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# GUTKA ASSOCIATED OPTIC NEUROPATHY

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Optic neuropathy may be multi factorial in origin. It's association with gutka use in South East Asia is most likely under diagnosed and often overlooked, considering it is a diagnosis of exclusion. The Optic nerve toxicity is well known occurring due to medications, metals, organic solvents, methanol, and carbon dioxide.<sup>1</sup> Over recent years the effect of smokeless tobacco has been highlighted as one of the common causes of toxic optic neuropathy (TON), as visual impairment is already a colossal global health issue. Nonetheless, as high as 80 percent of the total burden of cases of blindness globally are due to causes that are actually preventable as per the World Health Organization (WHO). Various forms of tobacco have been used traditionally across cultures. A distinct form of chewable tobacco is gutka commonly used in South East Asia, it is as an amalgam with additional areca or betel nuts, slaked lime, and spices.<sup>2</sup> Out of 303 million smokeless tobacco users, 248 million (81%) live in south east Asia. In this region 24% men and 11% women use smokeless tobacco.<sup>3</sup> However, in the age of global connectivity and escalating immigrant settlements gutka use is now a reason for public health concern in western countries as well.

Legal, cheap in cost and easy retail availability make its use increasingly popular. Like many other tobacco products, Gutka is potentially addictive and cancerous. After nicotine, ethanol, and caffeine, it is the fourth most common publically used drug.

Studies have shown that the papillomacular bundle are selectively affected in some of these toxicities. It is possibly related to vascular supply of optic nerve.<sup>4</sup> TON presents with classic clinical signs of gradual and bilateral decrease in visual acuity, central and centrocecal scotomas, optic disc pallor, visual field defect, dyschromatopsia, and abnormal papillary response.<sup>7</sup> On clinical examination the pupillary reflexes are sluggish but usually no relative afferent pupillary defect is seen. Underlying mechanism is suggested to be mitochondrial injury and an imbalance of intracellular and extracellular - free radical homeostasis and nicotine induced vasoconstrictive action via  $\alpha$ -adrenergic stimulation which may impair blood flow through the choroid.

Age-related macular degeneration (AMD) is the leading cause of irreversible visual impairment among the elderly population worldwide, affecting 30–50 million individuals. A large cross-sectional study was conducted in Uttar Pradesh, India to assess the role of gutka in causation of AMD in people above 50 years of age. 102 of these individuals were diagnosed with AMD. A significant association was found between AMD and gutka usage. In Gutka chewers hospital-based prevalence of AMD was 7.9% as compared to non- gutka chewers (4.8%).<sup>5</sup>

Diagnosis of TON can only be confirmed after excluding other common causes. It is important to rule out a central pathology, mainly TB, syphilis, autoimmune conditions like sarcoidosis, multiple sclerosis, stroke with the help of MRI Brain with contrast and nutritional deficits, of vitamins, folic acid, and proteins with sulphur-containing amino acids.<sup>1</sup> Removal of the toxic process causing pathology is the first step in treatment. This may cause some reversal of the disease process. Medical therapy includes vitamin B complex supplementation and high dose steroids but its beneficial role in those associated with Gutka is still unproven.<sup>4</sup>

Initially a review is mandatory every 4–6 weeks and then, depending on their recovery, every 6–12 months. Visual acuity, pupils, optic nerves, color vision, visual fields, and OCT (Optic coherence tomography) should be assessed at each visit. Vision usually does not recover, improvement in visual acuity is more rapid as compared to color vision which may take months.<sup>4</sup>

The morbidity of TON depends independently on several aspects depending on the risk factors, etiology, the duration of symptoms and the start of treatment. Advanced optic atrophy is less likely to recover. The prognosis is thus variable and depends upon the nature of the agent, total exposure prior to removal, and degree of vision loss at the time of diagnosis.<sup>4</sup>

The cumulative death toll from tobacco use may increase ten folds as compared to last century.<sup>6</sup> State and local governments must ensure every tobacco user gets help required to quit and raise the minimum age of sale of such to at least 21 years and above. Halt the usual dauntless advertising and marketing seen with so many of these products.

Considering the prevailing use of Gutka in Pakistan, the number of patients with TON maybe staggering. However, due to the paucity of data; limited only to individual physician experiences and an inadequacy of information on the possible effects of gutka on the optic nerve the numbers are most likely understated. Exploration into the impact that gutka has on vision and its management is further warranted.

Tobacco use has been a usual common habit for several centuries and society does not frown upon it. Presently changed communal circumstances with the health scare of COVID 19 could provide an opportunity to renounce the use of Gutka. Health care workers have the additional responsibility to ascertain that its toxic effects on the optic nerve specifically are widely recognized as the public is only familiar with its neoplastic effects on the oral cavity. Otherwise continuous Gutka use may have a cataclysmic repercussion on the health care system at large.

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**Dureshahwar Kanwar**; data collection, data analysis, manuscript writing, manuscript review

**Mohammad Wasay**; concept, data analysis, manuscript review