REVIEW ARTICLE

River Blindness – An Eye Disorder

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ABSTRACT:

Onchocerciasis, also known as river blindness and Robles' Disease, is a parasitic disease caused by infection by Onchocerca volvulus. Doxycycline and Ivermectin are used to treat this disease.

KEYWORDS:

INTRODUCTION:

The visual system detects, transmits and interprets photic stimuli. Photic stimuli are electromagnetic waves with wavelengths between 400 and 725 nm. This is visible light or the adequate (effective) stimulus for the eye.

According to WHO estimates, the most common causes of blindness around the world in 2002 were: cataracts (47.9%), glaucoma (12.3%), age-related macular degeneration (8.7%), corneal opacity (5.1%), diabetic retinopathy (4.8%), childhood blindness (3.9%), Trachoma and onchocerciasis (0.8%).

In terms of the worldwide prevalence of blindness, the vastly greater number of people in the developing world and the greater likelihood of their being affected mean that the causes of blindness in those areas are numerically more important. Cataract is responsible for more than 22 million cases of blindness and glaucoma 6 million, while leprosy and onchocerciasis each blind approximately 1 million individuals worldwide. The number of individuals blind from trachoma has dropped dramatically in the past 10 years from 6 million to 1.3 million, putting it in seventh place on the list of causes of blindness worldwide. Xerophthalmia is estimated to affect 5 million children each year; 500,000 develop active corneal involvement, and half of these go blind. Central corneal ulceration is also a significant cause of monocular blindness worldwide, accounting for an estimated 850,000 cases of corneal blindness every year in the Indian subcontinent alone. As a result, corneal scarring from all causes now is the fourth greatest cause of global blindness.

In developed countries where parasitic diseases are less common and cataract surgery is more available, age-related macular degeneration, glaucoma, and diabetic retinopathy are usually the leading causes of blindness. Childhood blindness can be caused by conditions related to pregnancy, such as congenital rubella syndrome and retinopathy of prematurity. Abnormalities and injuries Eye injuries, most often occurring in people under 30, are the leading cause of monocular blindness (vision loss in one eye) throughout the United States. Injuries and cataracts affect the eye itself, while abnormalities such as optic nerve hypoplasia affect the nerve bundle that sends signals from the eye to the back of the brain, which can lead to decreased visual acuity. People with injuries to the occipital lobe of the brain can, despite having undamaged eyes and optic nerves, still be legally or totally blind.

Genetic defects:

People with albinism often have vision loss to the extent that many are legally blind, though few of them actually cannot see. Leber's congenital amaurosis can cause total blindness or severe sight loss from birth or early childhood. Recent advances in mapping of the human genome have identified other genetic causes of low vision or blindness. One such example is Bardet-Biedl syndrome.

Poisoning:

Rarely, blindness is caused by the intake of certain chemicals. A well-known example is methanol, which is only mildly toxic and minimally intoxicating, but when not competing with ethanol for metabolism, methanol breaks down into the substances formaldehyde and formic acid which in turn can cause blindness, an array of other health complications, and death. Methanol is commonly found in methylated spirits, denatured ethyl alcohol, to avoid paying taxes on selling ethanol intended for human consumption. Methylated spirits are sometimes used by alcoholics as a desperate and cheap substitute for regular ethanol alcoholic beverages.
RIVER BLINDNESS:
Onchocerciasis, also known as river blindness and Robles’ Disease, is a parasitic disease caused by infection by *Onchocerca volvulus*, a nematode (roundworm). Onchocerciasis is the world’s second-leading infectious cause of blindness. It is not the nematode but its endosymbiont, *Wolbachia pipientis*, that causes the severe inflammatory response that leaves many blind. The parasite is transmitted to humans through the bite of a blackfly of the genus *Simulium*. The larval nematodes spread throughout the body. When the worms die their Wolbachia symbionts are released, triggering a host immune system response that causes intense itching and can destroy nearby tissue, such as the eye.

Classification:
Onchocerciasis may be divided into the following phases or types:

**Erisipela de la costa:**
An acute phase characterized by swelling of the face with erythema and itching. Onchocerciasis causes different kinds of skin changes and these changes vary in different geographic regions. This skin change, erisipela de la costa, of acute onchocerciasis is most commonly seen among victims in Central and South America.

**Mal morando:**
A cutaneous condition characterized by inflammation that is accompanied by hyperpigmentation.

**Sowda:**
A cutaneous condition, a localized type of onchocerciasis. Additionally, the various skin changes associated with onchocerciasis may be described as follows:

**Leopard skin:**
A term referring to the spotted depigmentation of the skin that may occur with onchocerciasis.

**Elephant skin:**
A term used to describe the thickening of human skin that may be associated with onchocerciasis.

**Lizard skin:**
A term used to describe the thickened, wrinkled skin changes that may result with onchocerciasis.
Prevention:
There are various control programs that aim to stop onchoceriasis from being a public health problem. The first was the Onchocerciasis Control Programme (OCP), which was launched in 1974 and at its peak covered 30 million people in eleven countries. Through the use of larvicide spraying of fast flowing rivers to control black fly populations and, from 1988 onwards, the use of ivermectin to treat infected people, the OCP eliminated onchoceriasis as a public health problem. The OCP, a joint effort of the World Health Organisation, the World Bank, the United Nations Development Programme and the UN Food and Agriculture Organization, was considered to be a success and came to an end in 2002. Continued monitoring ensures that onchoceriasis cannot reinvade the area of the OCP.\[9\]

In 1992 the Onchocerciasis Elimination Programme for the Americas (OEPA) was launched. The OEPA also relies on ivermectin.\[10\] In 1995 the African Programme for Onchocerciasis Control (APOC) began covering another nineteen countries and mainly relying upon the use of ivermectin. Its goal is to set up a community-directed supply of ivermectin for those who are infected. In these ways, transmission has declined.\[11\]

Antibiotics:
For the treatment of individuals, doxycycline is used to kill the Wolbachia bacteria that lives in adult worms. This adjunct therapy has been shown to significantly lower microfilarial loads in the host, and may have activity against the adult worms, due to the symbiotic relationship between Wolbachia and the worm.\[12\] In four separate trials over ten years with various dosing regimes of doxycycline for individualized treatment, doxycycline was found to be effective in sterilizing the female worms and reducing their numbers over a period of four to six weeks. Research on other antibiotics such as rifampicin has shown it to been effective in animal models at reducing Wolbachia both as an alternative and as an adjunct to doxycycline\[13\] However, doxycycline treatment requires daily dosing for at least four to six weeks, making it more difficult to administer in the affected areas.\[14\]

Ivermectin:
Ivermectin is a broad-spectrum antiparasitic agent. It is traditionally used against worms. It is mainly used in humans in the treatment of onchoceriasis, but is also effective against other worm infestations (such as strongyloidiasis, ascariasis, trichuriasis, filariasis and enterobiosis).

Ivermectin, under the brand name Mectizan, is currently being used to help eliminate river blindness (onchoceriasis) in the Americas and stop transmission of lymphatic filariasis and onchoceriasis around the world.\[15\] Currently, large amounts of ivermectin are donated by Merck to fight river blindness in countries that are unable to afford the drug. The disease is endemic in 30 African countries, 6 Latin American countries and Yemen, according to studies conducted by the World Health Organization.

CONCLUSION:
Eye being a very sensitive organ, is easily prone to infections. Let us take care and protect our eyes.

REFERENCES: