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Management of Constipation in Neurosurgery Patients

Postępowanie z zaparciami u pacjentów neurochirurgicznych

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Abstract

Constipation is a common complication in patients treated in neurosurgery clinics and it is an important problem. Neurosurgery nurse has an important role in assessment and prevention, of the disease. Constipation can be prevented in neurosurgery patients, with effective constipation diagnosis and side effects resulting from unnecessary use of drugs can be minimized. Within this framework, the nurse diagnoses the excretion habits, listens to the abdominal sounds of the patient, palpates the abdomen for distention and uses reliable and safe diagnosis tools. With the most important nursing interventions to prevent constipation, one can include the increase the intake of liquids in patients, making them do exercise and increasing their mobility as well as their intake of fibers and applying necessary pharmacological methods compliant with the recommendations from the physician. In patients with neurosurgery, constipation is a problem which can be prevented by using extensive nursing assessment and effective nursing interventions. This compilation aims at highlighting the fact that constipation is a serious symptom especially in neurosurgery patients and also at revealing the importance of nursing assessment. (JNNN 2014;3(2):81–87)

Key Words: neurosurgery, nursing diagnosis, constipation

Streszczenie

Zaparcie to jedno z częstszych powikłań i jednocześnie poważny problem obserwowany u pacjentów leczonych w klinikach neurochirurgii. Pielęgniarka neurochirurgiczna odgrywa bardzo istotną rolę w diagnostyce i przeciwdziałaniu zaparciom. U pacjentów neurochirurgii możliwe jest przeciwdziałanie zaparciom za pomocą właściwej diagnozy, dzięki której unika się zażywania niepotrzebnych leków oraz zmniejsza skutki uboczne ich stosowania. Pielęgniarka w tym zakresie rozpoznaje nawyki opróżniania jelit, osłuchuje ruchy jelit, wykonuje badanie palpacyjne brzucha w kierunku rozdęcia, stosuje właściwe i miarodajne narzędzia diagnostyczne. Najważniejszymi działaniami podejmowanymi przez pielęgniarkę w celu przeciwdziałania zaparciom są: zwiększanie ilości przyjmowanych przez pacjenta płynów, zwiększanie częstotliwości jego ruchów, mobilizowanie pacjenta do ćwiczeń, zwiększanie ilości przyjmowanego błonnika oraz stosowanie zaleceń farmakologicznych lekarza. Zaparcie u pacjentów neurochirurgii jest powikłaniem, któremu można przeciwdziałać dzięki kompleksowej diagnostyce oraz skutecznym działaniom pielęgniarskim. Celem tego opracowania jest w szczególności podkreślenie, jak ważnym symptomem u pacjentów neurochirurgii jest zaparcie oraz jak ważna jest diagnostyka pielęgniarska. (PNN 2014;3(2):81–87)

Słowa kluczowe: neurochirurgia, diagnostyka pielęgniarska, zaparcia

Introduction

Neurosurgery clinic is one of the clinics where the patient has been bedridden for a long time and cannot perform some of daily life activities without assistance from another person. Especially with the patients who had a brain hemorrhage or had a brain tumors surgery,

constipation may increase intracranial pressure and it constitutes an important problem. Postponing the necessity of defecation due to being in hospital environment, eating food which is low in fiber, disorders in eating or in mobility related to the change of level of consciousness, neurological problems which affect the nerve conduction (spinal cord injuries, spinal tumors, cerebrovascular

diseases etc.) or diseases which limit mobility such as Parkinson's or multiple sclerosis as well as some drugs (antidepressants, anti-parkinsonians, diuretics) can cause constipation in patients hospitalized in these clinics.

Constipation is a problem typical for gastrointestinal system and characterized by difficult or less frequent bowel movements [1]. Constipation can be defined in relation to the usual defecation habits of the individual, the volume of defecation (harder and drier than usual) and the number of defecation (less frequent than usual). Although the symptoms and indications of constipation may vary according with the individual, it is generally characterized with defecation less frequent than twice a week, excessive straining while passing and defecating the stool and not fully excreting the stool [2–7].

When gastrointestinal system works effectively, the colonic transit of the food intake lasts from 20 to 56 hours. Normally feces consist of 75% of water and 25% of solid matter [2,4]. Slow movement of stool in bowels, a longer stay in bowels or the absorption of water in stool generate the occurrence of constipation. Another characteristic of stool is its smaller quantity. Changing according to the society, individual or diet, the average amount of stool is 100–200 grams daily. Daily stool amount below 35 grams, straining during 25% of the time spent in toilet and the longer period of stay in the bowel are among the symptoms of constipation [1,8].

Constipation is not an illness but a symptom. There are numerous factors generating this symptom. Genetic characteristics, age, gender, immobility, low intake of calories, diseases, low income and poor education, psychological conditions (anxiety, depression, physical or sexual trauma), loss, postponing or suppression of the need to defecate, travelling; mechanical, endocrine or neurological causes and drugs are among these factors [6,8,9]. Constipation affects 9% of children and 12–19% of adults [8,10]. In the USA, 10% of the population, 20% of individuals in nursing and care rehabilitation centers, 49% of individuals in long term care and rehabilitation houses and 70% of individuals who have a learning disability or disabled individuals are confronted with the constipation problem [1]. It is more frequent in women, people who have a chronic disease or restraint in diet, old and immobile individuals, people who have lower education and income level as well as those sexually abused and also people who have psychological disorders such as depression [8,11,12].

Constipation and its symptoms have a visible effect on the quality of life in individuals, social life and daily activities. Both the physical and psychological characteristics of the individual are negatively affected due to long-term constipation. In addition, constipation can lead to a headache, fatigue, distention, decrease in/loss of appetite, nausea or vomiting. Constipation may also

trigger other symptoms such as extremity spasticity or bladder dysfunctions [9,13].

When constipation and its symptoms are taken into account, constipation is vitally important for the patient population particularly in neurosurgery clinics [6].

Assessment of Constipation in Neurosurgical Patients

Assessment is a period of time when data about patients are systematically and continuously collected, verified and organized. These data reflect how wellness is improved thanks to the applications which improve health or how health is destroyed because of an injury or illness [14].

Assessment of constipation is highly important in neurosurgical patients. Various neurological, spinal cord injuries etc. or diseases may result in constipation. In addition, neurosurgical nurse should be informed that bowel tumours can develop as a secondary problem to constipation and they should follow the patient. For this reason, neurosurgical nurses have an important place in the assessment and prevention of constipation [15,16]. Caring and treatment of constipation is a problem which nurses need to allocate extra time in addition to the diseases in neurosurgery or surgeries. In England, nurses allocate 10% of their time to constipation [17].

Assessment of constipation includes taking the nursing history, physical diagnosis of abdominal area, evaluating the characteristics of stool, examining radiological and laboratory tests helping the diagnosis [18]. Assessment of what is normal in neurosurgical patient is highly important in creating a personal care in the period of diagnosis.

Nursing History

The nurse should take the nursing history while paying attention to the patient's uniqueness and distinctiveness. The interrogation of constipation in neurosurgical patients should include the steps below.

- Determining dietary habits, when and how often the patient defecate,
- Dietary history (the patient eats fruit, vegetables, high-fiber food, follows a well-balanced diet etc.),
- The appetite (change in dietary habits and weight, unwilling loss of weight),
- Daily liquid intake (quantity and type),
- Pain and blood/mucus related to bowel movements,
- Hard, loose or watery stool, its colour and the existence of blood or mucus,

- Symptoms, such as anorexia, nausea, vomiting, distention and abdominal pain,
- Use of subsidiary methods for defecation (enema, laxatives, etc.),
- Whether or not there is bowel diversion (the frequency of defecation, the characteristics of stool, the condition of stoma and the package used etc.),
- Gastrointestinal system disorders, surgical interventions (whether there has been colon cancer in the history in the family, etc. and anorectal pathologies,
- Anatomic malformations, metabolically and gastrointestinal diseases (hirschsprung disease, hypothyroid, hypercalcemia, diabete mellitus), neuropathic conditions (spinal cord anomalies or trauma, neurofibromatosis), intestinal nerve and muscle diseases (intestinal neuronal dysplasia, visceral myopathy),
- Use of drugs (laxatives, antacids, analgesic, ferrous drugs, etc.),
- Mobility (daily exercise and type),
- Pain and in discomfort (abdominal or anal pain history, type, severity and location),
- Problems of reaching toilet [7,9,18].

Physical Examination

Abdominal sounds should be used to determine bowel movements. It is very important to listen to abdominal noise to eliminate intestinal obstruction. Abdominal sounds are mostly heard from right lower quadrant. Abdomen needs to be palpated for abdominal mass, sensitiveness and distention [19].

Examining Stool

Normally feces consist in 75% of water and in 25% of solid matter. Solid matter is made of undigested food, dead bacteria, fat, bile pigments and cells in mucosa of the small intestine. Colour and texture of stool can change related to the diseases and drugs used. Stool is very hard and dry in constipation. The nurse can make use of charts including stool pictures in order to diagnose the texture, volume and type of stool [15].

Diagnostic Tests

There are various types of radiological tests: abdominal graphy, upper gastrointestinal system (UGS) baric graphy, ultrasound, double contrast baric graphy, colonoscopy, anorectal manometry, Magnetic resonance imaging (MRI) and defecography [7,17,20].

Laboratory Tests

Underlying causes should be investigated because hypercalcemia, hyperglycemia and hypothyroid are among the causes of constipation.

Apart from these diagnoses and tests, there are many validity and reliability proven scales used in diagnosis of constipation in literature. Rome III Criteria, Bristol Stool Form Scale, Constipation Risk Assessment Scale (CRAS), Constipation Severity Instrument (CSI) and Patient Assessment of Constipation Quality of Life (PAC-QOL) are frequently used by neurosurgical nurses in clinics [17,21–23].

Rome III Criteria

In order to create a standard in assessment of constipation, Rome I, Rome II, Rome III criteria are determined by Rome committee. According to Rome I criteria, the symptoms of constipation should be continuous and repetitive for at least three months whereas in Rome II criteria, the symptoms should be occurant within the period of last 12 months for at least 12 weeks. In addition, there were attempts aiming at defining constipation for babies, children and adults. In May 2006, it was accepted in the criteria of Rome III that the symptoms of constipation should have started at least 6 month before the diagnosis and it should reoccur for three months, three or more times a month. However Rome II and Rome III are the most commonly used criteria [4,24,25].

Bristol Stool Form Scale

Developed by a group of gastroenterologists at Bristol University in England, Bristol Stool Form Scale is used to evaluate the shape of stool and follow the changes in bowel habits. This scale is designed to classify the bowel movements of an individual in seven different categories. According to Bristol Stool Form Scale, Type 1 and Type 2 “constipation”, Type 3 and Type 4 “normal defecation”, Type 5, Type 6 and Type 7 stands for “diarrhea”. It is accepted that there is a direct correlation between the form of stool and the period of time it stays in the bowel [26].

Constipation Risk Assessment Scale (CRAS)

Developed by Richmond (2006) to assess the risk of constipation, the validity and reliability of the scale is enabled in Turkish by Koca et al. (2009) [22,23]. The Chronbach’s alpha value of the scale is 0.50. According

to the total of the scale, the constipation risk can be defined as “low”, “normal” or “high”. When the total is high, it shows that there is a huge risk of constipation.

Constipation Severity Instrument (CSI)

It is developed to determine the frequency and volume of defecation and how hard it is to defecate for the patient by Varma et al. (2008) [27]. There are 16 questions in the scale. CSI has three subdimensions: Obstructive Defecation (OD), Colonic Inertia (CI) and Pain. The points receivable from OD are between 0–28, from CI subdimension are between 0–29, from Pain subdimension are between 0–16. The lowest point receivable from CSI is minimum 0, maximum 73. High points indicate the symptoms are severe [27,28,29]. It is stated in the studies that test-retest correlation parameters of CSI are 0.20–0.84 in every medium of the test; substance-total point correlation is 0.40–0.82 and Cronbach’s alpha value is 0.91–0.93 [27,28].

Patient Assessment of Constipation Quality of Life (PAC-QOL)

The scale is developed in order to determine the effect of constipation to the quality of life by Marquis et al. (2005) [21]. PAC-QOL is a 28-subject self-evaluation scale consisting of five subscales: ‘anxiety’ (11 subjects), ‘physical discomfort’ (4 subjects), ‘psychosocial discomfort’ (8 subjects) and ‘satisfaction’ (5 subjects). Maximum number of points to receive from five point-scale is 140, minimum is 28. As the points received from the scale increase, the quality of life is considered to be negatively affected [28,29]. In research, PAC-QOL’s Cronbach alpha parameter is 0.91, Cronbach alpha parameter in every subscale is between 0.76–0.88 and test-retest reliability of the scale is $r=0.96$ [10,21].

Prevention and Treatment of Constipation in Neurosurgical Patients

Neurosurgical nurse should plan nursing interventions to neurosurgical patient and try to prevent constipation [19].

Increasing the Intake of Liquid

Human bodies are made up in 55–70% of water according to our level of muscles. Demand for water can also be satisfied with non-alcoholic beverages (fruit juice, tea, herbal tea, lemonade, beverages without soda, milk, diluted yogurt drink etc.) and juicy food (soup,

oranges, melons, watermelons, tomatoes, lettuce and cucumber etc.) [30].

There is a variety of information about the amount of liquids for the nursing and treatment of constipation according to findings of studies in literature. Without laboratory proven dehydration, there is no sufficient evidence of the fact that only the increase of liquid intake can be successful in treatment of constipation [24,31–33].

Intake of liquids is controlled by dehydration mechanism and if there is more demand for water, it is indicated. Dehydration results in the decrease in blood plasma and water content. This situation creates an osmotic difference between capillary vessels in mucosa of intestines. Mucosa cells in intestinal liquid move the water they cause from intestinal cell liquid to the capillary vessels. This process creates an osmotic difference between intestinal cell liquids and liquid is left in intestinal lumen. Later, water is moved to intestinal liquid and mucosa cells to intestinal lumen. As a result, there is hard and dry stool [33]. It is advised to consume at least 1.5 liters of water daily to prevent constipation [19].

High Fiber Food/Increasing the Intake of Fiber

Fibers are one of the basic edible parts of plants which totally or partially resist digestion and absorption and ferment totally or partially in large intestines. It is necessary to take optimum 20–30 grams of fiber daily [34]. The period of time when the fiber passes the intestine has an effect on short chain fat acids production, the volume of intestines, production of wind, digestion of proteins, cholesterol and other lipid metabolisms. Water insoluble fiber has positive effects on the intestinal moves and the period of time when fiber passes the intestine. Fecal mass increases and the period of excretion decreases thanks to increased intake of fibers in diet. Furthermore, inadequate intake of fiber can lead to constipation [34]. The main reason for the increase in stool is because of the nature of fibers which bind water. Fibers increase the volume of stool and the amount of water and therefore relieve the patient and this situation helps prevent constipation.

When managing constipation, it is advised to increase high-fiber food but there is not adequate proof what effects this change of lifestyle has. Fibers are added to the content of stool and enable it to have a form. In addition, it increases the width of wall of intestines, triggers pushing activity and fastens the excretion period.

In Ducas et al.’s prospective study (2003) carried out on 3327 women, it is found that the symptoms of subjective constipation is decreased when daily intake of fibers are increased (20 gram/per day). Furthermore, it is found that the randomized controlled research on this topic are limited [33].

In particular when the deficiency of fiber is a high risk factor, neurosurgery patients should be given a high-fiber diet and constipation should be prevented [24,32,33].

Physical Activity

Physical activity increases peristalsis of intestines and helps stool move in the intestines. Neurosurgical patients should be encouraged by the nurse to perform their daily life activities such as moving around, maintaining personal hygiene and dressing independently as far as it is possible. This way the patient is made to move and it helps the stool move in the intestines which prevents the occurrence of constipation.

Immobility is related to constipation. It has been found that physical activity affects the quality of life positively. Physical activity should be adjusted according to the disease of the patient, type of the surgery, chronic diseases, whether or not there is a restriction of mobility, physical capacity and general health condition. The neurosurgery patients who are able to move independently are advised to walk every day or every two days for 15–20 minutes according to their tolerance level when it is not undesirable [19].

Exercise

Exercise is a physical activity applied to maintain the physical condition of the body or keeping it fit, to improve health or a therapeutic initiative. An exercise program created for neurosurgical patients is adjusted according to the surgical initiative type as well as their ability and it consists of activities such as active/passive movements, pushing and pulling exercise. This way, constipation can be prevented [36,37].

There is an increase in bowel movements when exercised regularly. An immobile patient who cannot exercise has slow bowel movements, constipation, inadequate defecation reflexes, flatulence or inability in excreting feces from the body [34,36,37].

Intestines work faster in the morning and after having meals. Therefore, the fastest bowel movements occur after waking up or in the first two hours after having meals. Taking advantage of the physiological phenomena which increases bowel movements, in this period of time nurses should encourage neurosurgical patients to exercise (Satish 2009). In addition, the patients who cannot walk or are confined to bed are advised to exercise in bed (Range of Motion). The exercise should be performed for 15–20 minutes at least twice a day [19].

In Kyle's research (2011), a correlation between immobile individuals and bowel functions. In a 12 weeks' study carried out on middle-aged individuals with con-

stipation, it was found that regular physical activity decreased total intestine and rectosigmoid transit period to a considerable extent and yielded positive results [38].

Regular Toilet Behaviors

Postponing the need to excrete or not paying due attention to it, results in the occurrence of constipation. Having a regular toilet behaviour is highly important in preventing constipation. Neurosurgery patients with constipation problem are advised to spend 5–15 minutes in the toilet after the meals and the breakfast when gastrocolic reflex is the most efficient. Such a habit makes evacuation of intestines easy [19].

Pharmacological Treatment

Laxatives

These are local drugs which stimulate the desire to defecate and increase intestine peristalsis and soften the substance in intestines as well as make defecation easy. Laxatives are the most frequently used pharmacological agents in the treatment of constipation. Nowadays, laxatives which create volume, stimulant laxatives and osmotic laxatives are among the most commonly used laxative types [8,24,25,33,34,39].

Enema

In this process, limited and sufficient quantity of liquids are provided to large intestines through rectum and sigmoid colon to stir peristalsis of intestines, soften the stool and ease its evacuation. The liquid given increases the movement in intestines with the pressure it makes while entering rectum and intestines and it stimulates the muscles inside the bowels and the nerve endings. What is more, the amount of water disjoints the feces bulks, spreads them and smears it to the side walls of the rectum. The type or quantity of water stimulates the wall of the rectum and starts the reflex to defecate. When intestines contraction starts, feces are evacuated with strong peristaltic movements. The most obvious reason for applying enemata is to prevent constipation. Other reasons are to evacuate stool in intestines in order to do X-ray examinations, endoscopy, surgery as well as giving birth or as a part of a program to treat the intestines [5].

Suppositories

Suppositories are solid or semi-solid forms of drugs in different forms, found in room temperatures, can melt in body temperature or smashes in the body parts applied which can be used in rectum [38]. Suppositories are used in situations when there is no result obtained with oral laxatives or when the movement of intestines needs to be accelerated. Suppositories can be solely used or combined with oral laxatives [33].

Conclusion

Constipation is a serious symptom in neurosurgical patients. The nurse has an important role in diagnosis and prevention of constipation. Without treatment, constipation can lead to extra problems for both the patient as well as for the medical staff. There are limited nursing and treatment opportunities of constipation because the pathophysiology and the intestinal physiology are complicated. For this reason the neurosurgical nurse who supplies 24 hours' health care service to the patient and his/her family should diagnose constipation, have knowledge about risk factors, prevent constipation and follow neurosurgical patient about constipation. To this extent:

- Nurses should reconsider their knowledge and abilities about constipation in the scope of changing technology and its application,
- Evidence based on research should be made about diagnosis and prevention of constipation and needs to be effectively applied in clinical field,
- The valid and reliable scales should be applied actively by nurses and patients,
- Pharmacological or non-pharmacological methods related to constipation should be supported with experimental research and used in clinical fields.

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