Camphor Addiction: A Prospective Study of Camphorated Oil Use & its Outcome over the Period of 10 Years in Tertiary Care Centre

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Abstract
Camphor addiction is common problem in India and it causes neurological symptoms of addiction and withdrawal, which affects the person’s activity of daily living. In present paper we have analyzed, 1233 patients addicted to camphorated oil over more than 5 years duration. Headache, Insomnia, vertigo, depression, Visual blurring (118 patients) were the common clinical presentation in patients with camphorated oil addiction and 12 of the patients had Intracerebral bleed at time of presentation. Neuroimaging showed brain atrophy in 22 patients. 42% of these patients had re-addiction in follow up, due to firm belief about its medicinal use and withdrawal symptoms. It was concluded that, high end advertisements, lack of restriction of availability, misinformation printed on leaflets, persistent symptoms were the primary cause of chronic use leading to addiction.

Keywords: Camphor; Addiction; Headache; Visual loss

Introduction
Camphor (Cinnamomum camphora) is an organic compound commonly used in creams, ointments, and lotions. Camphor oil is the oil extracted from the wood of camphor trees and processed by steam distillation. Camphor have been used, globally since ages for recreational, medicinal and flavor purposes. In India, however, camphor tablets are used in Hindu religious ceremonies for aarti or lamps lighting to deities. It is also been used in many forms’ medicinal purposes like analgesics, abortifacients, aphrodisiacs and as an antifungal agent [1]. Although camphor is not recognized as a potentially toxic compound in general [2] studies have identified its neurotoxic effects following ingestion, inhalation and dermal exposure [3]. Due to its toxic nature Camphor levels in various products have been described and products with permissible limits have been only permitted to be marketed globally. Around 3 ml to 5 ml of 20% camphor oil or >30 mg/Kg is a potentially lethal dose in literature causing seizures and death [4,5].

In India, camphor is openly sold in general market and no permissible limits for the Camphor use have been described. Even for medicinal purposes, neither any permissible limits have been described nor does any regulatory body care for the same. Due to such laxity in rules India especially North India is mammoth market for camphorated products used in various forms for medicinal use.

Materials and Methods
All the patients presenting to Neurology Outpatient Department in SS Hospital, Varanasi, India from June 2011 to January 2020 where screened for use of camphorated oil in any form for more than three days in a week for more than 5 years were registered in the present study. Detailed clinical history, demographic data was taken with special reference to the factors leading to addiction, associated addiction, duration, characteristics of Headache, Vertigo, lightheadedness, neck pain. All patients were examined with special focus on fundus examination, focal neurological deficits. Hamilton depression Scale, mini mental state examination was done when necessary. All the patients were screened by Computed Tomography head and Magnetic Resonance Imaging was performed in 129 patients, including those who had history of visual blurring. Visual Evoked potential was studied in those patients who had features of visual loss.

Results
From June 2011 to January 2020, total 18,039 headache patients were screened and questioned about topical use of camphorated oil. 4783 (26.51%) patients were found to having use of camphorated
Camphoration of brain showed cerebral atrophy in 22 patients of 118 patients, who complained of visual blurring, neither had abnormal fundus findings, none of these patients had evidence of optic nerve hyperintensity on imaging. Of these 22 patients, 14 were analyzed for serum vitamin B12 level and were found to be on lower limit. Total 19 patients were found to have mild cognitive impairment on MMSE and of these 19 MCI patients 9 had brain atrophy on CT scan head and 8 lower level of vitamin B12 level in blood (Table 3).

**Table 1: Camphorated oil addicted patients: Clinical details.**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with H/O Visual Blurring</td>
<td>118</td>
</tr>
<tr>
<td>Focal Neurological Deficit</td>
<td>12</td>
</tr>
<tr>
<td>Brain Atrophy</td>
<td>22</td>
</tr>
<tr>
<td>Optic Neuritis</td>
<td>None</td>
</tr>
<tr>
<td>MMSE</td>
<td>MCI: 12</td>
</tr>
<tr>
<td>HAMD</td>
<td>Depression: 41</td>
</tr>
<tr>
<td>Re-addiction</td>
<td>505</td>
</tr>
</tbody>
</table>

**Table 2: Camphorated oil addicted patients: Associated features.**

**Table 3: Clinical details of patients with lower vitamin B12 level.**

**Discussion**

Camphor addiction is an underreported disorder in India and camphor is in rampant use in North India for many purposes and as a treatment of diseases too as a medicinal product. Only two studies have been done till now on Camphor addiction and on optic neuritis related to camphorated oil use by Mishra et al. [8] Present study is an important and first study in literature, which is done prospectively among 1233 chronic camphorated oil users and their clinical features.

In present study, we highlighted many interesting findings during the course of study period of 10 years. First, rampant use of camphorated oil has been in all religion, castes, ages and provinces. Second, unrestricted over the counter sale of these oils, even from general merchant stores, apart from medicine shops makes the easy availability to the public. Thirdly, enormous advertisements by film stars personalities have made the common masses to misunderstand these products as useful in various ailments.

In present study, we found that in total 18039 patients of headach 1/4th of patients were using camphorated oil for many different purposes. Most of these camphor addicted patients were of middle aged and older females. In our study there was significant association of camphorated oil use and female sex, 99% patients of camphor addicts were females. Over the period of study, we assessed that 25% patients had re-addiction to the camphor use. Many of patients had psychological withdrawal symptoms on stopping the use of camphor oil leading them to re-addiction over the time.

Camphorated oil has been implicated in neurotoxicity in the past in many studies causing seizures [9], optic neuritis [8]. In present study we found 10% patients in chronic camphor addicted patients had symptoms of visual blurring and of these total 118 patients 18.6% found to have cerebral atrophy on neuroimaging. There are no studies till now about imaging correlation and camphor addiction in the past. These patients on further evaluation showed low serum vitamin B12 level also showing association between camphor addiction and its toxicity related to low vitamin B12 levels. Serum B12 levels may be affecting the further neurotoxicity of camphor oil in these patients. In our study significant number of patients who had neurotoxicity symptoms also showed associated depression.

This study highlights the unwanted use of camphor oil in general public and misconception about its medicinal effects. This is first study in medical literature which focused on camphor oil addiction and its various neurological symptoms and toxicities. Present study also showed significant association between camphor oil addiction and visual blurring, cerebral atrophy, low serum B12 level and depression.

**Conclusion**

Camphor oil is misused over decades by general public for various uses, it’s always been publicized by celebrities and media as a wonder medicine and misinformation is given to public leading to rampant use camphor oil. Medical literature has shown toxic effects of camphor use in the past but no studies have been conducted to prove...
its addiction and features of toxicity. This study highlights side effects of camphor addiction and need of proper guidelines on camphor sales and its use by general public.

References