



## MUSIC INFLUENCE IN THE RECOVERY OF THE YOUNG ADULTS AFTER STROKE-CVA(30-40 YEARS OLD)

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### Abstract

Lately, the probability of a CVA (cerebrovascular accident) suffered a considerably growth in the young population and is still growing, representing approximately a third of all cases of CVA. The reports confirm that the number of CVA among young people suffered a growth of 25% percent in the past years.

Regarding the problem of recovery of the young after CVA, the studies shown the efficacy of the music therapy. As a complementary therapy, the music is beneficial in the recovery of the motric skill that suffers a grow in speed, precision and the motion smoothness on the patients that suffered a CVA.

*Key words:* CVA, young people (30-40 years old), music therapy.

### Introduction

World Health Organization (WHO) defines the cerebrovascular accident to be "a fast development of clinical signs of disorder of the cerebral function, focused or global, that lasts for more than 24 hours (if it's not interrupted by a surgical intervention or by death) with no apparent cause, other than vascular origin" (Tunstall-Pedoe, 2003). CVA appears when a blood vessel (artery) that provides blood for a certain area of the brain is blocked by a blood clot or is broken.

CVA may be:

-hemorrhagic (caused by a bleeding inside the brain-intracerebral hemorrhage or in the space surrounding the brain-subarachnoidian hemorrhage)

-ischemic (caused by a blood clot that blocks the blood flow of the brain)

Those two types of CVA are generally speaking, classified by the nature of the disorder resulted by the depreciation of the blood flow on the brain level-circulatory insufficiency. CVA ischemic is caused by atherothrombosis or the embolism of a major cerebral artery, while the hemorrhagic CVA is associated with a broken saccular aneurysm, a vascular malformation or bleeding disorders (Adams et al, 1997; Alexander, 1997; Stedman's medical dictionary, 2000). Australian Institute of Health and Welfare (AIHW) declared that the rate of ischemic CVA is 5 times bigger than the rate of hemorrhagic CVA, but the deaths caused by hemorrhagic one is much bigger (AIHW-2004).

Each type of CVA is classified in many subcategories. One of the most accepted classifications belongs to Adams et al (1993) that splits CVA ischemic in 5 categories:

1. Atherosclerosis of a large artery
2. Cardio-embolism
3. Occlusion of a blood vessel of little importance

4. CVA caused by other strictly determined causes

5. CVA caused by other factors undetermined and unknown (Adams, Bendixen, Kappelle, Biller, Love & Gordon, 1993).

Hemorrhagic CVA can be also divided in two main categories, depending on the location of bleeding:

1. Intracerebral hemorrhage (ICH) that appears as a result of a bleeding from an arterial source directly in the brain

2. Subarachnoidian hemorrhage - when the breaking of a blood vessel is produced in the subarachnoidian space (D'Esposito, 1997; Sims & Korowhertz, 2004).

### Causes of the CVA hemorrhagic:

- a bleeding inside the brain (called intracerebral hemorrhage) or in the space surrounding the brain (subarachnoidian hemorrhage).

- bleeding inside the brain may be the result of a high blood pressure that persists over a long period of time

- the bleeding in the space surrounding the brain may be caused by the breaking of an aneurism or by the high blood pressure that hadn't been held in control

Other less frequent causes of CVA hemorrhagic are:

- the inflammation of the blood vessels, that may appear in syphilis or in tuberculosis

- blood coagulation disorders, like hemophilia

- injuries of the neck or of the head that affects the blood vessels from this region

### Causes of the ischemic CVA

The main cause is a blood clot that blocks the blood flow of the brain.

The following may be encountered:

- hardening of the artery walls (atherosclerosis). This

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is caused by the high blood pressure, diabetes and the increased level of blood cholesterol

- arterial fibrillation or other heart arrhythmias (irregular heart rhythms)
- certain diseases of the heart valves, such as an artificial heart valve, a cardiac valve repaired, mitral valve prolapse or orifice valvular stenosis
- infection of the heart valves (endocarditis)
- blood coagulation disorders
- inflammation of the blood vessels (vasculitis)
- myocardial infarction

Less often, low blood pressure can cause a ischemic cerebrovascular accident.

**Features:**

Brain attacks that occur in the left half of the brain affect the right half of the body and vice-versa. People who have dominant left hemisphere and suffers a stroke in this area, develop the language and speech deficits. Accidents of this kind in the right area of the brain affects the spatial perception and can make to deny patients the disease, to neglect the affected area of the body or to have an impulsive behavior.

- Weakness of a body part (left or right): problems at work, catching objects or other tasks. After the CVA, it highlights some aspects of motor dysfunction which are obvious on upper and lower limbs and severely limiting the motor control. The most frequent motor dysfunction, obvious at the lower limbs is hemiparesis, it is representing about two-thirds of all deficiencies encountered in the case of CVA (Mohr, Foulkes, & Polis, 1993).

- Painful and rigid joints.
- Spasticity or muscle stiffness.
- Problems with the sense of touch and the ability to differentiate the sensations of hot and cold.
- Incapacity of representing the position of different body parts.

- Inability to perform intentional motions (Kane & Buckley, 2004).

- Pain, numbness or tingling in the extremities.
- Problems with walking and in coordinating the various movements of the body.
- Problems to swallow and chew (dysphagia).
- Urinary Incontinence
- Speech problems/pronunciation (aphasia)-

when the STROKE is left side of the brain. They may not understand written or spoken language, they can't write or read, or cannot express their own thoughts.

- Cognition or memory Problems: can't apprehend, can't concentrate, can't remember, can't learn new activities.

- Problems of perception: they can't appreciate distances, shape, size, position, different body parts or whole body, they can't feel their extremities

- Vision problems.
- Emotional problems: fear, anxiety, anger, sadness, anger, frustration, depression.

The ability or inability of a person to recover after a STROKE depends on:

- which part of the brain was affected (dependent on the dominant side of each)
- How much of the brain was affected by STROKE
- The general health of the patient, before the STROKE

The rate of stroke among young and middle-aged people worldwide is increasing, currently representing nearly a third of all strokes. An analysis of data collected between 1990 and 2010, found that the number of strokes among people between the ages of 20 and 64 increased by 25 percent during this period, and that this age group now represents 31 percent of the total number of strokes, compared to 25 percent before 1990. It is expected that, in the absence of preventive measures implemented quickly, the rate of occurrence of STROKE in young and middle-aged people from around the world will increase (Valery Feigin, director of the National Institute of Neuroscience and applied to the STROKE of the University of New Zealand AUT)

On the adults, the majority of the strokes are ischemic (caused by a blood clot that blocks the blood flow of the brain). Only in 20% of cases are hemorrhagic CVA. Though, hemorrhagic CVA type is the most common cause of CVA among the young adults. Studies estimate that about 40-50% of the CVA among the young adults are hemorrhagic (stroke.org.uk, STROKE Association-April 2012)

What leads to the appearance of CVA to young? All the causes that lead to the appearance of the STROKE on adults may also occur in young people. Certain risk factors, such as atherosclerosis is less likely to occur in young people. However, there are certain risk factors that tend to affect young people in particular. These would be the following:

- High blood pressure: Although this is the most common cause while you age, high blood pressure can affect the young too. It's the most dangerous risk factor encountered in STROKE, both the young and the elderly. About 30% of population below 50 years that had a Stroke has high blood pressure too (stroke.org.uk, Stroke Association-April 2012)
- Diabetes: is a condition in which the body is not able to process glucose. This leads to the appearance of large amounts of sugar in the blood. Some studies show that diabetes is put on the second place after the high blood pressure in the context of the risk factors in the production of CVA among young people.
- Dissection: sometimes blood can penetrate the layers of the walls of the arteries and may further result in the formation of a clot in the artery or blood to enter the brain. This



- phenomenon is called dissection and sometimes occurs without a reason, but can also be the result of a lesion (stroke.org.uk, Stroke Association-April 2012).
- Problems of the blood vessels: in general, hemorrhage are often the result of a weakness of a part of the vascular system. For example, a weakness of the wall of an artery may lead to bloating it out-this is called an aneurysm. The aneurysm may burst, leaving blood to leak into the brain. Untreated, the increased tension could lead to aneurysms, because it weakens the walls of the arteries. In rare cases, people are born with the fess of blood vessels in the brain. These are called arteriovenous malformations (AVMs), because they include the arteries and veins. If AVMs, blood vessels are fragile and may break, causing bleeding (stroke.org.uk, Stroke Association-April 2012).
  - Heart diseases: there are many heart conditions that may increase the risk of STROKE. The most important of them is atrial fibrillation (AF) that the irregular heart beat. In the case of AF, the heart does not pump blood as they would under normal circumstances. AF can cause blood clots that can travel to the brain, causing STROKE (the Stroke Association-stroke.org.uk April 2012)
  - Another frequent disease among young people is the interatrial septum defect (ISD), which is a hole in the wall separating the two atria of the heart. To most people it closes immediately after birth, but about one-third of the population it remains open. In people under 55 years of DSI is associated with a significant increase in the risk of ischemic stroke production, although it is not entirely clear how, through what mechanisms lead to DSI this growth.
  - Ethnic Background: those in South Asia and the Caribbean-African population poses the greatest risk to make a CVA. The Caribbean-Africa in particular, tend to have a first STROKE in his youth, compared to those in the UK. This may be caused by genetic disposition. Certain conditions that increase the risk of stroke, such as high blood pressure, and diabetes are more common in these ethnic groups.
  - Migraine: recent studies have confirmed that migraine with Visual aura (disturbance of vision) is a predisposing risk factor for the occurrence of STROKE in women between the ages of 15 and 45 years. Smoking and the use of oral contraceptives lead to increase this risk (stroke.org.uk, Stroke Association-April 2012)
  - Atherosclerosis:represents fat deposition on artery walls. It is a common risk factor in older adults, but the young below 35 years has only a minor role in the occurrence of STROKE. The risk of STROKE due to atherosclerosis presents an increase of between 30 and 45 years.
  - Other factors:Many other factors can cause Stroke.Those other factors may be responsible for 26% of the strokes among the young adults.We will present you those less frequent causes:
    - Problems of blood clotting, which can lead to the formation of blood clots in the small vessels of the brain.
    - Hughes syndrome or antiphospholipid Syndrome, occurs when the immune system attacks the fats and proteins in the blood, thus leading to modification of its consistency. This can lead to the formation of clots in the arteries of the brain. Hughes ' syndrome is believed to be responsible for 20 per cent of STROKE occurring in people aged under 45 years of age.
    - Certain rare genetic diseases can develop the risk of STROKE. For example, Fabry disease affects metabolism, leading to an accumulation of fat in the cells of the blood vessels or anywhere else in the body (stroke.org.uk, Stroke Association-April 2012).
    - Lifestyle Factors:
      - Smoking: doubles the risk of STROKE due to the fact that smokers are more prone to blood clots and narrowing of the arteries, which leads to blockage of blood vessels.
      - Alcohol: alcohol consumption over long periods of time and excessive can increase blood pressure. Execiv consumption is ingesting more than 8 units once in males or more than 6 women. There is an association between consumption of recently (especially excessive) and ischemic stroke in those 16-40 years and who have no other known risk factors.
      - Drugs: drug use increases the chances of developing AVC with 6.5. It has been estimated that 14 per cent of AVC at those aged between 18 and 44 years are caused by the consumption of drugs, including ecstasy (MDMA), cannabis and stimulants, such as cocaine and amphetamines. There are several possible reasons for this, but a sharp rise in blood pressure due to the stimulus is likely to be a key cause of hemorrhagic STROKE especially in people with aneurysms or AVMs.
      - The diets and exercise: Healthy Diet lowers the risk of having a stroke. In particular, a diet that is rich in fruits, vegetables, whole grains, fiber and potassium may protect against STROKE. Also, avoid excessive consumption



of salt and saturated fats may reduce this risk. Regular exercise can reduce the risk of the stroke. Just 30 minutes of activity five days a week can reduce your risk (stroke.org.uk, Stroke Association-April 2012).

-A combination of oral contraceptives: pill can lead to blood clotting and may increase your blood pressure. Should be avoided by women who have other risk factors for STROKE, such as high blood pressure or smoking.

- STROKE of unknown causes: In about a third of cases of stroke in younger people, the cause cannot be identified. The rate of STROKE of unknown causes is higher in young than in the elderly. However, thorough investigations might find a question if there is none of the common risk factors.

The risk of having another stroke is relatively low, if there are many risk factors to a single person or other medical disorders.

Studies have shown that just listening to music every day, can contribute to better recovery after a stroke. According to the researchers, patients who have suffered a STROKE and who listens to music 1-2 hours a day, recovers better both verbal memory and attention and concentration ability. Also those who listens to music, are happier than those who listen to books (audio tape format) or than those who don't listen to anything.

Music could contribute to the stimulation of the brain, due to its plasticity, tries to adjust to losses incurred as a result of STROKE. In particular, losses are represented by speech disorders, attention and movement.

It is important to begin to listen to music as soon as possible after admission to hospital, the brain can change spectacularly during the first weeks and months. The beneficial effect of music, in the recovery of patients could be blamed on the combination between the vocal and instrumental.

Recent studies have examined the effects of music therapy on the patients with STROKE, when he (music therapy) is associated with traditional therapies. One of the studies found that the inclusion of music in the recovery of upper limb leads to the emergence of positive effects not present in the therapy without music (Kim, 2005). In another study, Navak et al. found that subjects in the group who were conducting recovery music were more actively involved and cooperating in therapy, more than patients in the control group (those who were recovering without a musical background) (Nayak et al. 2000). His research was preliminary support of the efficacy of therapy through music, as a complementary therapy.

Recent research has shown that when music therapy is used in conjunction with traditional-style recovery, the rate of recovery in terms of emotional

and social deficit resulting from a STROKE are improved. (Nayak et al., 2000, Kim, 2005, Schauer, Mauritz, 2003, Schneider, Schönle, Altenmüller, Münte, 2007, Jeong, Kim, 2007, Wilson, Parsons, & Reutens, 2006).

Jeong and Kim have examined the impact it has on the CVA music therapy when combined with traditional therapy. Thirty-three STROKE survivors were divided in two groups: the experimental, which was combined with rehabilitation of motor heavy rhythmic music and the control group, which was just recovering based on traditional techniques. After 8 weeks, the results showed that patients in the experimental group had better values at the level of flexibility, the greater the amplitude of movements, a general positive feeling better and an increase in the frequency and quality of social interactions (Jeong, Kim, 2007).

Also, music therapy was used in recovery of motor skill. It has been shown to increase the ability of going on the patients with CVA, application of music therapy (chanting songs), combined with the recovery through traditional methods (Schauer m., Mauritz KH, 2003). Thus, patients in the experimental group were significantly better in terms of speed, stride length, displacement and the deviation from the straight line (all these are indicators of improving walking). (Schauer, Mauritz, 2003).

Schneider et al. have found that patients whose recovery has been used and musical rhythms were significantly better in terms of speed, precision and smoothness of movements, compared with patients in the control group. (Schneider, Schönle, Altenmüller, Münte, 2007).

#### Conclusions:

- cerebrovascular accident (STROKE) occurs when a blood vessel (artery) which supplies blood to the brain a break or is blocked by a blood clot.
- STROKE can be ischemic or hemorrhagic. Ischemic stroke is caused by atherothrombosis or embolism of a major brain artery, while hemorrhagic STROKE is associated with rupture of aneurysm, vascular malformation, a sacular or bleeding disorders.
- The rate of stroke among young and middle-aged people worldwide is increasing, currently representing nearly a third of all strokes.
- the number of strokes among people aged 20 to 64 grew by 25 percent between 1990 and 2010, and that this age group now represents 31 percent of the total number of strokes, compared to 25 percent before 1990.
- Hemorrhagic stroke is the most common cause of CVA among the young adults (40-50%)
- the risk factors tend to affect young people in particular: increased tension, diabetes, blood



- vessel problems, heart diseases, lifestyle factors.
- studies have shown that just listening to music every day, can contribute to better recovery after a stroke
  - The incorporation of music in the recovery of upper limbs leads to the apparition of positive effects that are not present in the therapy without music
  - music therapy is beneficial in recovery of motor skill. Has been demonstrated to improve the ability of waling to the patients with CVA, application of music therapy (chanting songs), combined with the recovery through traditional methods.
  - music therapy increases the speed, precision and smoothness of movements in patients who have suffered a STROKE

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