IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

ANCIENT REMEDY, MODERN REACTION: AYURVEDIC PRODUCT – INDUCED STEVENS-JOHNSON SYNDROME

First Author: Amrutha J A[1], Josina Joseph[1], Pharm D Intern, Department of Pharmacy Practice, Ezhuthachan College of Pharmaceutical Sciences, Marayamuttom, Trivandrum

Corresponding and Second Author: Dr. Reshma Babu[2], Assistant Professor, Department of Pharmacy Practice, Ezhuthachan College of Pharmaceutical Sciences, Marayamuttom, Trivandrum.

Third author: Dr. Drishya L[3], Associate Professor, Department of Pharmacy Practice, Ezhuthachan College of Pharmaceutical Sciences, Marayamuttom, Trivandrum

Fourth author: Prof. (Dr.) Shaiju S Dharan[4], HOD, Principal, Department of Pharmacy Practice, Ezhuthachan College of Pharmaceutical Sciences, Marayamuttom, Trivandrum

ABSTRACT

Stevens-Johnson syndrome is a rare but severe mucocutaneous reaction, often triggered by medication. Ayurvedic medicine, an ancient system of healing practiced for 1000's of years, is widely regarded as natural and holistic approach of health. With the increasing global acceptance of herbal remedies, many individuals turned to ayurvedic products for various ailments, believing them to be free from harmful side-effects. However, the misconception that "natural" means "safe" has led to a growing number of reports highlighting severe adverse reactions linked to these traditional remedies. A 2-year-old female patient presented with fever, itching and skin peel through out the body. She had a medical history of dry skin and was treated with moisturiser for 6 months. Later she developed increased itching. After one week they went to ayurvedic hospital and took medicine (*Arishtam*). Her grand father has psoriasis. After consumption of the ayurvedic medicine, she developed with skin reactions and treated with steroids, antihistamines, antibiotics and creams.

KEY WORDS: Stevens-Johnson syndrome, Ayurvedic product, Mucocutaneous reaction, Pyoderma, Steroids.

INTRODUCTION

Ayurveda, one of the oldest systems of medicine, has been practiced for thousands of years and remains widely used across the world, particularly in South Asia [(1)]. Rooted in the principles of natural healing, Ayurvedic formulations often comprise a combination of herbs, minerals, and other plant-based compounds believed to restore balance within the body [(2)]. With the increasing shift toward alternative medicine, many individuals perceive Ayurvedic products as safe, natural, and free from adverse effects. However, despite their historical significance and widespread use, concerns regarding their safety, efficacy, and potential toxicity have emerged, particularly due to unregulated formulations, lack of standardized dosages, and possible adulteration with harmful substances [(3)].

Stevens-Johnson Syndrome (SJS) is a rare yet life-threatening immune-mediated hypersensitivity reaction that predominantly affects the skin and mucous membranes [(4)]. It is often drug-induced and manifests as widespread erythema, blistering, and necrosis of the epidermis, leading to severe systemic complications [(5)]. The condition is most frequently associated with antibiotics, anticonvulsants, and nonsteroidal anti-inflammatory drugs (NSAIDs) [(6)]. However, recent reports suggest that herbal and Ayurvedic medicines may also contribute to severe cutaneous adverse reactions, raising concerns about their safety and the need for greater pharmacovigilance [(7)].

The mechanism of Ayurvedic product-induced Stevens-Johnson Syndrome (SJS) is not fully understood but is believed to involve a complex immune-mediated hypersensitivity reaction triggered by bioactive compounds, contaminants, or adulterants present in the formulation [8]. Many Ayurvedic remedies contain a mix of herbs, metals, and unidentified compounds, which may act as haptens, binding to host proteins and modifying immune recognition [9]. This can lead to the activation of drug-specific cytotoxic CD8+ T cells and natural killer (NK) cells, resulting in widespread keratinocyte apoptosis. Additionally, Ayurvedic formulations may contain unregulated synthetic drugs, heavy metals, or allergens, which can trigger T-cell-mediated hypersensitivity and excessive cytokine release, including interferon-gamma (IFN-γ) and tumor necrosis factor-alpha (TNF-α) [10]. These inflammatory mediators stimulate Fas-Fas ligand (FasL) interactions and the release of granulysin, perforin, and granzyme B, leading to extensive epidermal necrosis and mucosal ulceration [11]. Furthermore, the lack of quality control, improper dosing, and potential contamination with known SJS-inducing agents (such as NSAIDs, antibiotics, or corticosteroids) in some Ayurvedic products increases the risk of severe cutaneous adverse reactions [12]. The unpredictable metabolism of herbal components and their interaction with conventional medications may further exacerbate the immune response, ultimately causing severe epidermal detachment, systemic inflammation, and multi-organ complications [13]. This highlights the urgent need for pharmacovigilance, regulatory oversight, and clinical validation of Ayurvedic medicines to ensure their safety and prevent life-threatening reactions like SJS [14].

Stevens-Johnson Syndrome (SJS) is primarily caused by adverse drug reactions, with antibiotics (sulfonamides), anticonvulsants (carbamazepine, lamotrigine, phenytoin), NSAIDs, and allopurinol being the most common triggers. In rare cases, herbal and Ayurvedic medicines have also been implicated, possibly due to unknown bioactive compounds, contaminants, or heavy metals that induce immune hypersensitivity [15]. Infections such as Mycoplasma pneumoniae, herpes simplex virus, and HIV can also trigger SJS, especially in children. Genetic susceptibility, particularly the presence of HLA-B15:02 and HLA-B58:01 alleles, increases the risk of drug-induced SJS [16].

The initial symptoms of SJS are nonspecific flu-like signs, including fever, sore throat, cough, malaise, and body aches. Within a few days, painful, erythematous macules and target-like lesions appear on the skin, rapidly progressing to blisters, epidermal detachment, and widespread skin necrosis [17]. Mucosal involvement is a hallmark feature, leading to severe conjunctivitis, painful oral ulcers, swollen lips with hemorrhagic crusting, and genital ulcerations [18]. Patients may experience difficulty swallowing, photophobia, and respiratory distress if the airway mucosa is involved. The detachment of large skin areas results in fluid loss, electrolyte imbalance, and increased risk of secondary infections, which can lead to sepsis, multi-organ failure, and death in severe cases like Toxic Epidermal Necrolysis (TEN). Early recognition and immediate discontinuation of the offending agent, along with supportive care, are crucial for improving patient outcomes [19].

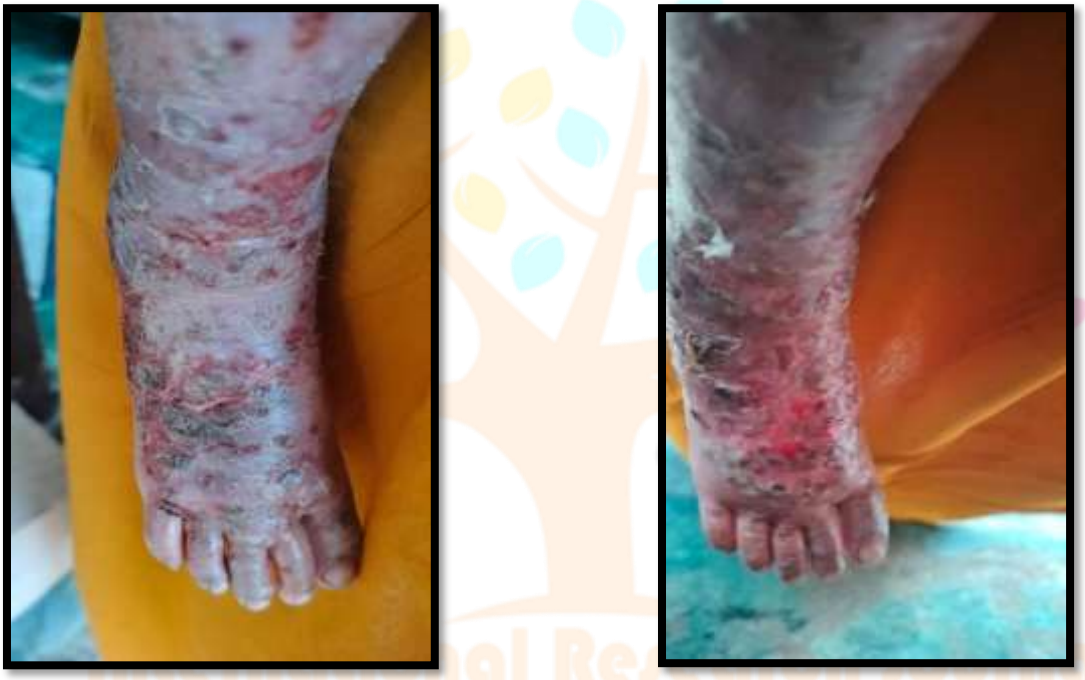
The diagnosis of Stevens-Johnson Syndrome (SJS) is primarily clinical, based on the characteristic presentation of mucocutaneous lesions, epidermal detachment, and systemic symptoms [20]. A thorough history of recent drug exposure, herbal or Ayurvedic product use, or infections is essential for identifying potential triggers. Skin biopsy is the gold standard for confirmation, revealing keratinocyte apoptosis, epidermal necrosis, and lymphocytic infiltration [21]. Additional laboratory tests, including complete blood count (CBC), liver and renal function tests, C-reactive protein (CRP), and serum electrolyte levels, help assess systemic involvement. If an infectious cause is suspected, polymerase chain reaction (PCR) or serologic testing for Mycoplasma pneumoniae and viral infections may be performed [22].

The primary treatment for SJS involves immediate discontinuation of the offending drug or Ayurvedic product and providing supportive care in an intensive care unit (ICU) or burn unit [23]. Patients require fluid and electrolyte management, pain control, wound care, and prevention of secondary infections. Systemic corticosteroids, such as methylprednisolone, may be used in the early stages to reduce inflammation, but their benefits remain controversial [24]. Intravenous immunoglobulin (IVIG) is sometimes administered to block Fas-mediated apoptosis, while cyclosporine has shown promise in reducing mortality by inhibiting T-cell activation. Plasmapheresis may be considered in severe cases to remove circulating immune complexes [25]. Ophthalmologic evaluation and supportive eye care are crucial to prevent long-term complications like corneal scarring and blindness. Early diagnosis and aggressive supportive management significantly improve survival rates and reduce the risk of multi-organ failure and long-term sequelae [26].

CASE REPORT

A 2-year-old female patient was admitted to paediatric department with complaints of fever, itching and skin peel throughout the body. She had a medical history of dry skin and was treated with moisturiser for 6 months. Later she developed increased itching. After one week they went to ayurvedic hospital and took medicine (*Arishtam*). After consumption of the ayurvedic medicine, she developed this condition. Her grandfather has psoriasis. On clinical

examination, pyodermal lesions, skin rashes, redness, pus and blood oozing on bilateral elbow and lower limb. WBC (24,050 cells/cumm), Eosinophils (17.0%), Lymphocytes (55%), CRP (59.9mg/L) were elevated and T. protein (4.9mg/dL), serum albumin (2.5mg/dL), Hb (10.7g/dL) and neutrophils (22.3%) were declined. The patient developed these symptoms and was presented to the hospital. As the child is only 2 years parents, didn't cooperate with blood assay. The patient was treated with INJ. CEFTRIAXONE 500mg IV BD, SYP. PARACETAMOL 5ml (120mg/5ml) Q6H, MULTIVITAMIN DROPS 1ml P/0, MUPIROCIN CREAM L/A TDS, SALINE COMPRESS, SYP. ZINC DRY POWDER 1ml OD, SYP. HYDROXYZIN 3ml TDS, CALAMINE LOTION L/A BD, FUSICIDIC ACID + HYDROCORTISONE ACETATE CREAM L/A BD, SYP. PREDNISOLONE 5ml BD. After 6 days, the patient was symptomatically improved and discharged with SYP. PREDNISOLONE 5ml BD, FUSICIDIC ACID + HYDROCORTISONE ACETATE CREAM L/A BD, MUPIROCIN CREAM L/A TDS, SYP. CEFPODOXIME 2.5ml (100mg/5ml) X 5days, SYP. HYDROXYZIN 3ml TDS, MULTIVITAMIN DROPS 1ml P/0 and protein rich diet. The case is presented after proper consent from the parents of the child and institutional research board.



DISCUSSION

A 10-year-old Indian male developed SJS after consuming an herbal medication prescribed by a traditional healer for fever. The child presented with severe mucocutaneous oral ulcerations, ocular manifestations, and dehydration. This case underscores the potential risks associated with herbal treatments in pediatric populations.

A 17-year-old female, undergoing Ayurvedic treatment for mental retardation over 12 years, suddenly developed SJS. The rapid onset of symptoms suggests a possible link to the long-term use of the Ayurvedic preparation, highlighting the need for vigilance even with prolonged use.

A 77-year-old man developed SJS after consuming a herbal medicine containing deer antler, ginseng, and camphor. This case illustrates that specific herbal component, individually considered safe, may collectively trigger severe reactions.

The aforementioned cases illustrate that Ayurvedic and herbal products, often perceived as natural and safe, can induce severe adverse reactions like SJS.

Stevens-Johnson Syndrome (SJS) is a severe hypersensitivity reaction, and emerging reports suggest Ayurvedic products may trigger it. Herbs like Ashwagandha, Guduchi, and Triphala can modulate immunity, potentially leading to T-cell-mediated toxicity. Contamination with heavy metals or adulterants further increases risk. Cases include SJS after consuming herbal remedies for fever or long-term Ayurvedic treatment. Lack of standardization and self-medication contribute to

unpredictable reactions. Regulatory oversight, quality control, and public awareness are crucial to prevent adverse effects. Ayurveda has therapeutic value, but caution is needed to ensure safe and evidence-based use of herbal formulations.

CONCLUSION

Ayurvedic medicine has been widely used for centuries and is often considered a natural and safe alternative to conventional treatments. However, emerging reports indicate that certain Ayurvedic formulations may trigger severe hypersensitivity reactions, including Stevens-Johnson Syndrome (SJS). The lack of standardization, presence of immunomodulatory herbs, contamination with heavy metals, and adulteration of herbal products increase the risk of unpredictable adverse effects. Cases of SJS linked to Ashwagandha, Guduchi, Triphala, and other herbal formulations emphasize the need for caution when using these products, especially without proper medical supervision.

The increasing number of reported cases suggests that more rigorous safety assessments and regulatory oversight are necessary to ensure the quality and purity of Ayurvedic products. Many herbal remedies lack clear dosage guidelines and clinical validation, making it difficult to predict potential hypersensitivity reactions in individuals with predisposing factors. Additionally, self-medication and the widespread belief that herbal products are inherently safe contribute to increased risks, as people may unknowingly consume substances that could trigger severe immune responses.

To address these concerns, pharmacovigilance, public education, and healthcare provider awareness must be strengthened. Greater emphasis should be placed on screening Ayurvedic formulations for allergens, contaminants, and toxic metabolites that may contribute to adverse drug reactions. Furthermore, integrating evidence-based practices into Ayurvedic medicine can help minimize risks while preserving its therapeutic benefits.

While Ayurveda holds significant promise in holistic healing, it is crucial to recognize that natural does not always mean safe. Ensuring the responsible use, quality control, and scientific validation of Ayurvedic products is essential to prevent life-threatening conditions like SJS. Future research should focus on identifying specific herbal components responsible for hypersensitivity reactions and establishing clear guidelines for their safe consumption. By implementing proper regulations, standardized formulations, and increased awareness, the risks associated with Ayurvedic-induced SJS can be minimized, ensuring both safety and efficacy in traditional medicine.

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