

Cerebral Vascular Accident



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Abstract

According to the World Health Organization and other leading experts in stroke, 6.2 million people die each year from stroke. An estimated 17.3 million deaths from cardiovascular disease, accounting for 30% of total global mortality. Of these deaths, an estimated 7.3 million are due to coronary heart disease and 6.2 million to a stroke (2008 statistics)

Keywords: Cardiovascular disease; Stroke; Vascular accident; Blood vessel; Epidemiology

Abbreviations: CVA: Cerebral Vascular Accident; WHO: World Health Organization; UNV: Neuro-Vascular Unit; HAS: High Authority of Health; NSU: Unilateral Spatial Neglect; Cerebro-injured Rights

Introduction

First, we define and situate the Cerebral Vascular Accident (CVA) blessing to its epidemiology in order to properly evaluate the importance of this pathology. These reminders then lead us to list the most frequent sequelae generated by a stroke.

Definition

Stroke is the most common neurological disease in industrialized countries. In popular language, it is also frequently called "attack", "cerebral congestion", "apoplexy". It is defined by the World Health Organization (WHO) as "the rapid development of localized or global clinical signs of cerebral dysfunction with symptoms lasting longer than 24 hours, leading to death with no other apparent cause than the" a vascular origin ". The International Classification of Diseases defines it as "a sharp deficit of focal cerebral function with no apparent cause other than a vascular cause". These definitions are nevertheless rather vague because they group cerebral lesions with very different pathophysiological mechanisms and therefore different consequences and prognoses.

Stroke is a medical emergency: obstruction of a blood vessel or rupture of its walls interrupts the flow of blood flow and threatens the brain structures located downstream of the stroke. The severity of the stroke depends on the extent of the lesion and its location. 20-30% of patients die within the first few months of the stroke (Recommendations of the High Authority of Health, 2009); the risk is maximal in the first days or weeks and then decreases rapidly.

The diagnosis of stroke is based on data from the interview of the patient and the entourage, as well as on the clinical criteria

but must be confirmed by the brain imaging (CT scan and I.R.M.). The latter will make it possible to determine the injured area but especially its nature, ischemic or haemorrhagic. Etiologic diagnosis is a fundamental step in the immediate management and prevention of relapses.

The medical management of the cerebrovascular accident is therefore multiple. It includes primary prevention of cardiovascular risk factors (hypertension, hypercholesterolemia, smoking, diabetes, etc.) as well as the early management of the stroke patient in a specialized Neuro-Vascular Unit (UNV) (where possible). Emergency care and treatment within three hours of stroke increase the chances of survival and limit potential sequelae. Monitoring also includes secondary prevention of the risk of recidivism. Often, paramedical care is also necessary in order to restore injured functions or to allow the patient to rehabilitate him / herself in this new state.

Epidemiology

Because of their frequency, the severity of their sequelae, their mortality and their risk of recurrence, stroke is a public health priority at this time. The second leading cause of dementia after Alzheimer's disease (30% of dementias is entirely or partly due to stroke) and the third leading cause of death (after heart disease and cancer). A stroke occurs every four minutes in France, every five seconds in the world, according to the World Health Organization (WHO). In France, the annual incidence is 100 000 to 145 000 AVC per year, which makes it a frequent pathology.

The number of deaths at the end of the first month is estimated at 15 to 20% and the number of patients surviving

with sequelae is 75%. The High Authority of Health (HAS) also indicates that 30,000 patients have severe sequelae at 1 year of the accident. Stroke is therefore pathology with consequences. Stroke is a recurrent disease. The risk of recurrence of stroke at 5 years is estimated between 30 and 43%. This emphasizes the importance of preventive action.

It is important to add that the socio-economic cost of stroke is very high and strongly related to the importance of neurological sequelae. Stroke has significant financial implications. Moreover, given the ever-increasing life expectancy, stroke represents a real human scourge. The associated morbidity, which is often very cumbersome, causes a real upheaval in the lives of affected patients and families.

Sémiologie

The sequelae of stroke vary depending on the mechanism (ischemia or hemorrhage), the location, extent of injury, and previous health status of the patient. They are generally of maximum intensity at the beginning and then will regress or be compensated thanks to the various treatments therapeutic.

We can distinguish some of the usual and lasting consequences of stroke. The patient may suffer from one or more disorders:

- a) Motor performance disorders: muscle weakness (hemiparesis) or paralysis (hemiplegia) on the contralateral side to the lesion. The latter may touch a whole-body part but most often concerns the upper limb, the lower limb or the face.
- b) Disorders of the sensibility: a loss or difficulties of sensibility which are manifested by numbness, even anesthesia of a part of the body.
- c) Disorders of balance or coordination of movement of the limbs visual disturbances: loss of vision on one half of the visual field, identical for eyes (hemianopsia), double vision (diplopia) or loss of vision of one eye (amaurosis). Speech and language disorders: difficulties in articulation (dysarthria), disorders of expression and/or understanding of oral and/or written language (aphasia), disorders of prosody, pragmatic disorders...
- d) Attention disorders: disturbances of spatial attention (unilateral spatial neglect), sustained attention, divided attention or even disturbance of selective attention.
- e) Memory disorders: disorders of working memory, episodic memory...
- f) Dysecructive disorders: lack of planning, inhibition, organizational strategies and flexibility.
- g) Praxical disorders: apraxia bucco-facial, apraxia of the dressing...
- h) Gnostic disorders: anosognosia, visual agnosia...

- i) Psycho-affective disorders: depression, anxiety, apathy, aggression or social disinhibition.

The deficits caused by stroke are often similar. However, each stroke remains unique. As a result of a stroke, the risk of sequelae is high. Cognitive and psycho-behavioral disorders are expressed in a more insidious way, but they reflect, with the other neurological deficits, the alteration of the injured areas of the brain.

Cerebrovascular accident (stroke) is a common neurological disease with significant consequences. Treatment is an emergency because it can be life-threatening and an important source of disability. Dependence is generated both by physical sequelae and by neuropsychological sequelae.

Neuropsychological Retention

Stroke results in numerous sequelae, some of which are related to neuropsychology: cognitive disorders and psycho-behavioral disorders. The latter contribute to the notion of "invisible disability" and contribute to the alteration of patients' life satisfaction.

Cognitive disorders

Stroke causes cognitive impairment in the patient, which reduces the autonomy of the patient. Some disorders are little or no visible but still put the patient in a handicap. Aphasia is the primary cognitive impulse of a left stroke. It corresponds to a disorder of the oral language but also generates deficits in the writing. This disorder can occur on the expressive and / or receptive level depending on the lesion localization.

On the expressive level, it is possible to find:

- a) Phonemic disturbances: arthritic disorders, phonemic paraphasias ...
- b) Lexical perturbations: morphological paraphasias, lack of the word ...
- c) Syntactic perturbations: paragrammatism, agrammatism or dyssyntaxi.
- d) Aphasia may also manifest on the receptive side by disorders of listening comprehension including:
- e) Perturbations of the phonemic decoding: at the very level of the decoding of the phonemes,
- f) Perceptions of lexical decoding: at the level of the word,
- g) Perturbations of the syntactic comprehension: at the level of the sentence,
- h) Disruptions of discursive comprehension: at the level of the whole of a text.
- i) Speech impairments, both expressively and receptively, in oral and written form, impede communication with those around him, and thus significantly aggravate the stroke experience.

Unilateral Spatial Neglect (NSU) or heminegligence is frequently encountered in a stroke located in the right hemisphere. It refers to the inability to focus attention and initiate action in the hemi-space and the corresponding hemispace (usually the left side). The NSU can manifest itself in the visual, auditory or tactile modalities and arise in the absence of sensory deficiency or elementary motor. On a daily basis, the patient can eat only the right half of his plate or shave only the right side of the face.

In the case of hemi-negligence, it is also possible to observe praxic disorders (such as apraxia of dressing) and gnostic disorders (hemiasomatognosia, for example) in the cerebro-injured patient. In certain subjects Cerebro-injured Rights (CLD), disorders of verbal communication appear after the accident. They can affect four components: prosody, semantic word processing, discursive skills and pragmatic abilities present both expressively and receptively. Prosody corresponds to all the suprasegmental treatments that make it possible to understand speech. These include variations in intonation, pauses and differences in vocal intensity: that is, the melody that accompanies words.

The problem of the semantic treatment of words is a difficulty for the CLD to access the meaning of some infrequent words and whose references are unrecognizable and hardly imaginable. Disorder interferes with the communication skills of the CLD. It may manifest itself in a lack of respect for the coherence of discourse (digression, *coq-a-l'âne* or lack of relationship), a decrease in informative content, and difficulties in making certain inferences.

Finally, the problem of pragmatic skills impairs the difficulty of dealing with communication intentions by reference to a given context: disturbance in the appreciation of humor and sarcasm, disturbance in the treatment of indirect acts of language, and the difficulty of taking into account common shared knowledge.

Dysarthria may also occur as a result of brain damage. It denotes a speech disorder due to a dysfunction of the muscular control of the respiratory mechanics and of the various organs involved in phonation. The result is a disorder of the motility of the phonatory organs which may lead to weakness, slowness or incoordination. It causes articulatory, phonatory, respiratory and prosodic disorders. Memory disorders are a common complaint following stroke.

Memory disorders are observed when a cerebral region involved in the functioning of memory (Papez circuit) has been reached. These disorders are not always observed during the first few days of the stroke, especially if they are discrete or if other deficits conceal them, and because they sometimes have to wait until they return home to realize it. However, they can cause significant discomfort in everyday life: the person can forget what they have done the day before, forget to go to an appointment or lose the thread of a conversation.

Attentional disorders are distinguished from memory disorders. Nevertheless, they have a possible repercussion

on working memory, a short-term memory system that keeps information and manipulates it. Attention is the condition of adaptation to new situations and is necessary in the resolution of complex tasks. Attentional resources are physiologically limited and influenced by many factors such as age, overall health, psychological factors, sensory disturbances or medications.

On a daily basis, these sequelae are manifested by difficulties in concentrating for a long time on an activity, a strong distraction by external noises or an inability to perform two things at the same time. In connection with the attentional abilities, it is common to encounter in these patients dysexecutive disorders especially in frontal lesions. They lead to difficulties in planning, difficulties in self-control, a disturbance of flexibility (difficulty in passing from one action and/or idea to another), a lack of initiation (slowness to initiate spontaneously an action) or inhibition of the action. These so-called executive functions are essential in everyday life, they intervene in goal-oriented behavior and in non-routine activities. They thus create difficulties in managing new, conflicting and complex situations and in adapting behavior. They can be manifested, for example, by difficulties in planning an activity, adapting to an unexpected situation or making choices. Repeated cerebrovascular accidents can lead to vascular dementia. It is characterized by a sudden evolution marked by the appearance of multiple cognitive deficits including notably an alteration of the memory as well as a dysexecutive syndrome.

In conclusion, brain-damaged patients can suffer from many cognitive disorders that hinder their ability and make them dependent on their daily lives. All the disorders presented are not found in all patients. Nevertheless, it is not uncommon for certain cognitive disorders to be observed together. In addition, they often associate with psychological disorders.

Psychological disorders

The psychological, behavioral and affective disorders observed following stroke are associated with the cognitive disorders seen previously and help to reduce the autonomy of the patient. They can add to the care and daily care.

All the symptoms mentioned here are not of neurological origin. However, they may all be present in post-stroke, either for neurobiological reasons of lesion origin or for psychological reasons due to the consequences of the stroke. Different psychological disorders are to be distinguished: disorders of mood, behavior, ideation and family and social interactions.

Mood Disorders

Mood disorders, sometimes also called affective disorders, modify "the emotional coloring with which the cerebro-injured person perceives the world". Depression affects 30-50% of patients in the first year after stroke. It is the emotional disorder most often associated with it. It is due to the disability that follows the accident but also to the brain lesions themselves and is therefore to be distinguished from a classic depression called functional.

Indeed, although the diagnostic criteria are often similar, it differs in some respects: stroke patients show signs of more severe cognitive deterioration, greater fluctuations in mood, greater psychomotor retardation, more marked anxiety and more somatic and vegetative symptoms.

However, they are less likely to exhibit an anhedonia (inability to feel positive emotions) or a melancholy state, less guilt and fewer suicidal thoughts. Post-stroke depression has significant consequences. Indeed, it increases disability, disability and disability, requiring early detection and appropriate treatment.

Anxiety is an emotional state characterized by an excessive and persistent preoccupation that associates with fatigue, irritable mood, sleep disorders and disrupts the activities of everyday life or social functioning. This malaise is a common problem amongst stroke victims, especially in the case of the right cerebro-lesion. Between 25% and 50% of patients experience generalized anxiety in the first few months following a stroke (with or without depression), with prevalence decreasing only slightly after 2-3 years. Post-stroke anxiety, like depression, can obviously be linked to psychological factors: the preoccupation with not being able to control its reactions (motor, perceptive, cognitive, emotional) is particularly frequent in the discourse of patients in of a stroke.

Behavioral disorders

In stroke patients, it is common to notice considerable fatigability, both physical and cognitive. This sequel is at the crossroads of the previous ones. Indeed, it has consequences on motor abilities but also on the behavior and cognitive abilities of the patient. It can also, at times, increase the present disorders. Re-learning in a different way from gestures that had previously been mastered requires a lot of energy. According to the literature, the prevalence of fatigue following a stroke is between 39 and 72%. Apathy should not be seen as a manifestation of the depression of the cerebro-injured person but as a differential diagnosis of it. It constitutes a full-blown disorder with an estimated frequency of between 20 and 25% following a stroke. It corresponds to a reduction of the motivation verbal or motor and a reduction of the capacity to initiate actions against a background of emotional indifference. It manifests itself in the patient through lack of energy, lack of motivation and initiative, and lack of interest in new experiences and others. It may occur in isolation but is frequently associated with depression and cognitive impairment.

Aggressiveness and / or anger are sometimes seen in cerebro-injured patients. Less tolerant of frustration, they can become more irritable than before. Aggression may occur verbally and/or physically. Their new state is indeed source of many frustrations and the control of the emotions may lack them. 32% of patients would have difficulty inhibiting their anger. It is then the people of the immediate entourage who become the victims.

Certain factors may predispose patients with stroke to demonstrate this behavior: young age, depressive symptoms,

cognitive impairment and localization of the lesion in the anterior regions of the left hemisphere. The cerebrovascular patient may also, after stroke, laugh or cry inappropriately in a given situation. He suffers from emotional lability: he has difficulty controlling his emotions, the manifestations of which can increase in frequency, trigger for no apparent reason and escape the control normally possible in a social context. This disorder is due to the instability of the processes of inhibition and emotional control related to the lesion.

The risk of having emotional control disorders could be increased by factors such as ischemic stroke, female gender, severe motor impairment and cognitive dysfunction. Finally, it is sometimes possible that the cerebro-injured patient does not consider the usual social conventions. He then suffers from social disinhibition. Following the stroke, the brain-damaged person may behave inappropriately or transgress social norms, for example, by dealing with unknown persons. This attitude must be explained in order not to cause significant inconvenience to the entourage

The disorders of ideation

Anosognosia is the inability to recognize or appreciate the presence or severity of neurological deficits, affective disorders or cognitive dysfunctions. This disorder is linked to a neurological mechanism.

The patient does not have the cognitive capacity to take into account his deficits, and this disorder, which constitutes a major obstacle to rehabilitation, should not be neglected. It is to be distinguished from denial, which corresponds to a mechanism of psychological defense. The patient then refuses to consider his deficiencies which are intolerable to him. It rejects or inhibits reality. The work of mourning cannot be done; it is called "pathological mourning". This work on oneself consists in accepting the handicap: to mourn a previous state with old capacities and to invest again in the future. The cerebral injured person must, through various cognitive-emotional processes, adapt, cope with his new abilities and disabilities and accept his loss of autonomy.

Anosodiaphoria is defined as a state in which the patient recognizes his or her condition but cannot measure the consequences. The patient may verbally declare that he is aware of his disabilities but that he wants to accomplish a task related to this difficulty. The entourage can also be subject to a form of egocentrism: the patient goes to the basic needs and is centered on himself. He no longer has the cognitive ability to be more attentive to his loved ones. The difficulty in perceiving a situation in a global way can increase this disorder.

The disorders of ideation, in particular anosognosia, can initially prevent rehabilitation and are particularly disconcerting: they must be considered and taken care of

Disorders of family and social interactions

Disorders of familial and social interactions include a reduction of social and familial bonds. Indeed, the cerebro-person

loses his familial and social role for a time and becomes a “sick” and not a father, a lawyer or a student. The whole family allows him, in a way, to devote himself to his recovery by assigning him only passive roles. The brain-damaged subject can now feel a burden on his family, which often has to manage all the tasks that it once had. In addition, the occurrence of stroke has an impact on communication between family members. It has caused so much suffering on the part of the patient and the family that, in the face of changes and misunderstandings, conflicts between the patient and those around him increase. The patient-family system is greatly upset. His position as a social person is also altered; the cerebral person must reconstruct his identity and regain a place in society.

The difficulties of social contacts, especially among aphasic subjects, restrict the number of encounters and external relations and the brain-damaged person may experience social isolation. The patient may therefore have difficulty interacting with his family and social environment. It is important to note that the various psycho-behavioral symptoms can be related to causality with stroke when they are a significant and persistent change from the pre-morbid condition. In order to diagnose them, it is therefore essential to question relatives about the patient’s previous personality and to assess the impact of changes in daily life.

These disorders often overlap with cognitive impairment, and these changes seriously interfere with rehabilitation and reintegration programs. Indeed, associated with cognitive disorders, they constitute the notion of “invisible handicap” and participate in the alteration of life satisfaction.

Consequences of Cognitive and Psychological Disorders

An invisible handicap

Cognitive and psycho-behavioral disorders are a major source of disability. However, the disorders are not always directly visible to the entourage, except in the most severe cases. It is then important to talk about the concept of “invisible disability”. The Flammarion Medical Dictionary defines disability as a “disadvantage resulting from a disability or disability that hinders or limits the subject in the fulfillment of his social role”. It reminds us of a person who moves in a wheelchair or a blind man who walks with a white cane. However, sometimes, the handicap, although quite real, is hardly perceptible by others. It is then called invisible. People with stroke, whether in the left or right hemisphere, suffer from disorders that are often difficult to assess by professionals and those around them.

Cerebral lesions result in cognitive, behavioral and psycho-affective sequelae that diminish the person’s ability to perform certain activities of daily living and place them in situations of disability. Unlike a motor handicap, for example, this handicap is not immediately perceptible by others and by the person concerned. The cognitive, behavioral and psycho-affective sequelae are not directly visible. The person with an invisible disability often has, at first, a “normal” appearance suggesting

that he has no sequelae to his stroke. Even if one does not see them at first sight, these so-called invisible sequelae prove, in the long run, to have serious consequences in the daily life of the person and his entourage, hampering the proper realization of habits of life. In addition, behavioral sequelae are difficult to measure, using questionnaires or complex and sometimes unrecognized tests. They remain more subjective than physical or even cognitive disorders. The notion of invisibility is therefore all the more present. The character of invisibility is certainly advantages, the most notable being that those who suffer from it are less likely to be discriminated against. However, they are often exposed to the misunderstanding and judgment of others. Sneezing, the invisible handicaps can thus dramatically alter the daily lives of the people who are affected. Faced with the incomprehension of the entourage, the patient may feel the need to isolate himself and to withdraw into himself (Figure 1).

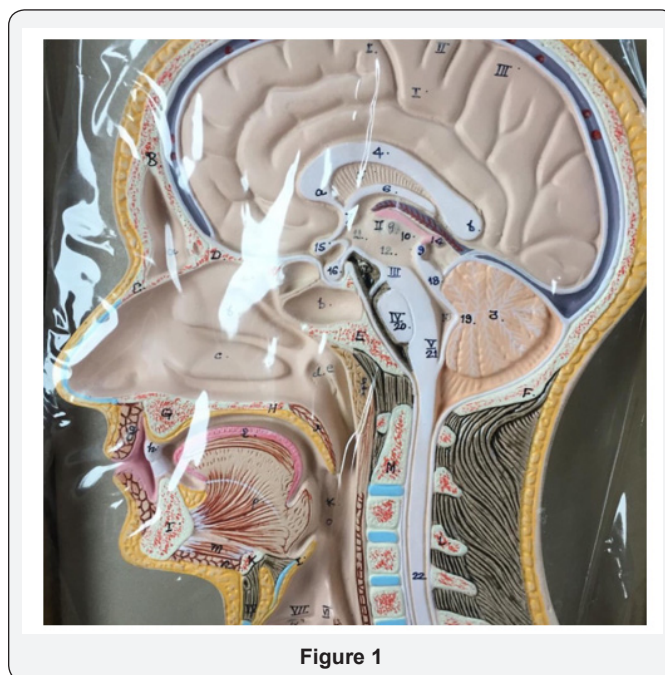


Figure 1

Most of the disabilities referred to as invisible disabilities have been experienced by the able-bodied population who have difficulty recognizing these difficulties as disorders. For example, it happens to everybody to have a memory lapse, to forget an appointment, a first name or its keys; we will not speak of a situation of disability. All these behaviors, which may seem trivial at first sight, become a real handicap if they occur at high frequency and repeat themselves over time. It was estimated that in a sample of 1000 stroke patients, the proportion of subjects with one or more cognitive stroke symptoms was 60.7%, of which 22.5% had no stroke motor disorder. It is therefore not uncommon for the patient’s most disabling disability not to be the most visible for the entourage.

Impairment of life satisfaction

Today, health is no longer “the absence of illness or infirmity” but “a state of complete physical, mental and social well-being” in the classic definition of the World Health Organization. 1948

(WHO). The notion of quality of life is conceived in relation to this new definition of health. WHO defines quality of life as “an individual’s perception of his or her place in life, in the context of the culture and the system of values in which it lives, in relation to its objectives, expectations, standards and concerns “.

Now a new concept of “life satisfaction” is developing. It refers to the quality of life perceived by the patient based on his or her own goals, expectations, norms and concerns, and not on those of today’s society. Indeed, life satisfaction is defined as “a subjective judgment, of cognitive essence, of its present living conditions, in relation to its own expectations” or as “a global assessment of the quality of life of a person according to its own criteria “.

Life satisfaction is therefore a cognitive process involving comparisons between a person’s life and his or her standards of reference (values and ideals). The importance of a subjective assessment based on personal standards of comparison, and not on standards external to the individual as imposed by researchers or theorists, is raised in this definition. Life satisfaction refers to a global judgment about one’s own life. It can be broken down into 20 more specific fields (occupation, family, leisure, health, finances, self, group of belonging, etc.). This data is indeed multidimensional. It must consider generally:

- a) The physical dimension: autonomy, physical abilities, ability to carry out tasks of everyday life or energy.
- b) The psychological dimension: emotionality, anxiety, depression, and well-being for example.

c) The social dimension: family, friendship, professional relations or participation in leisure activities.

d) The somatic dimension: manifestations of a pathology or treatments.

Other points such as diet should not be neglected. Anything that affects the life of the individual can influence the patient’s judgment about his or her life satisfaction. The latter therefore considers the perception of the subject in relation to the impact of pathology and treatment, influenced by his perceptions and expectations.

Regardless of the functions lost or altered in themselves, the important thing is to consider what they represent for the patient. The life satisfaction of cerebro-injured patients is very often altered. Desocialization is frequent 20% of hemiplegics lose social ties with friends and acquaintances. Nevertheless, the ties endure with the close family and children. It is therefore important that this data is taken into account.

It is in addition to the objective clinical evaluations and makes it possible to identify the specific needs of each patient and to deduce a therapeutic hierarchy. It is essential to consider the patient’s experience and the constraints of his environment. Cerebral vascular accident causes significant cognitive, behavioral and affective sequelae, depending on the lesion location. These sequelae, often invisible to the entourage, constitute an important handicap and greatly impair the autonomy of the patient. They contribute to reducing the satisfaction of life, by the upheavals of the daily life; weaken the balance of the family.



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