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Nursing Management Perspective of Health Care for Patients with Glaucoma in the Nigerian Health System

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Abstract

Nurses, especially the ophthalmic nurses, should rise up to the challenge of the silent thief of sight known as glaucoma which is popularly referred to as the second leading cause of blindness in Nigeria and the world at large. Just as hypertension is to the heart and circulatory system so also, glaucoma is to the eyes. The effect of losing one's sight cuts across every aspect of the individuals' life, physically, mentally, psychologically, socially and otherwise. Thus, there is the need to constantly sound the trumpet of awareness about this disease that comes as an individual ages. The causes, types, pathophysiology, signs and symptoms, assessment and diagnostic findings, pharmacological, surgical and a comprehensive nursing management of patients with glaucoma, prevention/control of glaucoma and follow-up care were reviewed. This was in order to help create the awareness about the disease and the need to prevent and control the progress of the disease, thus helping in the reduction of the incidence of blindness caused by "the silent thief of sight". Hence, recommendations were made to promote the knowledge of the disease, and for early assessment for those at risk of the disease and early treatment to prevent complications associated with it. The role of a nurse in the fight against blindness is crucial as he/she has the advantage of meeting people and earning their trust both within and outside the clinical setting.

Key words: Nursing Perspective, Patients and Glaucoma.

Introduction

Glaucoma is the second leading cause of blindness in the world. The term "glaucoma" is used to refer to a group of ocular conditions characterized by optic nerve damage which is the leading cause of irreversible blindness worldwide (Smeltzer, Bare, Hinkle & Cheever, 2012).When most types of glaucoma develop,

the symptoms do not usually appear early and the disease progresses slowly until there is an irreversible damage that steals one's sight very gradually. Thus, it is referred to as a "silent thief of sight". However, with early detection and treatment, serious and irreversible vision loss can be prevented. Thus, the role of nursing in the education of the populace or at-risk groups towards its prevention and management cannot be overemphasized.

The American Optometric Association [AOA] (2014) defined glaucoma as a group of eye disorders leading to progressive damage to the optic nerve, and is characterized by loss of nerve tissue resulting in loss of vision. Mayo's Clinic (2010) described glaucoma as a group of eye conditions resulting in optic nerve damage usually caused by abnormally high intraocular pressure. Mickinnon, Goldberg, Peeples, Walt and Bramley (2008) stated that there is no doubt that an increased intraocular pressure damages the optic nerve, but the degree of harm is highly variable in individuals. Also, glaucoma is seen to be a rise in intraocular pressure which is determined by the balance between the rate of production and rate of drainage of aqueous fluid.

Glaucoma is the second most common cause of blindness worldwide, affecting approximately 65 million people around the world and an estimated 7.5 million are blind due to the disease . It is also estimated that half the blindness from glaucoma in the world is caused by angle closure. It is more prevalent in people older than 40 years of age (Quigley, 1996; American Optometric Association, 2014).

In a study aimed at finding out the prevalence of glaucoma in Nigeria from 1998-2006 by Nosiri, Chawat and Abba (2009), it was discovered that in 1998, 330 patients representing 4% of the total study population of 11,000 had glaucoma, while in 2006, 1680 patients representing 23% had it. This revealed an increase in the prevalence of glaucoma. It is pertinent to identify its causes.

Causes of Glaucoma

The exact cause of glaucoma is unknown. Although the disease is usually associated with an increase in the fluid pressure inside the eye, other theories include lack of adequate blood supply to the nerve. Risk factors linked to glaucoma according to the American Optometric Association (2014) and Mayo Clinic (2010) are:

Age: People over age 60 are at increased risk for the disease. However, for African Americans, the increase in risk begins after age 40 with the risk of developing glaucoma increasing slightly as individuals age; this is sequel to body tissue degenerative process.

Sex: Females are three times more likely to develop glaucoma than males because of hormonal alteration at old age.
Ethnic background: East Asians, because of their shallower anterior chamber depth, have a higher risk of developing glaucoma compared to Caucasians. People of African – American descent are 3-4 times more likely to develop the disease compared to American whites.
Medical conditions: Some studies indicate that diabetes may increase the risk of developing glaucoma, so also, high blood pressure and heart disease because these are vascular conditions and are age-related (Morgan and Drance, 1975).
Eye injuries or traumatic conditions: especially severe ones, such as retinal detachment, eye inflammation and eye tumour are linked to a higher glaucoma risk.
Myopia: People with myopia (nearsightedness) have a higher risk of glaucoma.
Corticosteroids: Patients on long term corticosteroids eye drops are susceptible to developing glaucoma.

Types of Glaucoma
According to Boyd (2013), the different types of glaucoma are:
a. Chronic open angle glaucoma or primary open angle glaucoma.
b. Primary acute glaucoma or closed angle glaucoma
c. Secondary glaucoma
d. Bulphthalmos (ox-type) or childhood glaucoma or congenital glaucoma.
e. Normal tension glaucoma or low tension glaucoma: In this type, the individual is observed to have normal tension of less than 21mmHg but present with optic nerve damage with subsequent visual loss.
f. Pigmentary Glaucoma: This is when a pigment from the iris sheds off and blocks the meshwork, slowing fluid drainage.

Pathophysiology and Symptomatology of Glaucoma

The National Eye Institute which is a subsidiary of the National Institute of Health (2013) stated that several large studies have shown that eye pressure is a major risk factor for optic nerve damage (the optic nerve is a bundle of more than 1 million nerve fibres that connect the retina to the brain thus a healthy optic nerve is necessary for good vision). Mandal (2013) and Heiting (2014), also contributing to the pathophysiology of glaucoma, indicated that it usually occurs when there is an increased intraocular pressure in the eye which happens when there is a reduction in the circulation of aqueous humour in the anterior chamber of the eye. Normally, it flows out of the eye through a mesh-like channel called

the trabecular meshwork. If this channel becomes blocked, fluid builds up causing increased intraocular pressure and thus, glaucoma develops. The direct cause of this blockage is unknown, but it has been established that it can be inherited (Mandal (2013). It is this raised pressure that compresses and damages the optic nerve. Once the optic nerve is damaged, it fails to carry visual information to the brain and this results in loss of vision. It is believed that the raised pressure on the retina (known as retinal ganglion apoptosis) causes the cells and nerve ganglions in the sensitive retina to die off. In addition, the small blood vessels of the retina are also compressed depriving it of nutrients (Mandal, 2013). This results in a clinically progressive loss of peripheral visual field, and ultimately vision.

Furthermore, the eye's drainage angle is referred to as being either "open" or "closed" (narrow). The narrower the angle, the more difficult it is for the aqueous to flow through it. An open angle also can hinder the outflow of aqueous, if structural damage exists within the ocular tissues of the angle itself. There is always an imbalance in the production of the aqueous humour by the ciliary body and its drainage by the trabecular meshwork causing an internal eye pressure (IOP) to rise Mandal (2013). Chronic glaucoma, also known as primary open-angle glaucoma (POAG), is often called "the silent thief of sight" because it has no warning sign, no pain and no hint that anything is wrong (Heiting, 2014). Acute narrow-angle glaucoma occurs suddenly when the iris is pushed or pulled forward. This causes blockage of the drainage angle of the eye where the trabecular meshwork allows an outflow of fluids.When internal eye structures are blocked in this way, the eye's internal pressure (IOP) may spike and possibly damage the optic nerve that transmits images from the eye to the brain.

However, debunking this theory of high intraocular pressure alone that causes damage is the normal tension glaucoma. Here, there is no rise of intraocular pressure. But rather, the patients are said to suffer from a problem in the blood vessels and perfusion and derangements of the immune system (auto immune causes) that may lead to damage to the optic nerve (Heiting, 2014). Some studies show that optic nerve heads of these patients are particularly sensitive with damage occurring at much lower intraocular pressures than in normal individuals. Thus, they may also benefit from medications that can reduce intraocular pressure.

Signs and Symptoms of Glaucoma

According to Kozarsky (2014), studies have shown that for most people, there are usually few or no symptoms of glaucoma. The first sign of glaucoma however, is often the loss of peripheral or side vision which can go unnoticed until late in the disease (Kozarsky, 2014). Occasionally, intraocular pressure can rise to severe levels showing the signs and symptoms that could be experienced as

light sensitivity (photophobia), sudden eye pain, headache, blurred vision, the appearance of (halos around lights) rainbow-coloured circles, vision loss, redness in the eye, crossed or out-turned eyes (strabismus), eyes that look hazy (particularly in infants), nausea or vomiting, narrowing of vision (tunnel vision) and excessive blinking (blepharospasm) (Kozarsky, 2014).

Symptoms of glaucoma vary according to the type one has. Most people who suffer from open angle glaucoma have no symptoms when they are diagnosed. They may have some side vision loss which may not be noticed until it becomes severe. This is because the less affected eye makes up for the vision loss. The loss of sharpness of vision (visual acuity) may not become apparent until late in the disease when a significant vision loss might have occurred. In Closed-Angle Glaucoma (CAG), symptoms may range from mild to severe and usually affect only one eye at a time. There may also be short episodes of symptoms that usually occur in the evening and are over by morning (Kozarsky, 2014). This is called sub-acute closed angle glaucoma and is progressive in nature. On childhood glaucoma also known as congenital glaucoma, Okorie and Madu (2010) stated that a major characteristic is the ocular enlargement (Ox-eye) coupled with clinical triad of epiphora, blepharospasm and photophobia.

Assessment and Diagnostic Testing

American Optometric Association (2014) and Bell and Roy (2014) gave an outline for proper assessment and diagnostic testing for glaucoma. The purpose of a glaucoma workup is to establish the diagnostic category and assess the optic nerve damage in order to formulate a good and effective treatment plan. An assessment and diagnostic testing that is generally required includes:

- A detailed patient's ocular and medical history which should be obtained to determine symptoms experienced and the general health problems of the patient.
- Visual acuity measurements to determine the extent to which vision may be affected
- Tonometry which is done to measure the intraocular pressure.
- Gonioscopy which examines the filtration angle of the anterior chamber.
- Ophtalmoscopy which is done to inspect the optic nerve for changes over time
- Pachymetry which helps to measure corneal thickness. People with thinner corneas are at an increased risk of developing glaucoma.
- Visual field testing also called perimetry is done to check if the field of vision has been affected by glaucoma. This test measures side (peripheral) and central vision by either determining the dimmest amount of light that can be

detected in various locations of vision, or by determining sensitivity to targets other than light, and comparing it to others of similar age (Bell and Roy, (2014). Laboratory tests that may be used to rule other causes for optic neuropathy in patients suspected of having normal-tension glaucoma include CBC count, Erythrocyte sedimentation rate, Serology for syphilis (micro-hemagglutination - *Treponemapallidum* [MHA-TP], not Venereal Disease Research Laboratory [VDRL] test) and rarely, serum protein electrophoresis to identify glaucomatous optic neuropathies in persons with potential autoimmune aetiology. No doubt, these tests or examinations reveal comprehensively the status of one's eyes to either confirm or rule out glaucoma. In each of the types or diagnoses, proper management is required for correction or improvement of the eye.

Management of Glaucoma

The modern goal of glaucoma management includes:

1. Avoiding glaucomatous and optic nerve damage.
2. Preservation of visual field and total quality of life (QOL) for patients with minimal side effects.
3. Immediate treatment for early-stage of open-angle glaucoma. While an immediate treatment for early-stage of open-angle glaucoma can delay progression of the disease and save the remaining vision, it does not improve sight already lost from glaucoma (Smeltzer, Bare, Hinkle & Cheever, 2012).

Medical Management

These may be instituted pharmacologic therapies that lower intraocular pressure (IOP). Poor compliance with medications and defaulting in follow-up visits are major reasons for vision loss in glaucoma patients. Medical therapy is effective in preventing onset of POAG and averting the progression of glaucoma but the cost of maintaining a therapeutic goal can be too high for some poor resource people (Leske, Heiji, Hussein, Bengtsson, Hyman and Komaroff, 2003). Various classes of drugs can be used depending on individual tolerance.

Surgical Intervention

Surgery is almost always the correct treatment in Africa where medical treatment has failed (Richard & Subramanian, 2006). The surgeries, according to Smeltzer, Bare, Hinkle, & Cheever (2012) and American Opthometric Association (2014), are: Laser surgery, Trabeculectomy, Goniotomy, Iridotomy and Glaucoma drainage implants.

Care of Hospitalized Glaucoma Patient

The care of a hospitalized patient with glaucoma requires a holistic and skillful approach. The nurse as an integral part of the health management team has the responsibility of ensuring that the patient gets all the care that is required in order to properly recuperate and be rehabilitated into the community. A detailed description of the pre and post nursing management by Stollery, Shaw and Lee (2005) is expected to serve as a guide to the nurse. The management approaches are in stages:-

Pre-Operative Nursing Management.

This should comprehensively involve the following in a sequential order:

- Patient is admitted into a quiet, dimly lit area of the ophthalmic ward and placed in a comfortable position, preferably fowlers' position.
- Encourage expression of feelings about the disease and provide accurate and factual information to the patient.
- Explain to the patient that treatment to the eye will relieve general symptoms and additional progressive optic nerve damage.
- Inspect affected eye to note for proptosis, injection and ocular infection inflammation.
- Monitor vital signs closely.
- Carry out routine urinalysis to rule out diabetes.
- Visual acuity is tested if patient is fit enough.
- Show patient to helpful resources/people that are recuperating well so as to reassure patient that he/she is not alone in dealing with the same problem.
- Emphasize the importance of maintaining and adhering to a drug schedule, counting of eye drops and correct application of eye drops to promote compliance even after surgery.
- If patient vomits, he/she is given a vomiting bowl and prescribed antiemetic should be administered.
- Handle patient sympathetically and show understanding of his/her feelings.
- Recommend measures to assist the patient to manage visual limitations and reduce safety hazard by reducing clutter, arranging furniture and free from water.

- Give the patient adequate fluid, bulk/fibre intake to maintain consistency of stool to avoid constipation/straining during defaecation which can in turn increase IOP.

- Cold compresses on the forehead will be appreciated to relieve pain.
- Administer prescribed analgesics for pain if IOP still increases with persistent headache, nausea and vomiting, IV mannitol 200mls given over 1 – 2 hours.
- Fluid intake and output chart is monitored
- Administer prescribed pre-operative eye drops.
- Assist in all investigations.
- Cut eye lashes in preparation for surgery.

Post-operative Management

This involves the nurse carrying out the following services:

- Monitor vital signs closely.
- Observe padded operated site for excessive bleeding, tightness and discomfort.
- Monitor fluid intake output and care for intravenous rate/flow and site of cannula.
- Maintain fluid balance chart.
- When carrying out eye dressing, maintain strict aseptic technique.
- The bleb should be noted under the conjunctiva.
- The pad and bandage should be firm but not too tight to cause obstruction of blood vessels. It is removed to insert post operative eye drops.
- All post operative eye drops are instilled: antibiotics, steroids, mydriatrics as prescribed by the doctor.
- Constipation and straining at stool should be avoided.
- Observe for early complications like over drainage and under drainage hypema.
- Reinforce avoidance of activities such as heavy lifting/pushing.
- Explain to the patient that eye rubbing should be avoided.
- Stress importance of routine checkups so as to monitor the progression/maintenance of disease to prevent further loss of vision.
- Recommend that family members be examined regularly for signs of glaucoma.

Post-operative Complications

The most serious complication of filtering procedures include haemorrhage, an extremely low (hypotony) or elevated IOP, uveitis, bleb failure, bleb leak, bleb infection, bleb scarring, and endophthalmitis (Smeltzer, Bare, Hinkle & Cheever, 2012).

The Role of Nursing Education in the Prevention and Management of Glaucoma.

This should stress that glaucoma cannot be cured but its resulting blindness can be prevented. Thus emphasis on compliance with eye drops medication is essential. Even if it is uncomfortable or inconvenient, it should never be discontinued without first consulting the ophthalmologist about a possible alternative therapy. As a lifelong therapeutic regimen, patient education is crucial (AOA, 2010).The patient should be educated on the need to:

a. Maintain healthy weight and eat a varied and healthy diet.
b. Have a comprehensive dilated eye exam/screening at least once every 2 years for those with a family history of glaucoma.
c. Maintain drug compliance and proper timely application of eye drops which are as follow:
    - Wash hands
    - Tilt head back
    - Hold bottle in one hand, place it as close as possible to the eye and do not allow the tip to touch the face or eye.
    - With the other hand, pull down the lower eyelid forming a pocket.
    - Place prescribed number of drops into the lower eye lid pocket.
    - Close the eye or press the lower lid tightly with the finger for at least one minute (this helps to keep the drops in the eye and prevent it from draining into the tear duct which can increase the risk of side effects).
    - If using more than one eye drop, be sure to wait at least five minutes before applying the second one (National Eye Institute: National Institute of Health, 2013).
d. In addition, the nurse should also be adequately involved in counselling patients. Counselling is one of the keys of dramatic growth. Patient is educated on the need and importance of eye care. Counsellors should assist patients in decision making by giving detailed information about the operation, preoperative and postoperative care, discharge and follow up. Counselling enhances a patient's satisfaction and these satisfied patients act as a catalyst to bring more patients (Kotler & Clarke, 1987).

Follow Up

Kabiru, Bowman, Wood and Mafwiri (2012) on an audit at trabeculectomy at a tertiary referral hospital in East Africa stated that a number of studies from Africa reported a poor long term follow-up. This was supported by Richard and Subramanian (2006) who reported that in Kano, it was discovered that only 7% of patients had proper follow-up after surgery. It is important to try to improve on this through patient counselling about follow up and its importance. Financial incentives such as partial reimbursement of surgical fees or transport costs may be appropriated and helpful. For the patient with severe glaucoma and impaired function, referral to services that assist the patient in performing ADLs may be needed. The loss of peripheral vision impairs mobility the most so that these patients need to be referred for low vision and rehabilitation services. Patients who meet the criteria for legal blindness should be sent to agencies that can assist them in obtaining federal assistance.

Reassurance and emotional support are important aspects of care. A lifelong disease involving possible loss of sight has psychological, physical, social and vocational ramifications. The family must be integrated into the plan of care and because the disease has a familial tendency, family members should be encouraged to undergo examinations at least once every 2 years to detect glaucoma early (Murdoch, 2006; Mickinnon, Goldberg, Peeples, Walt & Bramley, 2008).

Prevention and Control of Glaucoma

Though glaucoma cannot be cured, its severity and development into a complication can very well be prevented and controlled. Tips extracted from Mayo's Clinic (2010) and Kang, Willett, Rosner, Hankinson and Pasquale (2008) include:

- Getting a regular eye examination.
- Maintaining healthy weight because being overweight increases insulin resistance which in turn has been shown to increase eye pressure.
- Maintaining healthy blood pressure is important because high blood pressure has been linked to increased eye pressure. Lowering blood pressure also lowers eye pressure, thus decreasing the risk of glaucoma.
- Drinking small amounts of fluid frequently throughout the day rather than drinking large quantities a few times a day.

- Salt and caffeine intake should be reduced as excessive intake increases intraocular pressure.
- Use of high protection devices to prevent trauma to the eye is also emphasized such as when using power tools or welding and goggles when swimming.
- Use prescribed eye drops exactly as directed by ophthalmologists. If more than one type of eye drop is prescribed, wait for directed time between application. When using eye drops, close eyes for one or two minutes after putting the drops into the eye next to the tear duct. Press tightly with a fingertip. Wipe off any moisture on the skin.
- Take medication as prescribed especially with meal to reduce nausea. Also, increase intake of potassium, e.g., eating banana or taking potassium supplement.
- Get surgery if an ophthalmologist recommended it. Surgery could save the vision.
- The importance of regular exercises especially for those with open angle glaucoma should be stressed because they help decrease eye pressure but a strenuous exercise and yoga position where the head is down should be avoided because of increased IOP.

Recommendations in the Management of Glaucoma

In order to achieve the global initiative of vision 2020:

1. A fully integrated primary, secondary and tertiary eye care services should be put in place.
2. There should be continuous screening for all patients especially those at risk and genetic counselling for identified patients. Also, use community based rehabilitation workers in case finding and referral to hospitals.
3. There is the need for advocacy for the inclusion of glaucoma in the national benefit of the National Health Insurance Scheme.
4. Ophthalmic nurses should be taught to manage all routine post operative glaucoma patients, give ocular anesthetist and do minor operations so that the ophthalmologist can do more complex operations and laser surgery.

Conclusion

In this paper, the related anatomy and physiology, types, pathophysiology, signs and symptoms, assessment and diagnostic findings, pharmacological, surgical and a comprehensive nursing management of patients with glaucoma, prevention and control of glaucoma and follow-up care were reviewed. This is in order to help create the awareness about the disease and the need to prevent and

control the progress of the disease, thus helping in the reduction of the incidence of blindness caused by “the silent thief of sight” through education.

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