Review Article

Ocular Injuries in Children: Nursing Assessment and its Management

Dr. Shanjeev Bhattarai
Lecturer in Optometry, Maharajgunj Medical Campus and B.P. Koirala Lions Center for Ophthalmic Studies TUTH
Correspondence: bhattaraisanjeev@yahoo.com

ABSTRACT

Eye injuries are common in children and are the common preventable cause of blindness. As the children are the future pillar of the country, for them an eyes are the most sensitive of all sense organs. The aim of this review is to share knowledge about eye injuries among the children and its nursing care. An eye injury can be a painful and scary experience usually presents with marked eye pain, redness, swelling with watering. The basic types of injuries are chemical, thermal, radiation and mechanical. For both acid and alkalis injury, immediate eye irrigation with prompt, profuse and prolonged manner should be carried out. Other common eye injuries are corneal abrasion, subconjunctival hemorrhages, extra ocular and intraocular foreign bodies, open and closed globe injuries. While many minor eye injuries can be treated at home by flushing the eye with water, more serious injuries need medical attention with ophthalmic nurses and ophthalmologists. Topical antibiotics and in few cases corticosteroids are instilled to prevent infection and scarring. Parents and children should be well educated about causes and sequences of common ocular injuries.

Keywords: Chemical injury, Corneal brasion, Foreign bodies, Radiation injury, Thermal injury.

INTRODUCTION

In this era of high speed traffic and industrialization, the incidence of ocular injuries is increasing in children. Small objects or liquids can get into the eye causing eye red, sting and discomfort. Eye injuries can range from the very minor to the sudden disaster resulting in permanent loss of vision. These types of injuries can occur anywhere in the workplace, at home, agriculture field, from accidents, or while participating in sport activities. Eye injuries are the preventable cause of blindness. Despite the fact that the eyes represent only 0.27% of the total body surface area and 4% of the face, these are the third most common organs affected by injuries after the hands and feet(Boyd and Recchia,2009). Worldwide there are approximately 1.6 million people blind from eye injuries, 2.3 million bilaterally visually impaired and 19 million with unilateral visual loss. Ocular trauma has been reported to be the commonest cause of unilateral blindness (Karmacharya, 2010).

CLASSIFICATIONS

Mechanical Injury: It includes extra ocular foreign bodies in an eye, blunt trauma by fist and blunt instruments, falls, projectile objects etc, penetrating and perforating injuries and intraocular foreign bodies.

Chemical Injury: These are quite common. Amongchemical, alkali burns are the most dreadful injuries. Sources for alkali burns are like caustic potash, color powders in Holi, cement, plaster, fertilizers, refrigerators and drain cleaners etc. Acid burns are less serious than alkali burns. Sources for acid burns are like sulphuric acid, hydrochloric acid, vinegar, glass polish ingnitric acid, toilet cleaner, fruit and vegetable preservatives etc. In acid as well as alkali ocular injuries children are brought with acute red eye with burning,photophobia,tears with marked eye pain.

Thermal Injury: Thermal injuries are caused by fire,hot fluids,heated materials,cigarette,kitchen oils, and exposure to fire,hot gases etc. Any ocular burn is

an ophthalmic emergency because of the rapid ocular tissue damage that it can cause.

Electrical Injury: Its cause is electrical short circuits. Passage of electric current in an eye causes electric cataract, iridocyclitisretinal hemorrhages, optic neuritis, red eye with opacification.

Radiation Injury: Sources for radiation injury is ultraviolet and infrared rays that can cause photokeratitis and conjunctivitis, radiation cataract etc (Raj, 2017).

NURSING ASSESSMENT

A nurse not only has to assist the ophthalmologist in the management but sometimes may be the first person to attend the emergency. So she needs to be well versed with the nursing assessment and first aid care which is often very important and may prevent childhood blindness. Several reviews were carried out to synthesize the concept from website and research papers on ocular injuries among the children.

Proper history including nature of injury, circumstances, time and likely objects should be noted. Hands should be washed thoroughly before approaching the eye.

Visual acuity should be monocularly taken to know the extent of vision loss. Pupillary examination including size, shape and reaction is crucial.

Intraocular pressure (IOP) measurement and extra ocular motility examination may be helpful for diagnosis.

Other necessary investigations that the nurse may advice and assist after consultation with ophthalmologist are X –rays,CT scan and MRI of orbit and brain, USG in cases of intraocular foreign bodies. But time should not be wasted on prolonged history taking if urgent treatment is necessary or indicated especially in chemical and thermal injuries. It should be started in minutes.

Examination should be carried out very gently and undue pressure should not be applied. A small child may be difficult to examine adequately and may need general anesthesia for evaluation and management.

Eyes with surface foreign bodies should not be rubbed. Penetrating injuries may be covered with a plastic or metal eye shields to protect the eye until the patient is seen by the doctor. Such injuries require tetanus prophylaxis.

A nurse should advise the patient not to eat or drink until ophthalmologist gives any instructions (Shrestha and Shrestha, 2011).

NURSING CARE AND MANAGEMENT

Chemical Injury: initially removal of irritant material should be done. Immediately copious irrigation with sterile ringer lactate (RL) or even balanced salt solution should be done for at least 30 minutes with 500-1000 ml of fluid with an intravenous infusion set till the PH comes to normal level. This process is done to neutralize the toxic reactions due to chemicals within the eyes. Debridement of necrotic corneal epithelium is necessary to allow proper re-epithelialization. An antibiotic drops 3-4 times daily and ointment at night time to be administered. Cycloplegics and lubricating eye drops should be applied to relieve pain and photophobia (Ramgopal, 2013)

Thermal Injury: all necrotic epithelium should be removed by the ophthalmologist. Topical antibiotic and cycloplegic drops should be instilled with ointment at bed time. VitaminC (Ascorbic acid) should also be given because it improves wound healing and synthesis of collagen. To reduce inflammation corticosteroid eye drops should be applied under the supervision of ophthalmologist. Bandage contact lenses which act as a bandage for the wound can be fitted for proper re-epithelialization of cornea (Basak, 2007).

Radiation Injury: cold compression with ice packs should be done. Analgesics and cyclopentolate drops should be applied for pain. Ocular NSAIDs drops along with lubricating eye drops and ointment at bed time should be applied. Oral vitamin C help in early recovery (Shrestha and Shrestha, 2011).

Superficial Ocular Foreign Body: in beginning to make child comfortable, lignocaine or xylocaine eye drop should be instilled in the affected eye. Foreign body should be removed by swab stick or sterile hypodermic needle. Then cornea and conjunctival

sac should be washed with normal saline thoroughly. For prophylaxis, antibiotic drops at day time and ointment at bed time should be applied. For fasthealing, eye pad can be applied for 24 hours. If cornea is involved then atropine sulphate eye drops or ointment should be put to relieve ciliary spasm and photophobia (Khurana, 2016).

In case of corneal abrasionan antibiotic eye ointment is applied along with an eye pad and bandages left overnight. The patient is examined next day for healing and to rule out possibility of infection. For intraocular foreign bodiesit needs immediate evaluation by an ophthalmologist. Foreign body should be removed as soon as possible and oral antibiotics should be prescribed for few days (Malla, Pradhan and Joshi, 2018).

In case of penetrating and perforating eye injuries antibiotic drops but no ointment should be applied. Sterile eye pad and bandage should be applied. Systemic antibiotics and transportation to tertiary level ophthalmic center should be carried out (Karmacharya, 2010)

If the child is brought with subconjunctival hemorrhages to absorb the blood in the conjunctiva, cold compression for 5 to 10 minutes twice daily and assurance should be given. For symptomatic relief,astringent and lubricating eye drops can be prescribed. (Datta and Chakraborti, 2013).

PREVENTION: Alertness averts accidents. So, parents should be advised to be vigilant and practice safety measures. In home,sharp tools and chemicals should be kept away from the reach of children. Children also should be educated about the safety of eyes. They should be discouraged from playing dangerous games like bow and arrow,catapult,sli nging,throwing stone and mud etc. While playing outdoors,protective eyeglasses or goggles should be worn. Parents and caregivers for children need to practice safe use of common items that can cause eye injury like pencils, scissors,rubber bands,bungee cords,wire coat hangers etc (Boyd and Recchia, 2009).

CONCLUSION: Ocular injury is the most common preventable cause of blindness in children. Most of the ocular injuries are an ocular emergency that requires prompt and prolonged treatment. Among that chemical injuries with alkali and acid must be treated within minutes. Nurses can play an important role in educating parents in preventing ocular injuries including in first aid management and in prevention of further damage to eyes.

REFERENCES

Boyd Samuel, Franco Recchia (2009). Modern Management of Ocular Trauma (2nd Edition). Jaypee

Medical Publishers, INC. New Delhi. Page no: 35-47.

Datta Gautam (2018). Essentials of Paediatric Optometry (1st edition). Current Books International. Kolkata. Page no: 204-210.

Datta Jyotirmoy, Chakraborti Chandana (2013). Sure Success in Ophthalmology (3rd edition). Jaypee

Brothers Medical Publishers (Pvt.Ltd. New Delhi. Page num: 188-196.

Karmacharya P.C., Panta C.R., Adhikari K.P. (2010). Text Book of Ophthalmology for Paramedicals (1st edition). HMG/WHO Nepal Prevention and Control of Blindness Programme. Tripureshwor, Kathmandu.

Khurana A.K. (2016). Comprehensive Ophthalmology (7th edition). CBS Publishers and Distributors Pvt. Ltd. New Delhi. Page no:401-402.

Malla O.K, Pradhananga C.L, Joshi S. (2018). Hand Book of Practical Ophthalmology (2nd edition). Samiksha Publication Pvt. Ltd. Kathmandu. Page no: 128-133.

Raj K. Mohan (2015). Ophthalmology (3rd edition). Jaypee Brothers Medical Publishers (p)Ltd. New Delhi. Page no: 288-298.

Ram Gopal B. (2013). Quick Review of Ophthalmology. Jaypee Brothers Medical Publishers (P) LTD. New Delhi.

Shrestha G.S. and R. (2011). Fundamentals of Ophthalmic Nursing (1st edition). Makalu Publication House. Dillibazar, Kathmandu. Page no: 196-201.