

# PARTICULARITIES OF HEMORRHAGIC STROKE RECOVERY WITH DIFFICULT WORKING CONDITIONS IN THE PROFESSIONAL BACKGROUND – CASE PRESENTATION

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**Keywords:** noise, stress, hypertension, hemorrhagic stroke, drug treatment, physiotherapy, rehabilitation

**Abstract:** This paper describes a case of hemorrhagic stroke emphasizing the difficult working conditions: noise and stress. The female patient, aged 63, with elementary school education for unskilled workers in the garment trade, is now retired. She presented hypertension that was not treated properly. The onset was suddenly: in the days preceding the stroke, the patient had several hypertensive episodes. She went into a coma with the installation of a right hemiplegia. She attended medical treatment and physiotherapy, as well as a rehabilitation programme, with beneficial effects. The peculiarity of the case lies in the special working conditions that have negatively influenced hypertension and caused or accentuated asthma. Another feature is the undertaking of the rehabilitation programme tailored to the personal needs of the patient who showed good mental status and good cooperation with the physiotherapist.

**Cuvinte cheie:** zgomot, stres, HTA, AVC hemoragic, tratament medicamentos, fizioterapie, recuperare

**Rezumat:** Este prezentat un caz de accident vascular cerebral (AVC) hemoragic având în antecedentele profesionale, condiții deosebite de muncă: zgomot și stres. Bolnava, în vârstă de 63 de ani, cu pregătire școlară elementară, de meserie muncitoare necalificată în domeniul confecții, este în prezent pensionată. A prezentat hipertensiune arterială, care nu a fost tratată corespunzător. Debutul bolii a fost brusc: în zilele precedente declanșării accidentului vascular cerebral, bolnava a avut câteva crize hipertensive. A intrat în comă cu instalarea unei hemiplegii drepte. A urmat un tratament medicamentos și un program de fizioterapie și recuperare, cu efecte benefice. Particularitatea cazului constă în condițiile deosebite de muncă, care au influențat negativ HTA și au determinat și accentuat astmul bronșic. O altă particularitate constă în aplicarea programului de recuperare, adaptat la necesitățile personale, pacienta prezentând o stare psihică bună și o bună cooperare cu fizioterapeutul.

## CASE PRESENTATION

This case of hemorrhagic stroke has been chosen from the experience of the Care and Treatment Unit “St. Nicolae” in Athens, Greece, which deals with the psychomotor recovery of persons with stroke and sequelae after stroke, in order to improve the quality of personal life, the family and social reintegration and eventually production process reintegration according to stroke gravity, recovery degree and of course, the age of the patient.

**Personal Data:** The patient, P.O., female, aged 63, born in Athens, Greece, with elementary school education, labourer in the field of textiles, retired five years ago, was admitted in our unit.

**Admitting diagnosis** is hemorrhagic stroke, right hemiplegia, Levine Folley, seizures, decubitus ulcers, anemia, hypertension, hypercholesterolemia, asthma, chronic respiratory insufficiency, constipation.

**History:** From the family members, we found out that the patient suffered a hemorrhagic stroke due to hypertension for which she was admitted to hospital in a state of emergency, three weeks ago. The patient is discharged in a stage of regression in improved condition.

From the **heredo-collateral antecedents**, we note that both parents suffered from hypertension.

From **physiological personal antecedents**, we note that the first menstrual cycle was at the age of 13 and

climacterium installation at the age of 50. During the fertility period, the patient had two births and no abortions.

From the **past medical history**, we mention a cholecystectomy surgery 15 years ago, and the surgical removal of two lipomas, eight years ago, respectively 5 years from the scalp. From the patient's history, we note that at the age of 29, she had episodes of asthma, which over the years have become more frequent, causing respiratory failure installation. For about 20 years, she is overweight and has hypercholesterolemia, for which she did not follow a proper diet or treatment. 12 years ago, about a year after climacterium installation, she was diagnosed with hypertension, which was improperly treated because the patient was not consistent in the treatment indicated by the physician.

Regarding behaviour and living conditions, the patient smoked from at the age of 29 until the age of 44, but she continued to live in a smoking environment, until six years ago when her husband died, moment which constituted an important stress factor. She drinks alcohol in limited quantities and coffee in moderate amounts daily. As shown in the personal history during life, from his youth, the patient followed a diet high in calories, fat and salt. For the diagnosed diseases, the patient did not follow consistently the prescribed medical treatment.

**Professional antecedents.** Regarding the working conditions, it must be emphasized that the patient worked throughout the working time in garment units, working at the sewing machines. The last job was a particular garment unit in

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Athens, with good working conditions, with well ventilated rooms, with adequate temperature and lighting according to the rules in force and in accordance with the European legislation. The health of the workforce is regularly inspected by the occupational health physician.

Regarding the working conditions, a negative aspect is the fact that in recent years, the patient worked in a large space with many machines, which although modern and quieter resulted in exposure to noise over a long period of time. Also, another occupational risk factor at the last job was the stress caused by the large number of clothing, which had to be finished in a short time causing mental pressure which, together with the improper treatment for hypertension led to the worsening of the patient's health.

It should also be taken into account that in previous years, especially in the early years, when the country legislation was not harmonized to the European one, when the companies were not properly organized and the working regulations were not satisfactorily implemented, the working conditions were poor. The improper climate within the working halls, as well as the poor lighting, the noise produced by the sewing machines and the working time as a stressor, all represented stressful occupational risk factors, which over the years have negatively influenced the health of the patient.

It should not be overlooked the impact on the health of the worker under study, due to increased physical effort due to lifting weights and the presence of fluffs from the material sewn, who had a leading role in triggering asthma and in the development and installation of chronic respiratory failure, a disease whose presence, in this case, have a negative influence on the development of the recovery and stroke prognosis.

In conclusion, the risk factors in the working environment in recent years have been the noise and the stress, and in previous years, the inadequate climate and the poor lighting, as well as the increased physical effort and the fabrics' fluffs.

**History of the disease:** The disease occurred suddenly, with intense headache and vomiting. In the days preceding the onset of stroke, the patient had several hypertension episodes accompanied by headache, which the patient treated alone, only with some diuretic medication of the antihypertensive treatment indicated by the physician, which she neglected. The general condition of the patient worsened and she was transported to the emergency department of neurology at the Emergency Hospital in Athens. After hospitalization, the patient went into a coma with right hemiplegia installation. During hospitalization, which lasted three weeks, the patient responded to treatment, leaving the hospital in improved condition.

**General clinical examination upon admission to our unit.** The patient admitted to our unit is confined to bed with right hemiplegia in a state of semi-consciousness, with the ability to feed only by Levine. She is 161 cm in height, weighting 86 kg, with good nutritional status with excess adipose tissue, but with pale facies and skin with decubitus ulcers of which the deepest in the coccyx. The functioning of the muscle and osteo-articular system at the level of the upper and lower right limb is impaired. She presented slight breathlessness due to the chronic respiratory insufficiency accentuated by the presence of the rhino-gastric probes for her feeding and by the inability to eliminate the excessive bronchial secretions. Cardiac activity is rhythmic, with a frequency of 82 beats / min. and BP of 130/65 mmHg. She experienced constipation, and at the level of the urinary bladder, we mention the presence of the urinary probe, type Folley no. 22. The patient presents speech and swallowing disorders, prolonged periods of somnolence

alternating with short periods of limited communication. Cough reflex is diminished. Babinski reflex is present.

**Laboratory examinations** performed in hospital helped to setting the main diagnosis and the secondary ones, as well as the differential diagnosis. Besides routine examinations (blood and urine tests, chest radiograph, electrocardiogram etc.), the patient was subjected to special investigations, such as: skull radiography, EEG, fundus, triplex and Doppler of bilateral carotids and heart, computerized axial tomography in various stages of evolution of stroke, on admission, 15 days after onset, at discharge, magnetic resonance. The conducted examinations helped in the differential diagnosis with coma of another causes, hypertensive encephalopathy, hypertension crisis, ischemic, thrombotic stroke or by embolism, and for hemorrhagic stroke, subarachnoid hemorrhage. The above-mentioned examinations, together with the general and speciality clinical examination supported the main diagnosis of hemorrhagic stroke of the left hemisphere with cerebral edema, inoperable. The performed examinations have also supported the other secondary diagnoses of hypertension, hypercholesterolemia, iron deficiency, asthma with chronic respiratory insufficiency, epilepsy.

The treatment received during hospitalization was a control treatment for the stabilization of blood pressure, electrolyte, fluid and nutrients intake parenterally. At the same time, the patient was subjected to a treatment against cerebral edema and a supportive treatment of the vital functions, being in a state of coma, in order to prevent complications, which in most cases worsen the general condition and make uncertain the evolution of the disease. Despite the efforts to avoid complications, after inserting the rhino-gastric probe and the Folley urinary catheter to prevent urinary retention, the patient did double acute infection, both respiratory and urinary. Both infections were treated with antibiotics in combination and have been solved. The other side and chronic diseases, as well as the decubitus ulcers were also treated.

The patient is discharged and transferred to our unit with the following treatment: Ramipril + Hydrochlorothiazide (5 +25) mg, 1 TB / day, Atorvastatin 20 mg., 1 TB / day 100 mg Phenytoin 1cps. 3 times per day, Lactulose, 30 ml. / day; iron succinyl or protein. Sol. Sd. 800 (Fe + + 40 + +) mg./15 ml. - Vial.; 2 amp. PO / day + salbutamol sulfate monohydrate Ipratropium bromide inhalation solution nebulizer (0.5 to 2.5) mg. / 2.5 ml., 1 amp. 4 times per day, Budesonide inh.ne.su. 0.25 mg / ml., 1 amp. 2 times of the day, Acetylcysteine granules in single dose 200 mg. / sachet, one sachet 3 times per day.

In our unit, the drug therapy indicated at discharge from hospital was administered in the first period, and further on it was adapted to new situations and development needs of the patient. Following the laboratory examinations, it was detected vitamin B12 deficiency and the presence of E. coli in urine culture, which were treated. The patient's health evolution within our clinic required several times the treatment of respiratory and urinary infections. After a period of three months, it was possible to remove the rhino-gastric probe and after about six months, the removal of the urinary probe after gymnastics for the rehabilitation of the urinary bladder. Constipation was solved, which is a major concern for the immobilized patients, as well as continued care of bedsores with their final cure.

**Hospital discharge recommendations** were to follow an appropriate hygienic-dietary regime with a balanced calorie intake with decreased consumption of salt and fat.

Drug treatment is to be fairly administered under continuous supervision and guidance of physicians of different specialties, according to the state of health. It was also

recommended that the patient should be regularly checked in terms of clinical and laboratory tests and to continue the physiotherapy treatment for locomotion recovery.

The health status of the patient at the time of leaving the hospital, as well as discharge recommendations made absolutely necessary to continue the treatment and recovery in a specialized unit. Accordingly, the patient was transferred to our unit.

### **Physiotherapy and recovery treatment**

The physiotherapy programme had started even from the hospitalization period of time, after the first days of admission, when it was managed to stabilize the patient. In the first phase, there was further respiratory physiotherapy to recover the paresis installed immediately after the hypertension episode. As it is known, paresis makes any move impossible because of the lack of muscle tone; the physiotherapist of our unit started the recovery programme by passive kinezioterapy three times a day, avoiding the patient to get tired. Gradually, as the patient's condition has stabilized, in the next stage, in the period of spasticity, both the upper and lower limb were worked upon, through flexion-extension movements of the limbs. Further, spasticity has regressed and the patient was able to cooperate better with the physiotherapist and to make more difficult and complex movements. In the next stage, the programme focused on deformations treatment, education and the paralyzed muscles to regain the ability to walk and serve herself. Our patient was able to take the first steps and eat only after a period of 19 months. Although she managed to recover much of the disability, the patient continued to remain in our unit and to participate in the recovery programme in order to gain stable results.

**The peculiarity of the case:** What makes this case to be discussed and presented are on hand the peculiarities of behaviour and working conditions that have led to poor health, bringing about the occurrence of stroke, and on the other hand, the peculiarities of the rehabilitation programme in our unit after the installation of the hemorrhagic stroke.

One of the particularities of the case is the difficult working conditions, where the main occupational risk factors are noise, stress, increased exercise, which negatively influenced hypertension, as well as the excessive fluffs from the fabrics worked on the sewing machine, which over years have caused and accentuated both asthma and chronic respiratory failure installation. Upon the onset of the hemorrhagic stroke, which was mainly due to hypertension treated incorrectly, the two respiratory diseases worsened the general condition of the patient, the respiratory function and the evolution of stroke's treatment and prognosis.

Stroke severity, the general condition of the patient, the presence of asthma and the chronic respiratory failure have negatively influenced the neuromotor recovery. The patient attended our unit recovery programme, which is usually applied in such situations, tailored to personal needs, but unlike most cases, the results of the programme were delayed. In this regard, the particularity of the case is that persistence in implementing a comprehensive programme of recovery had a positive outcome after a period of one year and seven months, our efforts and the patient's being successful.

Another feature in this case is that throughout the course of the disease and rehabilitation programme, the patient had a good mental state and good cooperation with the physiotherapist.

### **Commentaries:**

This case emphasises the importance of the occupational risk factors and of the working conditions that influenced the health of the patient, the presence of chronic

diseases and stroke development. The existence of respiratory infections which started and evolved under special working conditions of the patient at the time of the hemorrhagic stroke, acted as aggravating factors of the disease, knowing that one of the key measures of treatment is to keep the airway clear for a better oxygenation of the brain. The ability of airways to remain free was lower in the first period of time, as a result of decreasing the level of communication with the surrounding environment, of reducing the cough reflex for secretion removal as a result of swallowing and motility disorders, which made absolutely necessary the presence of rhino-gastric Levine probe for food and liquid intake. The existence of repeated acute respiratory infections and urinary tract infections, after the insertion of the Folley probe, both in the hospital and in our unit worsened the health evolution of the patient and delayed the neuromotor recovery.

Our patient, being confined to bed for a long time, received special attention to decubitus ulcers, but also in order to prevent the occurrence of plagues. Patient care by nurses trained in this regard, under continuous observation and guidance of doctors, surgical wounds cleaning, suprainfection prevention through a long-term sustained treatment, both locally and generally resulted in healing the decubitus ulcers. In this medical unit, we apply our own methods of care and treatment depending on the state and evolution of the wounds and on the patient. It is of particular importance to regularly change the patient's position in bed, at time intervals of two hours. Our unit has an oven to sterilize the sheets and clothes that come in contact with the skin, which together with air mattress on which the patients are sleeping helped to the good care of the skin and to the healing of the existing bedsores preventing the occurrence of new ones. One characteristic of our patient is that, although skin care and multiple bedsores required a long-term effort by the whole team, we managed their complete healing. This led to the proper development of the case and to prognosis improvement.

The application of the physiotherapy programme even since the period of hospitalization, its persistent continuation and adaptation to the different stages the patient went through in our unit, finally led to a satisfactory level of neuromotor recovery. Even since the coma period, our patient was particularly helped through respiratory physiotherapy aiming at preventing the growth and retention of bronchial secretions, atelectasis and pneumonia. Physiotherapy of respiratory function was performed by repeated changes of the position of the patient in bed at, through chest vibration techniques in order to eliminate secretions. On several occasions, when it was necessary, both in hospital and in our unit mechanical, removal of secretions by bronchial aspiration was made.

Concurrently with the respiratory physiotherapy, the neuro-motor recovery of right hemiplegia also commenced; the programme continued until gaining the final results. As shown in the literature and from the experience of 20 years of our unit, the physiotherapy programme should begin as early as possible, knowing that the greatest degree of recovery is achieved in the first two months of the stroke production and a smaller percentage in the next six months.

Therefore, the first 6-8 months of physical therapy programme are the most important because they bring about the most of the results in the neuromotor recovery process. In our case, the general condition of the patient, repeated infections, the presence of Levine and Folley probes, decubitus ulcers, all of these hampered and delayed the implementation of the rehabilitation programme in the first 6-8 months, insisting more on the passive physical therapy, so during this period of time we did not record the expected results, thereby decreasing our hope,

and the patient's of achieving a certain independence in performing certain activities. However, our team has decided to continue the sustained recovery programme daily and with a good cooperation of the patient succeeded that in the coming months, the patient could sit on the chair and move alone, with a three point cane after a total period of one year and seven months after the onset of the disease. We managed a good recovery of the right lower limb than the right upper limb, which remained edematous, with a low muscle tone and reduced motility. Within the hours of physiotherapy and occupational therapy, our patient was able to learn to use with as much skill the left upper limb, and with the help of the right upper limb, which in terms of motility improved in a percentage of 40%, the patient also began to execute fine movements, such as the passage of a thread beads to make a bracelet.

In the course of the disease and recovery process, a positive role has been played by the very good mental state of the patient due to her optimistic personality and to the psychological support from the part of the unit psychologist together with the whole working team. From the literature, we know that mental depression is very common in cases of stroke, but in our case, the depression did not affect the patient.

As it is known, when the stroke occurs in the left hemisphere, we also have speech disorders. These have been fully corrected by using the speech therapist, and thus, the patient's physical condition improved even more.

This case is an exception regarding the field of activity of our medical unity, because unlike the majority of treated cases and the data in the literature, it appeared that recovery may yield results after a period of time on condition to persist in applying the recovery programme and there is good cooperation from the patient.

**Conclusions:** By observing the evolution of this particular case, the following conclusions can be drawn:

- it is important to avoid any harmful habits such as overeating, smoking, that in the case of our patient, have negatively influenced over the years the quality of blood and the general health.
- from the case presented, it seems necessary to prevent occupational risk factors and improve working conditions. This was not possible in our patient having repercussions on health.
- the occupational physician must be present in the various business units, as well as the need for regular check ups to the family doctor with the proper application of the appropriate treatment.
- it is important to regularly check the blood pressure and the proper treatment of hypertension and chronic diseases in general. In the case of our patient, preventive measures would be particularly helpful, given the family history with both parents being hypertensive.
- once installed the hemorrhagic stroke, the patient should be immediately transported to the hospital. Immediate intervention and care by our specialized staff of patients, both during the acute and recovery phase proved to be of particular importance.
- to decrease mortality and degree of disability during hospitalization, the basic functions of the body should be supported, the diagnosis and treatment of each neurological disorder being very important, as well as the treatment of all systemic complications.
- it is important to prevent the most common and serious respiratory complications, reflux pneumonia, due to the presence of decubitus position by immobilisation.

- both during hospitalization and further on during the recovery period in our unit, a permanent importance and care was given to the decubitus ulcers. With proper and sustained care of these wounds, we managed to avoid any suprainfection with various aerobic and especially anaerobic microbes, which could have been represented the cause for septicaemia with fatal consequences for the patient.
- the possibility of making special investigations with modern devices, both in the hospital and in our unit were a great help in establishing the correct diagnosis and therefore, in applying the appropriate treatment and rehabilitation programme for the patient.
- regular clinical and laboratory check up in our unit, conducted by the medical personnel and the specialized auxiliary staff, with the prevention and treatment of all symptoms and diseases presented by the patient during rehabilitation, have led to improved prognosis for life and her successful neurological recovery.
- the psychological support given to the patient by the psychologist, the social worker and the entire medical team, along with the support of her family, who have been trained in this regard, were of a great help in implementing the complex programme of rehabilitation and in gaining the expected results. Of course, the patient's optimistic character was of particular importance.
- starting the recovery programme even during the period of hospitalization, its development within our unit, which is a medical unit specialized in this field, the quality of services provided by our physiotherapist in cooperation with the speech therapist and the entire medical and paramedical team, the good cooperation with the patient and family, all these have competed in improving the health of the patient and in increasing the level of independence in carrying out certain movements and actions.

**Proposals:** Following the presentation and discussion of this case, as well as taking into account a professional experience of 20 years of our unit, the following proposals are worth mentioning:

1. to try to improve lifestyle through proper nutrition, balanced physical activity, removing all negative habits such as smoking, in order to be able to decrease the risk of stroke.
2. regarding the workplace, it is important to have an occupational physician who should monitor the health of employees through regular check ups to, as well as the compliance with regulations in force.
3. blood pressure should be checked regularly and hypertension should be properly treated, knowing that it represents the main factor for the occurrence of a hemorrhagic stroke.
4. in case of a hemorrhagic stroke, the patient should be transported immediately to a hospital for supportive care, investigations and treatment, and afterwards, after stabilizing the patient, it is imperative that he/she be transferred to a specialized unit for the recovery of chronic diseases, with trained personnel in this regard, to continue the treatment under medical supervision, as well as the neuro-motor rehabilitation programme.
5. it is important to begin the physical therapy and recovery immediately after the first days after stroke onset, even during hospitalization, after stabilizing the patient and to continue it in specialized units.

6. to continue physical therapy to achieve the desired results. In the case of our patient, persistence in achieving the final results of the recovery has proved of great help to the patient, so we insist not to give up the recovery plan if the results fail to appear.
7. to pay particular attention to the physical support of the patient by the psychologist, but also by the entire staff of the unit trained in this regard, noting that after the stroke, in most cases, patients record symptoms of mental depression.
8. to continue working closely with the family of the patient with a view to recovery and psychological support, as well as training the family members in this regard.
9. to provide financing for research with a view to improve the treatment and recovery methods.
10. we consider it necessary the functioning of a large number of medical units specialized in the treatment and recovery of chronic diseases and stroke in general, to provide medical service packages priced as close to the real possibilities of stakeholders and their families.
11. it is well known, that in most countries, intensive recovery has a high cost, which results in limiting the opportunities to address the state in creating, equipping and functioning such units, with a view to provide the necessary support to reduce disability and to reintegrate these patients in the family, society, and eventually in the field of production.
12. because the costs of recovery programmes are high for the health insurance houses, we suggest to make as many efforts to prevent stroke. Measures to prevent the occurrence of stroke are the most important and represent the key to success in lowering mortality and morbidity.
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