Stevens-Johnson syndrome (SJS) following murunga leaf (*Moringa oleifera*) consumption

E W R A Witharana[1], W M G A S T B Wijetunga[2], S K J Wijesinghe[1]

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Introduction

Stevens-Johnson syndrome (SJS) is a rare but potentially fatal condition characterized by erythematous macules evolving to epidermal detachment and mucous membrane erosions. Though it is predominantly known as a medication-induced disease, some cases are related to infections (*Mycoplasma pneumonia, Herpes simplex*) [1]. More than 100 agents of drugs have been reported as potential causes [2]. Allopurinol, carbamazepine, lamotrigine, nevirapine, non-steroidal anti-inflammatory drugs (meloxicam), phenobarbital, phenytoin are drugs well known to cause SJS [2]. Human immune deficiency Virus (HIV), malignancy, systemic lupus erythematosus, radiotherapy, collagen vascular disease, ultraviolet light, genetic factors, and underlying immunologic disease are other rare predisposing conditions of SJS [3]. A few other cases remain unexplained [1].

We report a case of SJS presented after consumption of *Moringa oleifera* (Murunga) leaves. To the best of our knowledge, this is the first reported case published for SJS associated with *Moringa oleifera* (Murunga) consumption in Sri Lanka. However, Moringa leaves are reported to be rich in phenolics and antioxidants like vitamin C, B and A. Those components were mainly studied and documented their antioxidant, anti-inflammatory, antimutagenic or anticancer properties [4]. Cosmetic products containing extracts from Moringa tree are popular in the West.

Case report

A 53-year-old gentleman was admitted to the medical ward of the Base Hospital Deniyaya, Sri Lanka with fever, rash and pain full oral ulcers for 2 days. He was a known diabetic and hypertensive patient, on metformin and enalapril for 5 years. Fourteen hours after consumption of food con-taining Murunga (*Moringa oleifera*) leaves, he developed fever and generalized macular popular rash. The next day, painful ulcers appeared in the mouth with difficulty in swallowing, and he was admitted to the hospital. Three months ago he had similar episode of oral ulcers after consumption of a curry prepared from *Moringa oleifera* leaves. Examination revealed extensive muco-cutaneous lesions with blister formation over face, mouth, chest, abdomen and genitalia. Blood pressure was 130/80

Figure 3. **(a) and (b) Multiple muco-cutaneous lesions over body and mouth. (c) *Moringa oleifera* leaves, flowers and fruit.**

[1]*Base Hospital, Deniyaya, Sri Lanka,* [2]*Department of Biological Sciences, Faculty of Applied Sciences, Rajarata University of Sri Lanka, Mihinthale.*

Correspondence: EWRAW *e-mail: <elapathawitharana@gmail.com>.* *Received 03 October 2018 and revised version accepted 03 October 2018.*

mmHg and pulse rate was 82/min. Blood investigations done 24 hours after the incident provided the following: white blood cell count-12,500,000×10^{12}/L (neutrophils 90%), haemoglobin-15.3g/dl, platelets-260,000×10^{12}/L, serum creatinine-0.9 mg/dl, alanine transaminase (ALT) - 34U/L, and aspartate transaminase (AST) - 26U/L. Fasting blood glucose was 344 mg/dl on admission. In addition to metformin and enalapril he had been given oral prednisolone and omeprazole as initial treatment. He recovered completely after 2 weeks and blood sugar was normal.

Discussion

Fast-growing, drought-resistant *Moringa oleifera* (Lam) of the genus Moringa, which is the only genus in the family Moringaceae, is widely cultivated in tropical and subtropical areas [4]. The tree has an open crown, fragile branches, feathery foliage of tripinnate leaves and hanging capsular fruit. Common English, Sinhala and Tamil names are drumstick tree or horseradish tree, Murunga and Murungamaram respectively. Immature fruits and leaves are widely consumed as food by human whereas whole plant (e.g. bark, fruit, leaves, nuts, seeds, tubers, roots, flowers) is used as herbal medicine by rural community.

Moringa oleifera leaves are rich in protein, mineral, beta-carotene and antioxidants and are added to food preparations as integrators of the diet. In traditional medicine, these leaves, seeds, barks, roots, flowers are used to treat several ailments including malaria, typhoid fever, parasitic diseases, arthritis, swellings, toothache, genito-urinary ailments, anaemia, hypertension and diabetes. Moringa seed powder are used for water purification [4]. Vitamins, carotenoids, polyphenol, phenolic acids, flavonoids, alkaloids, glucosinolates, isothiocyanates, tannins, saponins and oxalates and phytates are bioactive compounds recognized in the leaves [4].

Pharmacology of *Moringa oleifera* is studied extensively and the leaves have been found to have antioxidant, anti-inflammatory and imuno-modulatory, and anticancer properties [4]. Nfambi *et al*. evaluated the immunomodulatory effect of *Moringa oleifera* leaves in cyclophosphamide-induced immunodeficient Wistar albino rats. They found that *Moringa oleifera* leaves extract had shown a significant increase in white blood cells and serum immunoglobulins, suggesting that it stimulate both cellular and humoral immune responses [5].

The pathogenesis of SJS is not fully understood but is believed to be delayed hypersensitivity reaction mediated by Th1 cells. The histopathological hallmark of the diseases is widespread epidermal necrosis due to keratinocyte apoptosis [2]. The immunomodulatory effect of *Moringa oleifera* may be associated with pathogenesis of SJS in this case.

This case report suggests that consumption of Moringa leaf is better avoided by individuals who are at risk of developing SJS. On the other hand it is important to remember that Moringa is a very useful and widely used plant as a human food since ancient time.

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