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Knowledge of ataxia among the nurses regarding patients with behavioural problems at Teerathanker Mahaveer hospital and research centre, Moradabad UP problem solving approach

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Abstract

Introduction: Ataxia is a condition where a person lacks coordination during voluntary movement. He walks with an unstable gait and loses balance. His trunk may sway from side-to-side. He may show symptoms like slurring of speech, involuntary eye movements, difficulty with swallowing and tremor with movement. Damage, degeneration or loss of nerve cells in the part of your brain that controls muscle coordination (cerebellum), results in ataxia. Diseases that damage the spinal cord and peripheral nerves that connect your cerebellum to your muscles also may cause ataxia. Ataxia causes include:- Head trauma, Stroke, Transient ischemic attack (TIA), Cerebral palsy, Multiple sclerosis (MS), Chickenpox, Par neoplastic syndromes, Tumour, Toxic reaction, Vitamin E or vitamin B-12 deficiency,

Purpose: To reduce the risk of ataxia among the patients and to improve the health of the patients.

Objectives: To assess the knowledge of staff nurses regarding the side effects of the drugs.

Problem Solving Approach: The process of working through details of a problem to reach a solution. Problem solving may include mathematical or systematic operations and can be a gauge of an individual's critical thinking skills. Thus it helps to generate new possible solutions of knowledge which is necessary to solve the problem. The problem solving approach has following steps.

1. Problem identification
2. Data collection
3. Generation of solution
4. Selecting a solution
5. Implementing the selected solution
6. Evaluating a problem solution

Keywords: knowledge, coordination, chickenpox, ataxia

Introduction

Ataxia is a condition where a person lacks coordination during voluntary movement. He walks with an unstable gait and loses balance. His trunk may sway from side-to-side. He may show symptoms like slurring of speech, involuntary eye movements, difficulty with swallowing and tremor with movement.

Damage, degeneration or loss of nerve cells in the part of your brain that controls muscle coordination (cerebellum), results in ataxia. Your cerebellum comprises two pingpong-ball-sized portions of folded tissue situated at the base of your brain near your brainstem. The right side of your cerebellum controls coordination on the right side of your body; the left side of your cerebellum controls coordination on the left.

Diseases that damage the spinal cord and peripheral nerves that connect your cerebellum to your muscles also may cause ataxia. Ataxia causes include:

- Head trauma: Damage to your brain or spinal cord from a blow to your head, such as might occur in a car accident, can cause sudden-onset ataxia, also known as acute cerebellar ataxia.
- Stroke: When the blood supply to a part of your brain is interrupted or severely reduced, depriving brain tissue of oxygen and nutrients, brain cells die.
- Transient ischemic attack (TIA): Caused by a temporary decrease in blood supply to part of your brain, most TIAs last only a few minutes. Loss of coordination and other signs and symptoms of a TIA are temporary.
- Cerebral palsy: This is a general term for a group of disorders caused by damage to a child's brain during early development - before, during or shortly after birth — that affects the child's ability to coordinate body movements.
- Multiple sclerosis (MS): MS is a chronic, potentially debilitating disease that affects your central nervous system.
- Chickenpox: Ataxia can be an uncommon complication of chickenpox and other viral infections. It may appear in the healing stages of the infection and last for days or weeks. Normally, the ataxia resolves over time.
- Paraneoplastic syndromes: These are rare, degenerative disorders triggered by your immune system's response to a

cancerous tumor (neoplasm), most commonly from lung, ovarian, breast or lymphatic cancer. Ataxia may appear months or years before the cancer is diagnosed.
- Tumor: A growth on the brain, cancerous (malignant) or noncancerous (benign), can damage the cerebellum.
- Toxic reaction: Ataxia is a potential side effect of certain medications, especially barbiturates, such as phenobarbital, and sedatives, such as benzodiazepines. Alcohol and drug intoxication; heavy metal poisoning, such as from lead or mercury; and solvent poisoning, such as from paint thinner, also can cause ataxia.
- Vitamin E or vitamin B-12 deficiency: Not getting enough vitamin E or vitamin B-12, because of the inability to absorb enough of the vitamin or other reasons, can lead to ataxia.

For some adults who develop sporadic ataxia, no specific cause can be found. This is known as sporadic degenerative ataxia, which can take a number of forms, including multiple system atrophy, a progressive, degenerative disorder.

Hereditary Ataxias

Some types of ataxia and some conditions that cause ataxia are hereditary. If you have one of these conditions, you were born with a defect in a certain gene that makes abnormal proteins. The abnormal proteins hamper the function of nerve cells, primarily in your cerebellum and spinal cord, and cause them to degenerate. As the disease progresses, coordination problems worsen.

You can inherit a genetic ataxia from either a dominant gene from one parent (autosomal dominant disorder) or a recessive gene from each parent (autosomal recessive disorder). In the latter case, it's possible neither parent has the disorder (silent mutation), so there may be no obvious family history.

Different gene defects cause different types of ataxia, most of which are progressive. Each type causes poor coordination, but each has specific signs and symptoms.

Autosomal dominant ataxias

These include

- Spinocerebellar ataxias: Researchers have labeled more than 20 autosomal dominant ataxia genes, and the number is likely to continue to grow. Cerebellar ataxia and cerebellar degeneration are common to all types, but other signs and symptoms, as well as age of onset, differ depending on the specific gene mutation.
- Episodic ataxia: There are seven recognized types of ataxia that are episodic rather than progressive - EA1 through EA7. EA1 and EA2 are the most common. EA1 involves brief ataxic episodes that may last seconds or minutes. The episodes are triggered by stress, being startled or sudden movement, and often are associated with muscle twitching.

EA2 involves longer episodes, usually lasting from 30 minutes to six hours that also are triggered by stress. With this type of ataxia, you may experience dizziness (vertigo), fatigue and muscle weakness during your episodes. In some cases of episodic ataxia, symptoms resolve in later life.

Episodic ataxia doesn't shorten life span, and symptoms may respond to medication.

Autosomal recessive ataxias

These Include

- Friedreich's ataxia: This, the most common hereditary ataxia, involves damage to your cerebellum, spinal cord and peripheral nerves. Peripheral nerves carry signals from your brain and spinal cord to your muscles. In most cases, signs and symptoms appear before the age of 25.
  The rate of disease progression varies. The first indication generally is difficulty walking (gait ataxia). The condition typically progresses to the arms and trunk. Muscles weaken and waste away over time, causing deformities, particularly in your feet, lower legs and hands.
  Other signs and symptoms that may develop as the disease progresses include slow, slurred speech (dysarthria); fatigue; rapid, involuntary eye movements (nystagmus); spinal curvature (scoliosis); hearing loss; and heart disease, including heart enlargement (cardiomyopathy) and heart failure.
- Ataxia-telangiectasia: This rare, progressive childhood disease causes degeneration in the brain and other body systems. The disease causes immune system breakdown (immunodeficiency disease), which increases susceptibility to other diseases. It affects various organs.
  Telangiectasias are tiny red "spider" veins that may appear in the corners of your child's eyes or on the ears and cheeks. Although they're charact*e*ristic of the disease, your child may not develop them. Delayed motor skill development, poor balance and slurred speech are typically the first indications of the disease. Recurrent sinus and respiratory infections are common.
  Children with ataxia-telangiectasia are at high risk of developing cancer, particularly leukemia or lymphoma. Most people with the disease need a wheelchair by their teens and die in their teens or early 20s.
- Congenital cerebellar ataxia: This type of ataxia results from damage to the cerebellum that's present at birth.
- Wilson disease: People with this condition accumulate copper in their brains, livers and other organs, which can cause neurological problems, including ataxia.

During the clinical posting the investigator observed that the patient in psychiatric ward having ataxia. This is motivates the investigator to select this problem.

Background of the study

History

How long has it been present and did it begin all of sudden? These are common questions in neurology and help distinguish chronic and slowly progressive problems (such as degenerative diseases like Parkinson disease) from acute problems (like stroke).

When does it occur? It is important to note the circumstances under which the patient's gait is notably abnormal. For example, if walking on irregular surfaces or in the dark markedly worsens the patient’s gait, sensory ataxia should be a major consideration.

Are there any coexisting symptoms? These may include vertigo, weakness, stiffness or slowness of movement, abnormal movements, cognitive difficulties or significant changes in behaviour. These can be clues to vestibular,

cerebellar, pyramidal, and extrapyramidal or frontal lobe disorders. Feelings of presyncope may require evaluation of factors potentially affecting blood flow to the brain.

What have been the functional ramifications of the gait disturbace? For example, has the patient fallen and, if so, in what situations? What has the patient or family done to prevent falls (i.e., restrict movements, etc).

Is the gait disturbance completely explainable by pain (such as a limp), or by compensation for weakness of a single muscle group? If it is due to weakness, evaluation of this symptom will be the most important factor.

Is the gait disturbance real and have others noticed it? This is important because ataxia can be hysterical in nature. At times this can be recognized by the severity of the gait disturbance (which is often exaggerated and bizarre) and the relative paucity of injuries due to falls, etc. These patients often "catch themselves" in ways that would suggest higher levels of motor performance than their poor gait would indicate. Astasia-abasia is a term that has been applied to the condition in which the patient lurches wildly and only falls when there is someone or something to break the fall. The key to recognizing this is to realize that the ability to catch themselves exceeds that which would be expected of a patient with such severe gait disturbance.

Problem Statement

Knowledge of ataxia among the nurses regarding patients with behavioural problems at Teerathanker Mahaveer Hospital and Research Centre, Moradabad UP.

Purpose

- To reduce the risk of ataxia among the patients and to improve the health of the patients.

Objectives

1. To assess the knowledge of staff nurses regarding the side effects of the drugs.
2. To find out the best alternative for reducing the side effects.
3. To implement the best alternatives for reducing the side effects of the drugs.
4. To evaluate the effectiveness of the best alternatives.

Review of literature

Van Gaalen J, *et al*. (2014) [11], A study was conducted to identify all of the drugs that can have ataxia as an ADR and to assess the frequency of drug- induced ataxia for individual drugs. Drug induced ataxia was reported in association with 93 individual drugs (57 from the literature, 36 from the Dutch registry). The most common groups were antiepileptic drugs, benzodiazepines, and antineoplastic.

Roel A. Ophoff, Gisela M. Terwindt, *et al.* (1996) [11], This study was conducted on Familial Hemiplegic Migraine and Episodic Ataxia Type-2 Are Caused by Mutations in the Ca21 Channel Gene CACNL1A4. The result of this study is cDNA Sequence Eight cosmids, forming two small contigs in the FHM candidate region between markers D19S394 and D19S226, were subjected to exon trapping. They identified isolated the CACNL1A4 gene, in which we identified mutations in FHM and EA-2 patients, demon- strating these paroxysmal disorders to be allelic.

Yo-Tsen Liu, Joshua Hersheson *et al.* (2013) [10], this study was conducted on A novel homozygous frame shift mutation in ADCK3 was identified in both siblings. CoQ10 supplementation was initiated following these genetic and biochemical analyses She gained substantial improvement in myoclonic movements, ataxic gait and dysarthric speech after treatment. Result of this study is highlights the importance of diagnosing ADCK3 mutations and the potential benefit of treatment for patients. The identification of this new mutation broadens the phenotypic spectrum associated with ADCK3 mutations and provides further understanding of their pathogenic mechanism.

Kevin C. Kemp1, Amelia J. Cook, *et al.* (2016) [7], Purkinje cell pathology is a common finding in a range of inherited and acquired cerebellar disorders, Purkinje cells have an unparalleled resistance to insult and display unique regenerative capabilities within the central nervous system. Here present a pathological study showing novel and fundamental insights into Purkinje cell injury, remodelling and repair in Friedreich's ataxia; the most common inherited ataxia. Analysing post-mortem cerebellum tissue from patients who had Friedreich's ataxia, also shown a disease-related increase in the frequency of Purkinje cell fusion and heterokaryon formation in Friedreich's ataxia cases; with evidence that underlying levels of cerebellar inflammation influence heterokaryon formation. Here present a pathological study showing novel and fundamental insights into Purkinje cell injury, remodelling and spontaneous repair in FRDA.

James M. Dell'Orco, Aaron H. Wasserman, *et al*. (2015) [6], study was conducted on the. Mice used in the study include homozygous SCA1 [82Q] transgenic mice that overexpress mutant human ATXN1 in cerebellar Purkinje neurons under the Purkinje neuron-specific murine Pcp2 (L7) promoter, maintained on an FVB background. The Results is Initial loss of repetitive spiking is subsequently followed by restored spiking in SCA1 Purkinje neurons. Suggest that expression of ATXN1 [82Q] in Purkinje neurons causes an early membrane depolarization with relatively intact morphology, followed by Purkinje neuron atrophy and subsequent restoration of pacemaker firing.

Data Collection

To identify the level of knowledge on ataxia among the staff nurse in the Psychiatric ward at Teerthanker Mahaveer Hospital and Research Center, Moradabad.

The following assessment tools were constructed

Section I: Description of socio-demographic variables of staff nurse in the Psychiatric ward at Teerthanker Mahaveer Hospital and Research Center, Moradabad.

Section II: Structure questionnaire to assess the knowledge on ataxia.

Analysis of Data

Section I: Description of socio-demographic variables

This section baseline data of the sample was analyzed by using descriptive statistics and presented in terms of frequency, percentage and diagrams.

Table 1: Frequency and Percentage Distribution of Baseline characteristics of staff nurse.

S. no	Baseline characteristics	Frequency	Percentage (%)
1	Age in years		
	20-25	2	50
	26-30	2	50
	31-35	0	0
	Above 35	0	0
2	Gender		
	Male	3	75
	Female	1	25
3	Qualification of work		
	Diploma in Nursing	3	75
	Basic B.Sc Nursing	1	25
	Post Basic – B.Sc Nursing	0	0
	Post graduate in Nursing	0	0
4	Area of work		
	General (Psychiatric) ward	4	100
	ICU	0	0
	Emergency	0	0
	OPD	0	0
5	Experience in years		
	0-2	2	50
	3-5	2	50
	6-8	0	0
	Above 8 year	0	0

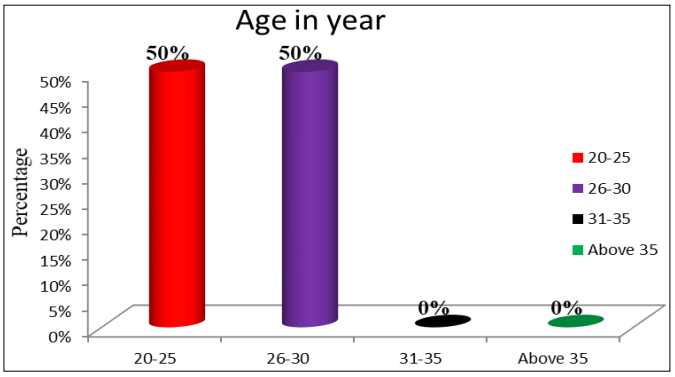

Fig 1(a): Bardiagram representing percentage distribution of Age in year regarding Ataxia among staff nurse.

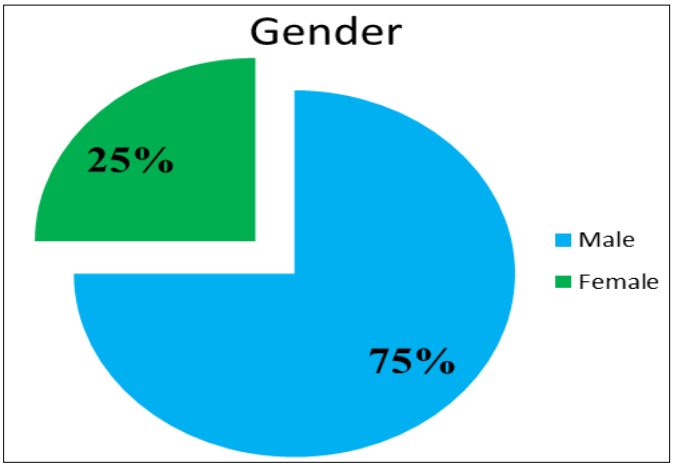

Fig 1(b): Pie diagram representing percentage distribution of Gender regarding Ataxia among staff nurse.

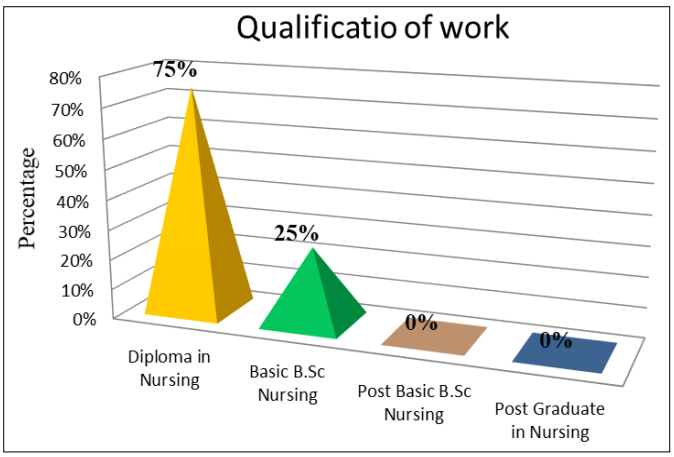

Fig 1(c): Cone diagram representing percentage distribution of Qualification of work regarding Ataxia among staff nurse.

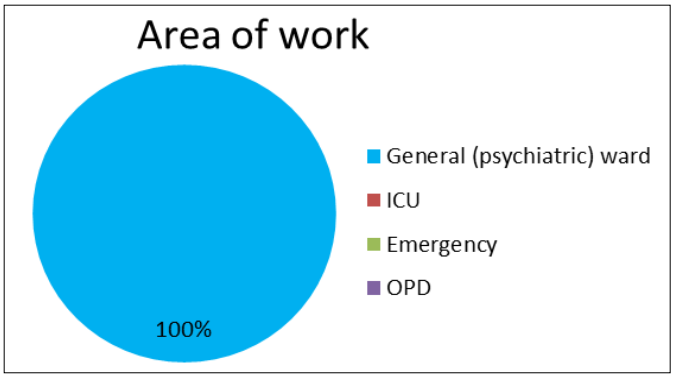

Fig 1(d): Pie diagram representing percentage distribution of Area of work regarding Ataxia among staff nurse.

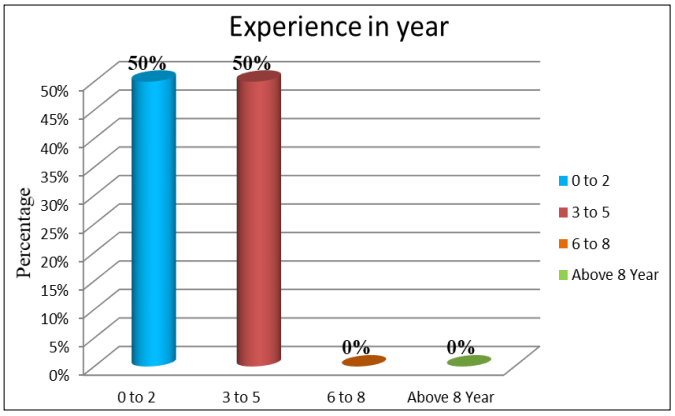

Fig 1(e): Bar diagram representing percentage distribution of Experience in year regarding Ataxia among staff nurse.

Section II: Structure questionnaire use to assessing the level of knowledge regarding ataxia among staff nurse.

Table 2: Assessing the level of knowledge regarding ataxia among staff nurse.

Level of knowledge	Frequency (f)	Percentage (%)
Poor (0-4)	0	0
Average (5-8)	3	75
Excellent (9-13)	1	25

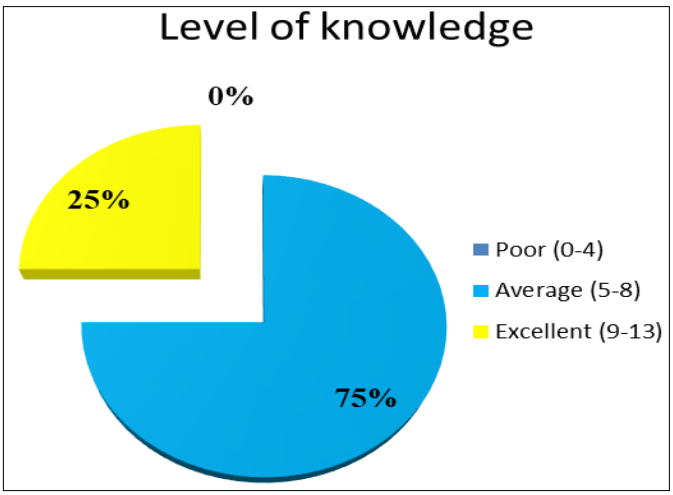

Fig 2: Pie diagram representing percentage distribution of levels of knowledge regarding Ataxia among staff nurses.

Table 3: Overall mean and standard deviation of knowledge score recording ataxia among staff nurse.

Group	Mean	Standard deviation SD
Staff Nurses	7.75	1.089

Causes Identified

From the analysis of the gathered information various causes which were responsible for ataxia. These causes were.

A. Personal factors

Lack of knowledge

Problem solving outcome

At the end the staff nurses will gain proper knowledge regarding the side effects of the drugs and will able to minimize the incidence of the ataxia among the psychiatric patients.

Solutions for achieving the goal

- Conduct class for educate the staff nurse of psychiatric ward about the Ataxia.
- Distribution handout of Ataxia.
- Demonstration symptoms of the Ataxia patient in the ward.

Consider Consequences

- When nurses attend the class on Ataxia their knowledge will improve in particular area which will help modify their practice.
- When demonstrate the symptoms of Ataxia patient their clear all the doubt it helps to improve their knowledge and thereby bringing changes in practice and will also serve as an easy reference for them.

Make a decision

- On the basis of possible solution and their consequences it was found that all solution was directly improving the knowledge regarding Ataxia among the psychiatric ward nurses. So the following decisions were made:
- Conduct class for educate the staff nurse of psychiatric ward about the Ataxia.
- Distribution handout of Ataxia and Demonstration symptoms of the Ataxia patient in the ward.

Implementation

- A staff educate class on Ataxia was conducted for psychiatric nurse on 12th may 2017.
- Developed and distribution handout of Ataxia.
- Demonstrate the symptoms of Ataxia patient which is present in the ward.

Evaluation

The selected problem was assessed along with steps taken to solve it. Nurses understood the proper each and everything about the Ataxia. Nurses ensure to practice accordingly thereafter.

Summary

The problem selected by the investigators was very useful for the nurse to prevent injury and to improve the symptoms of Ataxia and nutrition level of the patient.

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