



A Rare case report of Angioedema Secondary to Contact with Kerosene

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Abstract: Commercial petroleum products such as gasoline, kerosene and fuel oils are complex mixtures of hundreds of different hydrocarbons. Dermal exposure to such agents may lead to damaging effects on the skin barrier and may causes local effects like skin irritation, inflammation, skin corrosion and burn like injuries. Although there have been reports on effect of dermal exposure to kerosene, to the best of our knowledge no case has been reported regarding the exposure of oral mucosa to kerosene. Here, we present a unique case of angioedema of lips caused due to use of kerosene as a mouthwash.

Keywords: Angioedema, Kerosene, Petroleum products

Introduction: Angioedema is a diffuse edematous swelling of the soft tissues commonly involving the subcutaneous and submucosal connective tissue. It is of two types hereditary and acquired angioedema. Acquired angioedema is an IgE mediated allergic reaction that is precipitated by drugs or foods. These substances may act as antigens that elicit IgE production. On antigenic re-challenge, mast cells bind with IgE in the skin or mucosa which in turn causes the release of histamine and other vasoactive substances in mast cells to cause diffuse edematous swelling.¹

Kerosene is a heterogeneous hydrocarbon substance that has been used worldwide. It has been used for various purposes such as cooking, heating, lighting, also as fuel, oil glazing agent, insecticide, etc. However, it is known to cause harm to various body organs and systems. It is also well known to cause dermal irritation, skin lesion and dermatitis.² Studies have shown that kerosene can compromise the function of dermal barrier and the ability of the skin to retain water thereby increasing the absorption of carcinogens. The occurrence of dermatitis may be due to extraction of endogenous skin lipids, while increases in pro inflammatory cytokines and formation of oxidative stress that promote dermal inflammation.³ To the best of our knowledge, there are no case reports or literature available on kerosene causing oral mucosal changes although literature is available on effects of kerosene on skin.

Presentation of case: A 71-year-old male patient came to the Department of Oral Medicine and Radiology with a chief complaint of swelling in upper and lower lip since a day. Patient gave a history of tooth pain in upper left back tooth region since 2 days which was sudden in onset, continuous and severe in intensity. Patient took analgesics from a local pharmacy but there was no relief in pain. Patient then swished his mouth with kerosene for around 10 minutes on the left side for relief of pain. After few hours patient developed itching and burning sensation on tongue and left buccal mucosa. The patient then noticed swelling of both upper and lower lip which gradually increased to the present size. Patient had not applied any ointment or taken medication for the swelling. There was no previous history of swelling. Medical history and family history were non-contributory and it was his first dental visit. Patient also had habit of smoking 3-4 bidi per day since 30 years and alcohol once a week since 30 years.

On general physical examination patient was moderately built and nourished with erect posture. No abnormalities were detected on skin, eyes and other parts of the body. There were no signs of urticaria or other allergic reaction. Vital parameters were in normal range.

On extra oral examination, there was diffuse swelling present of the upper and lower lip. Surface of swelling appeared stretched, erythematous and smooth [fig1a]. Intraorally, there was diffuse erythema of left buccal mucosa with some areas of slough. The buccal mucosa was edematous and surface had granular appearance [fig1b]. On palpation of left buccal mucosa, there was tenderness and burning sensation present. It was soft in consistency.

On routine examination Grade III mobility was present w.r.t 28. Grade II mobility w.r.t 31, 32 grade I mobility w.r.t 33 18. Generalized gingiva recession and generalized bleeding on probing were also present.

Correlating the history and clinical examination, working diagnosis of Angioedema of upper and lower lip secondary to contact of kerosene was given. Hematology report was advised and was within normal range.

Patient was given tablet Levocetirizine 5mg and oral prednisolone 20mg twice daily for 7days. Patient was recalled after 3 days. On examination, there was significant reduction in the size of swelling [fig2]. Patient was advised to continue tablet. Prednisolone 10mg once daily for 4 days. Patient was recalled after 4 days. On examination, there was complete resolution in size of swelling [fig3]. Based on this final diagnosis of Angioedema of upper and lower lip secondary to kerosene usage was given.



Figure1a: 1st visit, shows diffuse swelling of upper and lower lip with melanin pigmentation. Surface of swelling is stretched and shiny, erythematous and smooth. Figure 1b:The buccal mucosa was edematous and surface had granular appearance

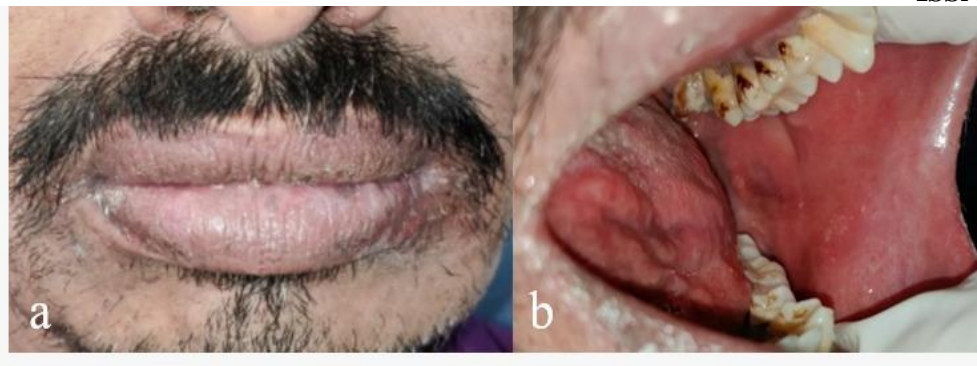


Figure 2a: On the 3rd day of follow up, there was significant reduction in size of swelling on both upper and lower lip. Figure 2b: There was small erythematous area on buccal mucosa



Figure 3a: On the 7th day, there was complete resolution in size of swelling on both upper and lower lips. Figure 3b: Buccal mucosa appears to be normal.

Discussion: Angioedema is characterized by rapid development of edematous swelling, particularly of the head and neck. It occurs when blood vessels deep in the subcutaneous tissue are affected, producing large diffuse area of subcutaneous swelling under normal overlying skin. This reaction may be caused by contact with a known allergen. Its onset may be idiopathic or the result of diverse course such as nonsteroidal anti-inflammatory drugs, antibiotic, insect bites, food, etc. A significant number of such cases are idiopathic. Symptoms usually start to develop in a minute to an hour after the exposure to the allergens. It often affects the lips, eyelids, face, tongue, larynx, or bowel and often large, well demarcated lesions that typically resolve 2-3 days but may last 5-7 days.⁴ There is a risk of edema of the tongue, the larynx and the trachea, which can lead to airway obstruction and death, therefore tracheostomy is indicated⁵. For determining allergy as the etiology of angioedema, taking proper history of any change of diet as well as

medical history is important as well as to determine the potential triggering factors. Family history has to be taken in order to exclude any hereditary components. Treatments for angioedema are dependent on the underlying cause and may include antihistamines, corticosteroids, epinephrine, etc.

Kerosene is a complex mixture of paraffins (55.2%), naphthenes (40.9%) and aromatic hydrocarbons (3.9%) and there is no definitive absorption, distribution, metabolism data of hydrocarbon.³ Major route of exposure to kerosene is inhalation, oral ingestion, ocular or dermal routes.^{2,6} It causes pulmonary toxicity, neurotoxicity, hepatic toxicity, etc. Dermal exposure to kerosene causes drying, cracking, etc. There may be transient pain with erythema, blistering and superficial burns. Dermal effects includes compromised dermal barrier, irritation, sensitization, skin lesions, oil acne, dermatitis, burns, etc.¹ Recent studies conducted using vitro and vivo mice models by LaDow et al showed that kerosene treatment compromised dermal barrier function and the ability of the skin to retain water and enhances carcinogen absorption.⁷ Other studies have found that kerosene causes dermal irritation and sensitization, skin lesions and dermatitis.^{2,3} The occurrence of dermatitis may be attributed to the extraction of endogenous skin lipids, which increases in pro-inflammation cytokines and formation of oxidative stress promote dermal inflammation.³

Studies have suggested that the use of refined fossil fuels, particularly kerosene, for cooking and heating increases the risk of allergy and symptoms of allergic disease although the exact mechanism is unknown.⁸ Hydrocarbons appear to be absorbed equally well through the skin, lungs, and gastrointestinal tract, and may give rise to generalized constitutional symptoms involving all organs, especially the central nervous system, lungs, blood and blood-forming organs, and kidneys.⁹ It has also been suggested that depending on the dose and type of kerosene used, some CNS abnormality may be present following kerosene ingestion, without pulmonary involvement. It appears that the liver and other tissues trapped sufficient kerosene even at mild dose to preclude any cerebral or pulmonary pathology. Larger doses (105 ml/kg instantaneously absorbed) also penetrate the cerebral capillary bed and be trapped in the microcirculation of the lung, giving rise to a pathologic process indistinguishable from that seen following intratracheal aspiration.⁹

To our best knowledge, there are no case reports or literature available on kerosene causing oral mucosal changes although literature is available on the effects of kerosene on skin.

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Here, we reported a case of angioedema of upper and lower lips caused due to contact of kerosene. The diagnosis of angioedema due to contact of kerosene was given by excluding other causes. There was no history of similar swelling before and no history of insect bites, food allergy, allergy to medications, or change in food habits, or any oral hygiene aids.

Conclusions: This article highlights the occurrence of angioedema of lips due to contact with kerosene. Petroleum products may be considered as one of allergens that can cause angioedema. Awareness should be made to the public of its danger and also to the dental profession of such occurrence and how to manage it.

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Consent: Consent from patient was taken

References

1. Allen P.K Angioedema. A review article. WAO Journal 2008. June;108-113.
2. Geoffrey K.Maiyoh, Rachel W. Njoroge, Vivian C.Tuei : Effects and mechanisms of kerosene use-related toxicity. Environmental Toxicology and Pharmacology 2015;40(1)57-70.
3. Ritchie G et al, Biological and health effects of exposure to kerosene- based jet fuels and performance additives.JToxicol Environ Health B Crit Rev, 2003.6(4):357-451.
4. FlorimCuculi, Yves Suter, Paul Erne. Angioedema of the tongue. CMAJ 2018;178(9):1136
5. TomislavDuvancic, LiborijaLugovic – Mihic, Ante breklo, MirnaSitrumand Ana Sinkovic: Prominent features of allergic angioedema on oral mucosa. ActaClin Croat 2011; 50:531-538
6. Nicholas L. Lam a , Kirk R. Smith a , Alison Gauthier a & Michael N. Bates Kerosene: A Review of Household Uses and their Hazards in Low- and Middle-Income Countries. Journal of Toxicology and Environmental Health, Part B: Critical Reviews,2012; 15(6), 396-432.
7. Kathy LaDow, Brenda L Schumann, NocoléLuse, davewarshwsky, et al. Acute treatment with kerosene Damages the Dermal Barrier and Alters the distribution of Topically applied Benzo(a) pyrene in Mice.Journal of Occupational and Environment Hygiene. December2011;8:701-708.

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8. Andrea j. Venn, Haile Yemaneberhan, Yegeye Bekele, Sarah A. Lewis, Eldryd Parry, and John Britton. Increased Risk of Allergy Associated with the Use of Kerosene Fuel in the Home. *American Journal of Respiratory and Critical Care Medicine*.2001;164.
9. W.B Deichmann, K. V Kitzmiller, S. Witherup, RalpJohansmann. Kerosene intoxication: An experimental approach to the etiology of the CNS manifestations in primates. *Anal of Internal Medicine*, 1944;21(5),803-823.