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The Level of Knowledge of Nurses in Surgical Departments about the Occurrence of Stroke in Patients in the Postoperative Period

Poziom wiedzy pielęgniarek oddziałów chirurgicznych na temat występowania udaru u pacjentów w okresie pooperacyjnym

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Abstract

Introduction. Each year 80 000 Poles are suffering from stroke. The most common risk factors are hypertension, diabetes and complications, hyperlipidemia, obesity, atrial fibrillation. Lifestyle modification, such as diseases controlling, diet changing, exercises, stop smoking and limiting alcohol consumption are known as stroke prevention. Thrombectomy and thrombolytic therapy definitely increase long-term survival and prognosis.
Aim. Objective of the work is assessment of surgical nurses knowledge level about postoperative stroke.
Material and Methods. The research was conducted on a group of 55 randomly chosen surgical nurses. The diagnostic survey method with a proprietary questionnaire was used for the research.
Results. Nurses knowledge was poor. Education and age affect to answers. Higher education qualification nurses have higher knowledge level relative to less educated nurses. Younger nurses have higher knowledge level than older nurses.
Conclusions. Cardiosurgery and vascular surgery are charged as the most risk onset postoperative stroke. Knowledge of surgical nurses about risk factors, prevention, symptom, complications and procedures in case of stroke onset have particular meaning in postoperative caring. **(JNNN 2020;9(4):138–144)**
Key Words: knowledge, nursing care, postoperative period, stroke

Streszczenie

Wstęp. Każdego roku na udar mózgu choruje 80 tysięcy Polaków. Jako najczęstsze czynniki ryzyka podkreśla się nadciśnienie tętnicze, cukrzycę i jej powikłania, hiperlipidemię, otyłość oraz występowanie migotania przedsionków. Jako działania profilaktyczne uznaje się modyfikację stylu życia z uwzględnieniem kontroli chorób podstawowych, zmianę diety, ćwiczenia fizyczne, ograniczenie nałogu tytoniowego oraz spożywania alkoholu. Wprowadzenie trombektomii mechanicznej oraz terapii trombolitycznej pozwoliło na zwiększenie przeżywalności i poprawę rokowania w tej grupie chorych.
Cel. Celem pracy była ocena poziomu wiedzy pielęgniarek pracujących w oddziałach chirurgicznych, na temat udaru mózgu w okresie pooperacyjnym.
Materiały i metody. Badaniem objęto 55 pielęgniarek pracujących w oddziałach chirurgicznych. W pracy zastosowano metodę sondażu diagnostycznego i analizy piśmiennictwa. Posłużono się autorskim kwestionariuszem ankiety.
Wyniki. Wiedza badanych osób jest na niskim poziomie. Dowiedziono, iż wykształcenie oraz wiek ma wpływ na deklarowane przez respondentki odpowiedzi. Osoby z wykształceniem wyższym wykazały się wyższym poziomem wiedzy w stosunku od osób z wykształceniem średnim. Pielęgniarki młodsze posiadają większy zasób wiedzy od pielęgniarek starszych.
Wnioski. Procedurami operacyjnymi, które obciążone są największym ryzykiem wystąpienia udaru w okresie pooperacyjnym, są operacje kardiochirurgiczne i naczyniowe. Wiedza pielęgniarek na temat czynników ryzyka,

profilaktyki, objawów, powikłań i wdrożenia postępowania w przypadku wystąpienia udaru mózgu, ma szczególne znaczenie w pielęgnowaniu pacjenta w kluczowym okresie po operacji. **(PNN 2020;9(4):138–144)**
Słowa kluczowe: wiedza, opieka pielęgniarska, okres pooperacyjny, udar mózgu

Introduction

In recent years, there has been an increase in the expected life expectancy, which increases the probability of the occurrence of ailments and diseases characteristic of later stages of life, including strokes [1].

A stroke is a direct threat to life and in 80% of cases it is an ischemic stroke which occurs as a result of occlusion of the vessels with an embolic material or a thrombus [2]. It is the second leading cause of death in the world. In 2017, 2.7 million people died from complications related to the occurrence of stroke [3]. In Poland, about 80,000 cases are reported each year [2]. In the case of suspected cerebral dysfunction, taking immediate rescue measures and calling emergency services significantly increases the chances of survival and improves the prognosis [4].

The postoperative incidence of stroke is a less understood and equally significant issue due to the surgical procedures performed in the increasingly elderly people with risk factors and comorbidities. Assessment of the level of knowledge of people actively involved in perioperative care has a significant impact on the quality of nursing and the safety of patients in surgical departments [5]. Careful observation is critical in the key postoperative period, and the associated knowledge of nurses about risk factors, symptoms, preventive measures, and management and available therapies is essential.

In developing countries, the health determinants of the society have been converting towards the prevalence of chronic non-communicable diseases for years. Due to the aging population and the distinct prevalence of these diseases, an increase in the incidence of ischemic stroke cases is expected in the coming years [6].

Stroke is the second leading cause of death worldwide. According to the Institute of Health Metrics and Evaluation database, 2.7 million people died from ischemic stroke in 2017, which accounted for 13% of all deaths [3]. High- and middle- income countries reported the highest number of deaths, i.e. 94/100,000 and 126/100,000 of citizens. In addition to high morbidity and mortality rates, there is a growing group of patients who, as complications of stroke, experienced permanent health impairment or permanent disability. The Disability Adjusted Life-years (DALYs) indicator, in 2017 amounted to 132,051,366 years [3]. In 1990–2017, the number of DALYs increased by 65% for men, and by about 38% for women [7]. In Europe, stroke has been one of the leading causes of death and disability

for years. Due to predictions for an aging population, the forecasts are for a 35% increase in the elderly. Each year, 1.3 million Europeans experience a first-stroke ever (FES). By 2025, the number of people suffering from stroke could reach 1.5 million. The direct costs of medical interventions amount to EUR 35 trillion each year [8]. The incidence of stroke in European countries is heterogenous. The data on FES from 2010 show that the most frequent cases of the disease occur in Lithuanians 434/100,000 people and Estonians 479/100,000 people, while the citizens of France have the least frequent illness: 83.6/100,000, the Netherlands 83.5/100,000, Italy 71.2/100,000 people [9].

In Poland, there are approximately 80,000 cases of the disease each year. The incidence is comparable to the neighbouring countries of Europe and amounts to 125/100,000 women and 177/100,000 men [2].

Being able to accurately recognize the symptoms of a stroke and make a decision about the commencement of rescue operations is extremely valuable for every person. The motto "time is the brain" is an ideal illustration of the need to start treatment immediately [10]. Suspected stroke or recent stroke should always be considered a medical emergency.

The diagnosis of the initial period of stroke is carried out in 3 places:

1. at the site of the disease — stroke occurrence: through the assessment of an emergency medical doctor, paramedics, GP,
2. in a hospital emergency department — through the assessment of specialist doctors,
3. in the neurological ward-stroke unit [11]. However, a patient who is in any other department can have a stroke. The FAST test is an easy and quick test for pre-clinical screening. It can be carried out by relatives of the patient, by emergency call dispatchers or paramedics. Its name is a memo-technical abbreviation of English words. "Face" means the face and assesses the occurrence of facial asymmetry, "arm" indicates the arm, assesses changes in muscle strength, "speech" means speech disorders, "time" counts the time from the first signs of the disease [12]. The order in which appropriate steps are taken with the injured person is set out in rule 8D:

a. detection — Recognizing the signs,
b. dispatch — Alerting the Medical Rescue Team,
c. delivery — Arrival of the patient to the Hospital Emergency Department,
d. door — Patient admission,

e. data — Collecting information,
f. decision — Establishing the correct therapy,
g. drugs — Selection of appropriate medications,
h. disposition — Immediate admission to a targeted stroke unit [13].

Transporting the patient to the nearest stroke unit guarantees urgent diagnostics and increases the chances of adequate treatment. It should be noted that at the same time between the assessment of the patient's neurological status, basic vital parameters should be assessed: respiratory rate, heart function — including an ECG, blood pressure measurement, saturation measurement and blood glucose measurement.

The next step in the diagnostic procedure is the performance and evaluation of laboratory tests of peripheral blood. It includes the determination of the level of the following elements: blood glucose, morphology, coagulogram, ionogram, lipidogram, creatinine, aminotransferases, D-dimer, CRP protein level [14].

The paper assesses the level of knowledge of nurses working in surgical departments about postoperative stroke.

Material and Methods

The study group consisted of 55 nurses employed in the surgical departments of one of the Tri-City hospitals. The study used an original questionnaire specifying the level of knowledge of the respondents about symptoms and prevention, risk factors, targeted treatment and complications of stroke.

The level of knowledge of the respondents about stroke was defined as the sum of correct answers in the questions checking the knowledge. Each correct answer was counted as 1 point. The possible results ranged from 0 to 10. The average of the results was 4.7 points, with the standard deviation of 2.1 points. Knowledge of respondents according to the adopted criterion that the number of points from 0 to 4 indicates a low level of knowledge, with a result of 4.7 points indicates a low level of knowledge among nurses in surgical wards.

Results

Question 10 on the proper management of stroke in a surgical department in the postoperative period has the highest percentage of good answers. Nurses indicated the correct answer in 84%. This proves the staff's knowledge of the implementation of appropriate procedures in the event of an unusual event for the environment of surgical departments, such as ischemic

or haemorrhagic stroke. Undertaking rescue actions and immediate notification of the medical staff significantly increases the patient's chances of survival and subsequent recovery. Only 7% of people would choose to observe the patient during the first 40 minutes. The vast majority of people chose immediate nursing actions combined with coordination of implementing further actions in the chain of survival. Question 10, about the proper management of a postoperative stroke patient in a surgical department, has the highest rate of correct answers.

Nurses are also knowledgeable about the definition of stroke itself (71% correct answers), the type of stroke most common (71% correct answers) and the risk factors for perioperative stroke (67% correct answers). In turn, in the questions examining the knowledge of the available forms of treatment and the possible duration of thrombolytic treatment, the correct answers were indicated by 56% and 47% of the respondents, respectively. Thrombolytic therapy and mechanical thrombectomy are known to half of the staff as models of correct management of stroke patients.

All the symptoms of a stroke were correctly marked by only 18% of the respondents. Most — 81% of the respondents marked the correct answer: paresis of the limb and/or lower limb. This is one of the more common symptoms of a stroke. In turn, 78% and 76% considered the following answers as appropriate: disturbances in motor coordination and coordination, and visual disturbances. 68% of people did not correctly identify cognitive impairment as a symptom of stroke.

The most common problems that may occur after a stroke were correctly mentioned by only 5% of the respondents. Most people (78%) indicated dysphagia as one of the problems. In the question researching the knowledge about the FAST test, 29% of people indicated the correct answer. Most — 31% of respondents marked the wrong answer, thus treating the FAST test as a test used to assess complications of a stroke.

Proper management of rt-PA administration is known to 27% of respondents. Most people (36%) indicated an incorrect answer — 5% in a bolus, the rest of the drug in the infusion pump. Apart from examining the level of nurses' knowledge about stroke management in the perioperative period, it was also examined which factors influenced the results obtained by the examined patients. The influence of variables such as: age, education, completion of specialization training and place of residence was examined. The study showed that education (F=7.522, p=0.001) and age (F=3.239, p=0.03) had a statistically significant impact on the obtained result, but no correlation was found between the completion of specialization training and the place of residence.

The highest average (5.69 points out of 10 possible) of the answers was obtained by people with higher

education who are the Master of Nursing, and the lowest (3.68 points out of 10 possible) — by people with secondary medical education, completed medical secondary school or medical college. The relationship between the level of knowledge of nurses and education probably depends on many factors, however, examining all the causes and their analysis would require extending the scope of the study. The average points obtained by the nurses varied with age. The highest average (6.63 points out of 10 possible) was achieved by nurses aged 18 to 34, while the lowest (3.92 points out of 10 possible) was reported by the respondents aged 55–64.

Discussion

Objective of the work is assessment of surgical nurses knowledge level about postoperative stroke. The research was conducted on a group of 55 randomly chosen surgical nurses. In our study all the symptoms of a stroke were correctly marked by only 18% of the respondents. Most — 81% of the respondents marked the correct answer: paresis of the limb and/or lower limb. Furthermore disturbances in perception, attention and memory may be a harbinger of an impending vascular incident [15], but they are probably not perceived by the respondents as one of the symptoms.

The most common problems that may occur after a stroke were correctly mentioned by only 5% of the respondents. Most people (78%) indicated dysphagia as one of the problems. Compared to the studies by the authors, Szypulska and Gutysz-Wojnicka, nurses indicated 54.84% of dysphagia as a potential problem [16]. In the present study, the respondents were more familiar with swallowing disorders as one of the problems occurring in patients after stroke. The least diagnosed was neglect (semi-neglect syndrome), which can be observed many times in this group of patients. Almost half of the respondents correctly consider depression as one of the problems that occur in patients after a stroke. The role of supporting nurses in the process of diagnosis and treatment of depression is indispensable, therefore the necessity to identify depression after stroke as a potential threat is justified [17].

In the question researching the knowledge about the FAST test, 29% of people indicated the correct answer. Most — 31% of respondents marked the wrong answer, thus treating the FAST test as a test used to assess complications of a stroke. The FAST acronym was part of international public awareness campaigns about the importance of quick identification of the threat and thus preventing delays in calling for professional help [18]. In the event of atypical symptoms in a patient hospitalized in a surgical ward, knowledge of this test may be equally useful.

Proper management of rt-PA administration is known to 27% of respondents. Most people (36%) indicated an incorrect answer — 5% in a bolus, the rest of the drug in the infusion pump. It is most likely related to the relatively rare supply of alteplase in the surgical ward. It is a targeted treatment, dedicated to highly specialized stroke units or hospital emergency departments [19]. The drug administration procedure is not related to routine activities performed as part of perioperative care.

The highest average (5.69 points out of 10 possible) of the answers was obtained by people with higher education who are the Master of Nursing, and the lowest (3.68 points out of 10 possible) — by people with secondary medical education, completed medical secondary school or medical college. During the undergraduate studies, nursing students are trained in the care of a person with neurological disorders, including a stroke. Second-cycle students receive knowledge dedicated to neurological disorders, including strokes. Extending the knowledge acquired during undergraduate studies and supplementing specialist departments is the domain of second-cycle studies. Nursing training in nursing high schools ceased in 1997–1998, while compulsory undergraduate studies appeared in 2002. Hence, knowledge in this group about stroke may need to be updated [20].

Perioperative stroke most often concerns cardiac surgery and carotid endarterectomy — about 4.5% [21]. Other procedures are burdened with a lower risk of neurological complications — at the level of 0.1–0.6 % [22]. When the number of factors is 5 or more, the risk increases to 2% [23,24]. Most patients are burdened with at least 1 risk factor, in case of coexistence of more factors — they add up.

In the preoperative period, the anaesthetic team conducts an interview with the patient in order to determine the risk of the surgical procedure itself, and can prepare the therapeutic team for the possibility of cardiovascular complications, including ischemic or haemorrhagic stroke. According to the guidelines of the European Society of Cardiology, the patient management algorithm should include the following points:
— assessment of the patient's condition and comorbidities, including cardiac complaints to modify current therapy,
— determining the risk of surgery — based on anticipated complications, e.g. in the form of a stroke or other neurological deficits within 30 days. The low-risk group includes procedures in the field of endocrinology, ophthalmology, dentistry, urology and minor orthopaedic procedures. The intermediate risk group includes abdominal, urology, head and neck procedures, and major orthopaedic procedures. The high-risk group includes vascular and cardiac surgery,

— assessment of the patient's ability to undertake physical activity. Value of 4 MET points — metabolic equivalent means the equivalent of the patient's fitness in a short run or entering the 2nd floor of the building up the stairs. Adequate physical condition is believed to significantly improve a patient's postoperative prognosis, even when there are serious risk factors,

— identification of other risk factors. They relate to burdens in the form of a stroke, myocardial infarction, chronic kidney disease or insulin-dependent diabetes. In clinical practice, the Lee index is used. Each risk factor equals 1 point with a Lee index ≥3 being a high risk,

— the last stage is carrying out additional tests: stress test, resting echocardiography, 12-lead electrocardiogram, angio-CT of the carotid arteries, Holter ECG [25,26].

Risk reduction strategies include:

— implementation of appropriate pharmacological treatment (β-blockers, stains, acetylsalicylic acid),

— prophylactic coronary revascularization,

— appropriate premedication mixtures (non-steroidal anti-inflammatory drugs with analgesic effect, benzodiazepines, proton pump inhibitors and antiemetic drugs when the patient declares the syndrome of postoperative nausea and vomiting — PONV),

— selection of appropriate anaesthesia, if possible (general anaesthesia with intubation, epidural, spinal anaesthesia, general anaesthesia with the use of a laryngeal/face mask, regional anaesthesia, peripheral conduction anaesthesia) [27,28].

In the case of intraoperative complications, the patient may be transferred to the intensive postoperative supervision unit or the intensive care unit by the decision of the anaesthesiology and operating team. When the surgery proceeds smoothly, the patient, after a stay in the recovery room, is referred to the post-operative mother ward, to the recovery room. A qualified nursing team carries out the care of the patient on an ongoing basis and constantly monitors the patient's condition in order to observe disturbing symptoms [29].

Preventive measures in the preoperative period are associated with a thorough assessment of the risk of complications, both during and after surgery. The actions that the patient himself can take before the surgery are related to lifestyle modification. A patient who received proper education on the principles of a healthier lifestyle and changed his diet, started physical activity, maintained proper body weight or lost weight, quit smoking, reduces the risk of stroke by at least 3 times, both before and after surgery [30]. In the intraoperative period, the most important risk factor is heavy bleeding during surgery. With blood loss, and hence the risk of disseminated

intravascular coagulation (DIC), the risk of stroke, most notably a haemorrhagic stroke, increases. For any procedure where blood loss due to surgery or preoperative blood loss is expected, a haemoglobin index of less than 10 g/dl should be reserved appropriately for blood products. If intraoperative bleeding is greater than expected in the surgical procedure, blood should be transfused immediately.

In the postoperative period, the greatest preventive effect is demonstrated by the patient's haemodynamic stability and appropriate pain management. Regular monitoring of the balance of fluids, basic vital parameters — RR, SpO2, AS, respirations and an appropriate response to disorders is extremely important from a clinical point of view. The use of multimodal analgesia is a chance for the patient to recover faster. Proper pain management significantly reduces mortality and postoperative morbidity and accelerates the mobilization of the patient [31]. Most strokes take place in the postoperative period, within 24 hours, hence increased vigilance at this critical time is one of the most appropriate behaviours [32].

Conclusions

1. The level of knowledge of nurses about postoperative stroke occurrence is low.
2. Nurses with higher education are characterized by a greater level of knowledge in relation to nurses with secondary education.
3. Nurses' knowledge of postoperative stroke varies with age.
4. Completion of specialization training does not affect the level of knowledge of nurses about postoperative stroke.
5. Nurses' knowledge of postoperative stroke does not differ depending on where you live.

Implications for Nursing Practice

Postoperative stroke incidence is an important aspect of surgical procedures in people who are at risk of stroke and comorbidities. Assessment of the level of knowledge of nurses actively involved in perioperative care has a significant impact on the quality of nursing and the safety of patients in surgical departments. Nursing observation and monitoring of vital signs are crucial in the key postoperative period. Therefore, nurses' understanding of the risk factors, symptoms, preventive measures, management and available therapies for stroke is especially necessary to take the necessary interventions.

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