vascular event or transient ischaemic attack (16). Following this perspective, it has also been shown that the use of statins to keep LDL below 70 (especially in patients with cardiovascular disease), reduces the likelihood of a cerebral vascular event by approximately 28-31% and of a new stroke by 33% (17).

There are currently several therapeutic approaches surrounding the treatment of people suffering from stroke. One of them is stem cell transplantation in ischaemic stroke; there is usually evidence that giving stem cells to patients reduces neurological deterioration, although there is no functional improvement (18).

Non-pharmacological interventions

The management of patients in specialised units for cerebral vascular events (also called organised inpatient care) has been shown to produce greater benefits in stroke patients, especially in reducing the sequelae and maintaining a good quality of life in patients, regardless of severity, gender or even age of the patient (19). Speech and language therapy is vital and very important to treat patients with aphasia as a sequelae of stroke. High-intensity therapy has been shown to help patients in everyday life and improve aphasia (20). Within this same aspect, mental practice (repetitive mental rehearsal of an action without physically performing it) has been shown to be beneficial in post-stroke hemiparesis patients in improving upper limb mobility and functionality, along with other physical rehabilitation therapies (21). In addition, patients who receive electromechanical training (shoulder, elbow or hand rehabilitation aids) improve activities of daily living, muscle strength and functionality of the affected limb (22). In relation to gait, several elements and devices have been developed for this purpose. The use of electromechanical gait training devices, combined with physiotherapy, increases walking speed, allowing the patient to walk autonomously (especially in the first 3 months) (23).

Apart from this rehabilitation therapy, one has to mention mirror therapy, where a mirror is placed between the patient's arms and legs; this mirror covers the affected limbs and reflects the actions of the unaffected limbs. This therapy helps the movement of the affected limbs, pain and motor deficits; all these effects were maintained for 6 months (24). Motor imagery (imagining movement of the affected limb without actually moving it) has been used for relearning movement; however, there is so far no sustainable evidence to support the use of this rehabilitation therapy (25). In addition, all patients who have suffered a cerebral vascular event should be recommended to undergo cardiorespiratory training, such as walking and strength exercises, to improve fitness, balance and walking ability. In addition, this has been shown to decrease hospitalisation for cerebral vascular accidents by up to 7% (26). In parity with this condition, occupational therapy has been found to slightly improve cognitive performance and sustained visual attention, along with thinking and working

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memory (27). Another therapy that is practised in this type of patient is circuit training. This group therapy is based on specific practices and tasks. This therapy has been shown to improve walking ability, with greater autonomy, and to improve balance (28). A separate form that has been studied is constraint-induced movement therapy for the upper extremities; this is characterised by preventing the unaffected arm from moving to stimulate movement of the affected limb. This technique has been shown to be beneficial in increasing the usability of the affected limb, as well as improving limb movements (29).

Apart from this, a good intervention in the health services of physicians is very important for patients with stroke sequelae, as this leads to improvements in the control of associated risk factors, such as blood pressure, glycosylated haemoglobin, lipid profile, among others (30).

CONCLUSIONS

Strokes generally have very serious sequelae that significantly compromise patients' quality of life. Therefore, the patient needs to be treated as early as possible to avoid major sequelae. This can be achieved by properly identifying patients and administering the appropriate medication or, failing that, referring them for a surgical procedure. After this, rehabilitation of the possible consequences of this pathology, whether it is language or motor activity, needs to be initiated. Therefore, there are currently some alternatives related to the improvement of the motor or language aspect of patients with sequelae caused by stroke. Although it is true that some therapies need more studies to demonstrate their effectiveness, these techniques mentioned here are routinely used.

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Data availability

Data were collected from PubMed, Cochrane and Google Scholar databases.

Conflict of interest

The authors report no conflicts of interest**.**

Consent to publication

The authors unanimously approve the publication of this review in the journal.

Ethical approval and consent to participate

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