13 Cognition, emotion, and behavior

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13.1 Introduction

The rehabilitation treatment of CVA patients is intended to make them function once again in their home situation as soon as possible. Many people who have suffered a CVA, also have "invisible" disorders in addition to motor and sensory disorders. They are limited in the field of cognition, emotion and/or behavior. This can be very upsetting, for both the patient and their families. It has an influence on thinking and acting, but also on social functioning. It is important to take this into account from the start of rehabilitation. In this chapter, disorders of cognition, emotion and behavior after a CVA are discussed. In addition, we discuss the possibilities for treatment and guidance.

13.2 Cognitive disorders

A CVA often has more effects than what is observed physically, paralysis of a limb or problems with speech. The "invisible" effects often come to light later on. In the first few months after a CVA, most attention is paid to the restoration of the movement functions. This usually takes a lot of time and effort, causing other symptoms to disappear in the background.

Those affected who do not have to go to a rehabilitation center, may also have to deal with these issues. The damage to the brain can bring about changes in their thinking, actions and feelings, so that their lives will never be the same (Figure 13.1). Unfortunately, not everyone is prepared for that. Partners, children and friends are often unaware of the invisible effects they might have to deal with after a CVA.

After a CVA, people often have "elusive" issues that hinder them in day to day functioning. For example, they are always extremely tired because they cannot keep up with the pace of the world around them. This is not only due to physical disabilities. Often they do not manage to do the things they did before they had a CVA. Reading, listening to music or having a conversation can be very difficult for CVA patients. They cannot concentrate as well and are easily distracted. After a CVA, many people have trouble doing two or more things at once. Having a conversation while walking or listening to music, can be impossible for some.

Their memory can be less than desirable in terms of functioning. This goes far beyond the usual forgetfulness that develops over time. For example, some patients cannot remember things anymore, even if they are repeated several times.

Due to the loss of spatial insight, fine motor skills may now be very difficult.

In people who have had a CVA, performing activities that require different steps is usually not possible anymore. This is because they are unable to plan well and may forget things. They often want to do something but cannot think about how to achieve it.

Figure 13.1 Changes in cognition, emotion and behavior in relation to location brains. (Source: Nederlandse CVA Vereniging Samen verder)

Some CVA patients are unable to express what they want to say. This is often very frustrating, especially if they lose contact with others because of this.

Practical example

A patient cannot dress themselves well or needs a lot of time	
visible problems: - patient cannot find the opening of the sleeve - patient puts on clothes incorrectly - the patient spends a lot of time "messing around" with clothes - patient does not know the order of the garments - patient cannot find the items on his left - patient wants to put a sweater on his feet	*possible causes could be*: - patient has problems recognising objects - patient no longer knows how to use objects - patient can not properly plan, organise and order - patient has no spatial insight - patient does not check their actions

13.2.1 What are cognitive disorders?

Cognitive disorders are caused by brain injury, for example a CVA. In cognitive disorders, the patient has problems with perceiving, acting or dealing with language. Their behavior can also be changed.

In order to understand "abnormal" actions, it is important to understand how an act usually occurs.

In order to be able to perform an (apparently) simple daily operation, many steps must be taken. These steps are described in the 'process of information processing'. If there is a problem in one or more steps, the action is distorted (tab. 13.1).

13.3 Disorders in emotion and behavior

After a CVA, patients often respond to events differently than they themselves and the people around them are used to. Often times, patients tolerate less light and noise than before. Also, patients respond more violently because they are unable to control their feelings as well. Some patients are much more aggressive and start to curse at the slightest whim, which they never did so before. Others are much more passive and depressed than their family and friends are used to. Others may experience emotional responses much more quickly.

'It seems as if there is another person in that same body', you sometimes hear partners and children say. Changes in feelings and behavior also fall under the invisible effects of a CVA. In most cases, extreme reactions are a direct consequence of the damage caused by a CVA. Patients themselves are unable to do anything about it. That's important to know. Patients themselves are not always aware that they have changed. For family and friends, that may be a bitter pill to swallow. It can give them the lonely feeling that they lost someone.

For people who have had a CVA and their family, it often takes time to come to terms with these changes. The changes in emotions and behavior of the CVA patient can severely disturb the relationship with their partner and children. If others think that the patient always intentionally reacts violently, finds arguments or is passive, it will often be impossible to live together. Understanding of the invisible effects is therefore of great importance.

Even partners who have a lot of patience and understanding are not always up for the task of taking care of a patient. The balance in relationships can be completely lost or changed. This sometimes tires their partners in such a way that they themselves become ill.

13.4 Cognitive changes in the elderly

CVA is a disease that occurs frequently in older people. In addition to disorders caused by the CVA, there may be changes as a result of aging. The following aspects should therefore be taken into consideration in rehabilitation of the elderly:

- *Slower information processing*
  The process of information processing and storage of information in memory is slower when aging. Information should therefore be offered longer or more often than in young people.
- *Greater selectivity*
  Remembering new information happens more selectively. The emphasis is on impressive or relevant information.
- *Completely new information is more difficult to remember*
  It is important to match the new information with existing knowledge, because as you grow older, it can be harder to remember new information.
- *More effort*
  The ability to store information adequately is not reduced, but it takes more energy, more effort. With ageing, the amount of energy generally decreases.
- *Less attention and concentration*
  When aging, attention and concentration will decrease slightly. Concentration is required in remembering new information.
- *Smaller memory span*
  The memory span, or the instant memory and working memory, diminishes in size and length somewhat when aging.

– *Emotions in relation to cognition*
Older people can suffer anger emotions because of the greater chance of a variety of conditions, such as dementia. Reduce this fear, if possible, by giving clear information about the changing levels at the cognitive level.

Table 13.1 Process of information processing.

	Process	Disorders
1.	being alert	CVA patients are sometimes alert to a varying extent: they don't seem to be fully awake. Especially in the acute phase, this often occurs. This may also play a role in fatigue and/or certain medication use. These are disorders in the consciousness'
2.	being oriented	Not all CVA patients are well-oriented. Some patients are wrong about the time, have little sense of time or turn around day and night rhythm. Others have difficulty finding the way (back), especially in a new environment. There are also patients who no longer recognise (often new) people. This is we called 'orientation disorders''
3.	focusing, distributing and persevering	In order to act, concentration is required. Often people do - without a lot of effort - several things at once. And they do so for extended periods. For most CVA patients this is not so easy. These are 'attention disturbances'. Often patients have also become slower in their thinking. They then have 'delayed information processing'
4.	perceiving a situation	In everyday life, people perceive, hear, feel, taste and smell with their senses. Some CVA patients have a disturbed perception when it comes to senses. This is what we call 'sensory disorders'. Patients who do not seem to be aware of the affected side while not having a sensory disorder have a "hemi inattention" or a "neglect"
5.	interpreting the perceived information	The information that people "pick up" through their senses is interpreted (understood) through the brain. This is how we give meaning to what we see, hear and feel. CVA patients sometimes have difficulty detecting objects, even though they see/hear the objects. This disorder is called 'agnosia'. Being unable to perceive space and spatial relationships is called a 'spatial perception disorder'
6.	estimating own possibilities and limitations	After interpreting the situation, our own possibilities and limitations must be estimated in order to be able to act correctly and safely. Many CVA patients overestimate or underestimate their own possibilities. Many CVA patients have a 'disturbed judgment and/or disease insight '
7.	forming appropriate action plan and conducting targeted action	Action is done by performing specific sub steps in a particular order and by using objects correctly. Disorders in making or executing a plan of action are called 'apraxia'. Also, there are people who are struggling to get to an action
8.	verifying and evaluating actions	When performing an activity, we verify subconsciously whether we have completed everything well. For example, looking in the mirror

		after washing ourselves, straightening the sweater after dressing, checking that the gas stove is off after cooking and so on. If this control step is skipped, there is usually an unfinished task and sometimes chaos. Mistakes in this step often coincide with problems in attention, judgment and sometimes with an apraxia
9.	saving and generalizing experience	During the course of life, people carry out many activities. They are learning these activities while performing them and saving the learning experiences. This allows the patient to apply learned skills in other situations. Disorders in this area are called memory disorders'
10.	endurance	Healthy people can act, talk and think for a long time. They have a decent physical and mental loadability. Many CVA patients become tired more easily: not just physically but also mentally. They suffer from a limited 'capacity of information processing'. This is associated with attention disorders

13.5 Some figures about disorders in cognition, emotion and behavior

Research shows that about 80% of patients with cerebral hemorrhage and about 50% of patients with a stroke have acute cognitive impairment. After six months, 30% of CVA patients still have cognitive problems. Overall, you see a strong advance compared to the acute phase. Both the location and size of the brain damage play a major role in the degree of cognitive recovery that occurs, just as the age and (former) intelligence of the patient.

About half of the patients show depressive symptoms during the first few weeks. These depressive symptoms appear to be associated with the severity of cognitive and physical disorders, and not so much with the location of the brain injury. Often, depressive symptoms develop only a few months to a year after the CVA. It then becomes clear for the patient what the consequences of the CVA mean to him or her.

13.6 Research and treatment in disorders in cognition, emotion and behavior

Often, nurses and carers identify that something is wrong with the patient. To be able to handle patients, the problem must be clear first. Therefore, diagnostics take place. The better the carer or nurse can describe objectively how the patient is acting, the more rigorous this diagnostic can take place. An occupational therapist uses special observation tools. A psychologist can take a neuropsychological examination (NPO). The patient performs all kinds of tests for this.

The treatment of patients with cognitive impairments can focus on:

a. *Function recovery*
   By training the impaired function, we try to improve these functions (for example, memory

training). However, it has been found that this goal is difficult to achieve. Recovery of functions is often based on spontaneous recovery, in the first few weeks and months after the CVA.

b. *Strategy training* (*Internal compensation*)
   The patient learns to compensate for the impaired functions by means of his intact functions. The patient also learns to use existing or new strategies. A notion is that the patient has insight into his own functioning. Examples include that the patient himself learns to take breaks, adjust his pace or remove distractors in his environment. To make it easier to act, to forget less and to keep a better overview.
c. *Adjustment of the environment* (*External compensation*)
   If it is not possible for the patient to compensate for the disrupted functions, it may be necessary to adjust the environment to the current possibilities of the patient. People from the immediate environment can be instructed on how to apply certain principles and strategies. You can also change the physical environment, for example, by using photos, calendars, or direction indicators. If the patient is dependent on others for this purpose, we talk about external compensation.

For both *b* and *c*, the same principles are used, for example, restricting information, structuring, using a calendar. The difference is that for *b*, the patient himself uses these strategies, while for *c*, the people around him need to help.

The success of the treatment, of course, depends on the severity of the injury. In addition, actually recognising the disorders in relation to daily functioning is of importance. Clear planning and consistent implementation, treatment and guidance by all those involved increase the likelihood of success in the rehabilitation of people with these complex disorders.

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