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Model of nursing care for patients with Brugada syndrome according to the international ICNP®

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Abstract

Introduction

Brugada syndrome is a rare disease involving genetic disorders of heart rhythm. The disease was discovered in 1992 by the Brugada brothers, Spanish cardiologists. This syndrome occurs with sporadic frequency in families with 5-66/10,000 affected worldwide, and 12/10,000 affected in Asia. Usually, the disease affects people between the age of 30 and 50 years of age. Brugada syndrome is responsible for 4-12% of all sudden cardiac arrests, and 20% of sudden cardiac arrest patients who have never had organic cardiovascular disease. The pathomechanism of this syndrome is not fully understood, but three types of factors can be distinguished: genetic, hormonal and environmental. The most common mutation causing Brugada Syndrome is the mutation of SCN5A gene. Brugada syndrome is characterized by the occurrence of syncope episodes and pre-osmotic states along with sudden cardiac arrest, which is a result of ventricular arrhythmias. The basis for the diagnosis of Brugada syndrome is the use of a 12-lead ECG and in some cases, pharmacological diagnosis, consisting of simultaneous monitoring of ECG and administration of a class I antiarrhythmic drug according to Vaughan-Williams classification. Treatment of Brugada syndrome consists of implantation of a cardioverted-defibrillator (ICD) in accordance with criteria (I, IIa and IIb), based, inter alia, on the patient's state of health and course of cardiovascular arrest. Prognosis in asymptomatic patients is largely positive.

Aim

The aim of the study was to use the international ICNP® classification when presenting the problems in nursing care in patients with Brugada syndrome.

Materials and Methods

The nursing care model based on the international ICNP® classification was used. The diagnoses were based on symptoms and problems of patients with Brugada syndrome.

Summary

Although the Brugada syndrome is a rare disease entity, it should be taken into account when differentiating other factors which may lead to sudden cardiac arrest. Due to prodromal nonspecific symptoms, care should be taken into accurately diagnosing with 12-lead ECGs. The most common problems in patients with Brugada syndrome are palpitations (frequently occurring at night), fainting, and at the same time risk of falling and chest pain. Healthcare professionals caring for patients with Brugada syndrome should observe the patient for the first signs of fainting, prioritizing safety.

Conclusions

Brugada syndrome is a rare disease with nonspecific symptoms, which is why accurate diagnostic methods, including primarily tech 12-lead ECG are of great importance. Diagnostics, along with appropriate education of the patient and their families, allow effective care and prevention against the occurrence of negative effects of this disease.

Keywords Brugada syndrome, nursing process, ICNP, syncope, ECG

Introduction

Brugada syndrome is a rare disease belonging to genetic disorders of heart rhythm. This syndrome is unusual as the first specific symptom is the occurrence of dangerous ventricular arrhythmias in people otherwise considered healthy. The syndrome was discovered by the brothers Brugada – Spanish cardiologists in 1992. Thanks to characteristic ECG changes and episodes of loss of consciousness, they noticed a syndrome which was not described up until then. [4]

The syndrome can be described as familial and sporadic, with a frequency of only 5-66/10,000 worldwide and 12/10,000 in southeast Asia [2]. Men are affected more often, and can constitute as much as 80% of diseased patients in adult populations. In children, incidence of disease is generally equal in both sexes. The disease usually affects persons between 30 and 50 years of age. Brugada syndrome is responsible for 4-12% of all sudden cardiac arrests, and 20% of sudden cardiac arrests in patients who have never had a cardiac disease.
The pathophysiology of this syndrome is unknown, however three types of factors have been distinguished: genetic, hormonal and environmental. The most common mutation causing Brugada syndrome is the mutation of gene SCN5A, which encodes the alpha protein subunit, responsible for sodium channel regulation. Other mutation which are less frequent are mutations of the CACNA1C gene. These are responsible for 35% of cases of Brugada syndrome. An increase in testosterone was observed in the group of men suffering from this syndrome. So far, discussions have been ongoing and the impact of testosterone on Brugada syndrome is currently being researched. Men with Brugada syndrome generally have a lower BMI and percentage of body fat compared to the general population. The basic mechanism leading to arrhythmias is called "Re-entry". It arises from dispersion of myocardial repolarization.
Brugada syndrome is characterized by episodes of dizziness, fainting and pre-osmosis along with sudden cardiac arrest, which occurs as a result of ventricular arrhythmias (polymorphic ventricular tachycardia and ventricular fibrillation). Other symptoms do not usually occur. Often, the first symptom is sudden cardiac arrest, which follows an unidentified loss of consciousness. Other symptoms may include palpitations, chest pains, arrhythmia (mainly at night) and agonal respiration. Frequently, arrhythmias are supraventricular. [2] [4]

The basis for diagnosis of Brugada syndrome is a 12-lead ECG and administration of class I antiarrhythmic drugs according to the Vaughan – Williams classification. Other studies such as peripheral blood counts and imaging (CT, MRI) are used only for differentiation between syncope, pre-flinating conditions and sudden cardiac arrest. ECG changes in this disease are:
Type 1: "Buckling" consisting of elevation of the ST segment at least 2mm and a negative T wave in leads V1-V3;
Type 2: "Saddle" consisting of election of ST segment in V1-V3 and a positive or biphasic T wave;
Type 3; consisting of elevation of ST segment in leads V1-V3 up to 1mm regardless of morphology
The pharmacological test consists of administration of antiarrhythmatics at a dose of 1mg/kg or procainamide at a dose of 10mg/kg. The sample is positive when type 2 and 3 ECG convert to type 1 or J point is at least 0.2mV above the state before antiarrhythmic drug was administered.
The only possible treatment of Brugada syndrome, simultaneously preventing sudden cardiac death, is the implantation of a defibrillator for cardioversion (ICD). [7]. In patients after cardiac arrest, ICD implantation are attributed to class I. Patients who did not have cardiac arrest but had symptoms and during stimulation ventricular tachycardia was induced, are classified at class IIa. However, patients who do not have symptoms but during stimulation showed ventricular tachycardia and have a positive pharmacological test result, are qualified to class IIb.
The prognosis in asymptomatic patients, according to interpretation of other authors, is good.
However, it should be remembered that often the only clinical symptom of Brugada syndrome is sudden cardiac arrest, which can only be prevented by ICD implantation. [8]

Aim

The aim of this study is to use the international classification of ICNP® to show problems related to care of Brugada syndrome and to present the diagnostic and therapeutic process of the above mentioned disease.

Materials and methods

After analysis of various research and scientific papers on Brugada syndrome and the care problems associated, a care plan has been proposed. This plan was based on the ICNP reference terminology. Diagnoses were selected and nursing intervention that were compatible with the symptoms and problems found in the Brugada syndrome.

Diagnoses were described using a 7-axis model. It applies to three aspects: phenomena, actions and result. The basis for the use of the classification is the use of the 7th axis where the phenomenon is of interest. Classification consists of forming sentences by adding "sub-sentences" from different axes. The names of each axis differ from each other depending on whether the classification concerns the phenomena or action/activity. [1][5]

Nursing process using the 7-axis ICNP model [3][5][6]

International Classification of Nursing Practices (ICNP®) is an international standard for nursing terminology with multi-axis structure.

Diagnosis 1: Impaired Cardiovascular System [10022949]

Interventions:

- Administering Medication And Solution [10001804];
- Diagnostic Testing [10031140];
- Monitoring Blood Pressure [10032052]

- Monitoring Response To Treatment [10032109]
- Monitoring Respiratory Status [10012196]
- Monitoring Blood Glucose [10032034]
- Monitoring Cardiac Status [10034285]
- Monitoring Body Temperature [10012165]
- Monitoring Laboratory Result [10032099]
- Assessing Cardiac Status [10036738]
- Assessing Tobacco Use [10038606]
- Promoting Self Management Of Symptom [10038469]
- Collaborating With Physician [10023565]
- Managing Symptom [10031965]

- Managing Specimen [10011687] (+term from the F axis - Blood [10003319])

Results: Teaching Relaxation Technique [10038699]

Diagnosis 2: Arrhythmia[10002536]

Interventions:

- Monitoring Vital Signs [10032113]
- Monitoring Cardiac Status [10034285]
- Assessing Cardiac Status Using Monitoring Device [10002706]
- Encouraging Rest [10041415]

Results: Heart Rate Within Normal Limits [10029229]; Blood Pressure Within Normal Limits [10027647]

Diagnosis 3: Altered Blood Pressure [10022954]
Interventions:
- Administering Medication [10025444]
- Monitoring Blood Pressure [10032052]
- Monitoring Response To Treatment [10032109]
- Measuring Blood Pressure [10031996]

Results: Blood Pressure Within Normal Limits [10027647]

Diagnosis 4: Pain [10023130] (+ term from axis: localization - chest [10019692])
Interventions:
- Administering Pain Medication [10023084]
- Identifying Attitude Toward Pain [10009654]
- Implementing Pain Guideline [10009872]
- Consulting For Pain Management [10024331]
- Pain Control [10025831]
- Nurse Controlled Analgesia [10039798]
- Monitoring Risk For Negative Response To Nurse-Controlled Analgesia [10039896]
- Monitoring Cardiac Status [10034285]
- Teaching About Managing Pain [10019489]
- Assessing Pain [10026119]
- Palliating [10013984]
- Collaborating In Initiating Patient Controlled Analgesia [10004561]
- Collaborating In Initiating Nurse Controlled Analgesia [10039812]
- Collaborating With Physician [10023565]
- Managing Symptom [10031965]

Results: Reduced Pain [10027917]

Diagnosis 5: Dizzines [10006160]
Interventions:
- Monitoring Blood Pressure [10032052]
- Monitoring Respiratory Status [10012196]
- Monitoring Blood Glucose [10032034]
- Monitoring Cardiac Status [10034285]
- Promoting Self-Management Of Symptom [10038469]
- Assessing Dizzines [10045917]
- Collaborating With Physician [10023565]
- Managing Symptom [10031965]

Results: No Fall-Related Injury [10038545]

Diagnosis 6: Risk Of Fall[10015122]
Interventions:
- Monitoring Blood Pressure [10032052]
- Monitoring Respiratory Status [10012196]
- Monitoring Blood Glucose [10032034]
- Monitoring Cardiac Status [10034285]
- Promoting Self-Management Of Symptom [10038469]
- Assessing Mobility [10030527]

- Assessing Balance [10037457]
- Assessing Risk For Falls On Admission [10037435]
- Assessing Housing Condition[10030625]
- Assessing The Knowledge Of Falls Prevention [100399780]
- Assessing Dizzines [10045917]
- Collaborating With Physician [10023565]
- Managing Symptom [10031965]

Results: No Fall [10034704] or Fall [10029405]

Summary

Despite the fact that Brugada syndrome is a rare disease entity, it should be taken into account when differentiating with other causes that may lead to sudden cardiac arrest. Due to prodromal nonspecific symptoms accurratic diagnostic methods are essential, including a 12-lead ECG. However, it is also important to regularly measure the vital parameters of the patient and to introduce pain therapy when chest pain is observed. In addition, patients should be monitored for anginal pain, which could lead to cardiac arrest. [2]][4]
The most common problems in patients with Brugada syndrome are palpitations (mostly at night), fainting, risk of falling and chest pain. [2]

People caring for patients with Brugada syndrome should observe the patient for initial signs of fainting, therefore ensuring safety. This person should have knowledge of the symptoms of cardiac arrest, which is inter alia, loss of consciousness, to be able to react early and call for help

Conclusions

1. All patients should have a 12-lead ECG to detect rare conditions, including Brugada syndrome.
2. Due to the non-specificity of symptoms, a thorough diagnosis should be performed, differentiating Brugada syndrome with other disease entities with similar symptoms.
3. Taking into account the non-specificity of symptoms, care should be taken to educate the patient and his/her carers so that they are able to detect the threat early.
4. A nurse caring for a patient with Brugada syndrome should pay attention to the occurrence of syncope, due to the risk of falling down and the use of pain therapy in case of pain, which will significantly improve quality of life of the patient.
5. The standard of care and conduct will facilitate patient monitoring and care planning.

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