Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/17749
DOI URL: http://dx.doi.org/10.21474/IJAR01/17749

RESEARCH ARTICLE

PULMUNARY OEDEMA DUE TO PEPPERMINT OIL POISONING : A CASE REPORT

Dr. Jyoti Verma
Associate Professor, DepartmentofMedicineDr. Ram Manohar Lohia Institute of Medical Sciences, Gomtinagar, Lucknow, UP.

Manuscript Info

Manuscript History
Received: 25 August 2023
Final Accepted: 27 September 2023
Published: October 2023

Key words:-
Menthol, Pulegone, Atonia, Neurotoxic

Abstract

A case is reported where a patient, after ingestion of Peppermint Oil,developedrespiratory distress, altered sensorium and was in shock on arrival in hospital. Clinically and radiologically, patient appeared to be having acute Pulmonary Oedema.Timely and appropriate measurements like intubation, mechanical ventilation, inotropes, gastric lavage,antibiotics,and antacids helped patient to recover.We present a rare case of pulmonaryoedema following peppermint oil ingestion.

Introduction:-

Peppermint (Mentha x piperita) is a perennial flowering member of the mint family, which grows widely in Europe and North America. Extracts of peppermint are widely used as flavoring (rather than for their medicinal properties) in many products, including toothpastes, mouthwashes, and over-the-counter gastrointestinal (GI) products. Menthol, which is extracted from peppermint, is a common ingredient in over-the-counter topical products used for respiratory congestion, headache, and muscle pain.

The active constituents in peppermint oil, which is prepared through distillation of the ground parts of the peppermint plant, include menthol, menthone, cineol, and several other volatile oils.[1]Peppermint oil should not be used internally or on or near the face in infants and young children because of its potential to cause bronchospasm, tongue spasms, and, possibly, respiratory arrest.[1]

In vitro research shows peppermint oil to be effective in relaxing GI smooth muscle, possibly through an antagonistic effect on calcium channels in the gut.[2] Peppermint oil also has been shown to relax the lower esophageal sphincter, which can result in gastroesophageal reflux.[3]Like many essential oils, peppermint oil can be toxic and even lethal at excessive dosages; it has been associated with interstitial nephritis and acute renal failure[4], but presentation as Pulmonary oedema after ingestion, has not been found in literature despite extensive search. Though, there is one case report of Pulmonary Oedema developing after IV Peppermint.[5]

Case Report

A 50 yearold female patient was brought to the emergency room in gasping state.She was in state of shock and froth was coming from the mouth.A strong smell of mint was emanating from her body. There was history of having ingested approximately 5-10 ml of peppermint oil about 30 minutes earlier. She belonged to the household where they grow Peppermint and extract the oil at home.

Corresponding Author:- Dr. Jyoti Verma
Address:- Department of MedicineDr.Ram Manohar Lohia Institute of Medical Sciences, Gomtinagar, Lucknow, Uttar Pradesh, India.

On clinical examination,she had cold and clammy skin. BP was not recordable,pulse impalpable and pupils were bilaterally dilated,not reacting to light.Temperature was 98.6F.Heart was beating at 130 bpm,RR was 10/min,oxygen saturation was 42%. She had Glasgow Coma Scale (GCS) of 3. On auscultation of chest,there werebilateral extensive crepitations and rhonchi. Examination of CVS and ECG did not reveal any abnormality except tachycardia.

She was immediately intubated and put on ventilator on SIMV mode.Gastric lavage was done with normal saline usingthin naso-gastric tube and bladder catheterised. As BP did not improve, Dopamine infusion was started at 2 microgram/kg/min and gradually increased to 10 microgram/kg/min.

Central venous line was inserted and CVP monitored. Prophylactic IV antibiotics (Ceftriaxone and Metronidazole)were started and other supportive treatment including steroidswere given. Later Dobutamine and Noradrenaline infusion were also required to maintain B.P.

Her ventilator setting was changed to CPAP(Fio2-21),PASB-10,PEEP(14) as SIMV was not producing any improvement. With this, her BP reached 108/80 mm Hg, pulse 92/min, Sao2 100%. An X-Ray Chest (portable, AP view) showed bilateral diffuse soft opacities (Figure 1)

After about 12 hours, her pupils started to react sluggishly to light. She started showing gradual improvement on GCS. On the 2nd day, Patient became conscious and started following commands.BP was maintained so vasopressor support was gradually withdrawn. Clinically, crepitations and rhonchi gradually reduced from 2nd day onwards. She was taken off ventilator on 3rd day and put on T-piece.She was found to be having hypokalaemia from Day 3 onwards that was gradually corrected with treatment. Finally on 4th day, she was extubated and was put on face mask with oxygen at 3 litre/min.

On 5th day she was able to maintain SPO_2 without oxygen.She complained of cough and hoarseness of voice. Otorhinlaryngiologist's opinion was taken.Her vocal cords were found to be congested and swollen,so antihistaminics were added.By this time, most of her biochemical parameters had returned to normal and repeat X-Ray Chest revealed almost total clearance of opacities.

Psychiatric opinion was also taken and antidepressant was started with advice of regular follow up.

Various Laboratory Findings During Admission-

ABG findings-

	Day 1	Day 2	Day 3	Day4	Day 5
pH	7.26	7.48	7.46	7.3	7.41
pCo2	38	29	36	35	39
pO2	205	208	55	88	124
HCo3	16.8	21.5	25.3	25.4	23
Sao2	99%	88%	100%	98%	99%

	DAY1	DAY1	DAY3	DAY4	DAY5	DAY6	DAY7	DAY8
TLC	28,800	18,000	10,000	7800	6800	6600	7300	8100
S.BIL.	0.9	1	0.6	1.1	0.8	0.6	0.5	1.0
SGOT	18	20	26	12	18	22	30	23
SGPT	23	29	18	16	25	28	34	21
S.NA+	142	136	122	134	125	144	134	141
S.K+	3.5	4.5	3.3	2.87	2.7	3.83	4.62	4.5

Discussions:-

A case of oral Peppermint oil ingestion (with suicide intent) was encountered. We received the patient in comatose state probably because of hypoxemia due to acute pulmonary oedema, or because of direct toxic effect of Peppermint oil on brain. Peppermint oil has over 30 known components[7].

The active constituents in peppermint oil, which is prepared through distillation of the ground parts of the peppermint plant, include menthol(35-60%), menthone(15% to 30%), cineol, and several other volatile oils[1].It also contains pulegone, a known neurotoxic agent[8].

A case has been reported where a 58 years old women, who smoked heavily, changedto menthol containing cigarettes. After three months she became irritable and quarrelsome, in contrast to her former placid good natured state, and had gastrointestinal upset with occasional vomiting. Her speech became thick and she developed a tremor of the hand and an unsteady gait. On one occasion mental confusion and depression occurred and she was admitted to a hospital with a toxicpsychosis that was considered to be due to mentholaddiction. Within 17 days of the withdrawal of mentholcigarettes, she became normal in every respect without specific treatment[9].

Rats treated with pugelone developed dose dependent atonia. As in vitro research shows peppermint oil to be effective in relaxing GI smooth muscle[2], it has been tried in treatment of Irritable Bowel Syndrome (IBS). The therapeutic dosage range studied in most IBS trials was 0.2 to 0.4 mL of peppermint oil taken three times daily in enteric-coated capsules. The dosage used in the single clinical trial in children was 0.1 mL three times daily for children weighing less than 45 kg (99 lb, 3 oz)[6].

Peppermint oil had been previously reported to be hepatotoxic[8,11] and nephrotoxic[10]. Hepatotoxicity is attributed to the presence of pulegone, which is a recognized hepatotoxin[8] but in this patient there was no toxic effect to liver or kidney,probably due to difference in amount of oil ingested in this patient and others.

Another case is on record where acute lung injury followed IVinjectionof peppermint oil[5]. That was an 18 year old womenwho developedfulminant pulmonary edema,presumably duetodirect toxicity andresultantant increase in pulmonaryvascularpermeability.

Peppermint oil has been known to cause vasoconstriction[8], but in this patient we found profound hypotension (shock) which was possibly secondary to hypoxia following pulmonary oedema. In previously reported case of Peppermint poisoning, pulmonary oedema followed IV injection[5]. In this patient, it appears that some quantity of the oil was also aspirated; aspiration being a known complication of swallowing oily substances. Also, being a highly volatile oil, it is possible that vapours caused direct injury to lung.

Even though Peppermint oil has many medicinal uses,it is toxic mainly to brain and lungs if taken in excess quantity. Although it is stipulated that in cosmetic formulations the concentration of pugelone be kept 1% or lower, but it is often found in the range of 1% to 4%[8]. The case presented above, also highlights that rapid /near-fatal pulmonary oedema can also develop with ingestion of Peppermint oil, because of high risk of aspiration. The oil, in itself, is highly toxic. Therefore,a warning statement should be put on bottle of peppermint oil and it should not be sold in market, without adequate measures to prevent its misuse.

References:-

1.Blumenthal M. Herbal Medicine: Expanded Commission E Monographs. 1st ed. Newton, Mass.: Integrative Medicine Communications, 2000.
2. Hills JM, Aaronson PI. The mechanism of action of peppermint oil on gastrointestinal smooth muscle. An analysis using patch clamp electrophysiology and isolated tissue pharmacology in rabbit and guinea pig. *Gastroenterology*. 1991;101:55–65.
3. Brinker FJ. Herb Contraindications and Drug Interactions: With Appendices Addressing Specific Conditions and Medicines. 2nd ed. Sandy, Ore.: Eclectic Medical Publications, 1998
4. Schulz V, Hänsel R, Tyler VE. Rational Phytotherapy: A Physician's Guide to Herbal Medicine. 3rd ed. New York, N.Y. :Springer, 1998.
5.Matthias Behrends, Martin Beiderlinden, Jürgen Peters.Acute Lung Injury After Peppermint Oil Injection. AnesthAnalg; 101 (2005) :1160-1162

6. Liu JH, Chen GH, Yeh HZ, Huang CK, Poon SK. Enteric-coated peppermint-oil capsules in the treatment of irritable bowel syndrome: a prospective, randomized trial. *J Gastroenterol*. 1997;32:765–8.
7.Nair B. Final report on the safety assessment of Mentha Piperita (Peppermint) Oil, Mentha Piperita (PepperminLeaf Extract, Mentha Piperita (Peppermint) Leaf, and Mentha Piperita (Peppermint) Leaf Water. Int J Toxicol.2003;20(Suppl3):61–73.t)
8.Herro E, Jacob SE. Mentha piperita (peppermint) Dermatitis. 2010;21:327–9.
9..Luke, E. (1962). Addiction to mentholated cigarettes. Lancet,i, 110.
10.Kligler B, Chaudhary S. Peppermint oil. Am Fam Physician. 2007;75:1027–30.
11.Akdogan M, Ozguner M, Aydin G, Gokalp O. Investigation of biochemical and histopathological effects ofPeppermint piperita Labiatae and Peppermint spicata labiatae on liver tissue in rats. Hum Exp Toxicol.2004;23:21–8.