Loss of vision secondary to toxic optic neuropathy due to gutka overdose: A Case Report

Abstract

Introduction: Toxic optic neuropathy is defined as the damage caused by a toxin to the optic nerve fibers. There is a vast list of toxins that may lead to optic neuropathies. One of the toxins among this list is tobacco. Gutka being an oral form of tobacco, however, has not been previously related to optic neuropathy.

Case presentation: We present a case of a 22-year-old male who presented with decreased far vision and gradually increasing photophobia. He had a history of gutka usage, a form of smokeless tobacco. Investigations revealed a central scotoma on FOV, a swollen optic disc on OCT and deranged Liver function tests. A diagnosis of RIGHT + LEFT optic neuropathy secondary to a chemical toxic was made, which in this case, was gutka.

Conclusion: Consumption of gutka can lead to irreversible toxic optic neuropathy.

Keywords: toxic optic neuropathy, gutka, smokeless tobacco, vision loss

Introduction

Gutka is a form of smokeless tobacco associated with oral cancer. Pakistan, India and Bangladesh have the highest consumption rate of gutka in the world, and according to the WHO there are approximately 10 million of Pakistani population addicted to smokeless tobacco. Tobacco is a known cause of toxic optic neuropathy. As gutka is a form of tobacco, one can conclude that it can cause optic neuropathy, however, existing literature does not link its consumption to the condition. We therefore report a case of toxic optic neuropathy resulting from presumed excessive consumption of gutka.

Case presentation

A 22-year-old man, with no known co-morbid, developed severe headache and blurred vision. According to him, he had consumed almost 5 times the usual amount of gutka earlier in the day. The headache gradually resolved but the visual blur continued. He was able to access medical help a month later, where he was prescribed oral prednisolone and investigated with MRI that was reported as normal. Two month later he presented to eye clinic at the Aga Khan University Hospital, Karachi, Pakistan. On examination, the patient’s best-corrected visual acuity was counting fingers at 2 feet distance in both the eyes. The refractive correction was -1.25 DS in both the eyes. Intraocular pressure was 10 mmHg bilaterally. Pupillary light reflex was sluggish bilaterally with no relative afferent pupillary defect (RAPD). Ocular motility was full. Dilated fundal examination showed bilateral hyperemic optic nerve heads (Figure 1). There was no peripapillary telangiectasia. Color vision test using Ishihara chart was reduced to one plate bilaterally. Visual field test showed high false negative, severe general depression and central scotoma. Diagnosis of toxic optic neuropathy was made and he was started on folate (150 mcg/day) and thiamine (1.2mg/day) supplementation for 3 months. He was advised to refrain from using gutka or any other form of tobacco. The patient was counselled in detail about the diagnosis and poor visual prognosis. He was also referred to gastroenterologist for deranged LFTs. A follow up 3 months later showed no improvement in the vision and bilateral temporal pallor of both her optic nerve heads. He was not able to perform automated perimetric test.

Figure 1 A (Right) and 1 b (Left): Fundal examination showing bilateral hyperemic optic nerve heads.
Discussion

Gutka consists of finely chopped, sun dried and roasted tobacco mixed with slaked lime, catechu, areca nut and a number of different spices. Chemical analysis of gutkha showed the presence of polyaromatic hydrocarbons, nitrosamines, and toxic metals such as arsenic, lead, cadmium, nickel, polyaromatic hydrocarbons and residual pesticides, with wide variation between different brands. It is placed between the buccal mucosa and the gums and is either sucked or chewed. Gutka is a form of smokeless tobacco which has gained a high popularity in south Asia among all age groups including children. Though served as a delight, gutka has shown to cause several adverse effects, mainly head and neck cancers. Nevertheless, no association of toxic optic neuropathy with gutka has been recorded.

Toxic optic neuropathy refers to visual impairment due to optic nerve damage by a toxin. Detailed history, neuroimaging and blood screening for toxins, infection, inflammation and nutritional deficiencies are essential to investigate toxic optic neuropathy. The clinical pattern of this case followed the typical pattern of toxic optic neuropathy. In this case thorough blood work up was conducted as well as imaging and tests such as fundus photography, perimetry and reporting of the previous MRI. As the patient presented 1 month after start of symptoms it could be that the imaging and testing was not as accurate as it could have been when the symptoms occurred. The exact mechanism of toxic optic neuropathy is unknown, however, it is hypothesized that the toxin impairs optic nerve’s vascular supply or metabolism. Tobacco in gutka may exert its effects by producing free radicals which cause direct damage to the papillomacular bundle in the optic nerve. Nicotine, with its vasoconstrictive action of nicotine may cause ischemic damage to the optic nerve by reducing its blood flow. Lead, another chemical found in gutka, has been reported to cause optic neuropathy. Other toxic chemicals, like arsenic found in gutka can further affect the optic nerve. Furthermore, the unusual pattern of vascular supply of optic nerve head may predispose it to the toxic agent’s accumulation.

Conclusion

To conclude, COVID pandemic carries a risk of increase in substance abuse. Smokeless tobacco, particularly gutka is on the rise in many parts of the world. This case report aims to inform health professionals to be aware of gutka as a possible cause of toxic optic neuropathy.