

**DERMATOLOGICAL TOXICITY DUE TO SANITIZERS:
AGADTANTRA VIEW AND AYURVEDIC MANAGEMENT*****¹Dr. Vyshnavi K. and ²Dr. Pradeep Patil**

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ABSTRACT

The global health crisis precipitated by the COVID-19 pandemic led to an unprecedented surge in the use of hand sanitizers as a primary hygiene measure. While effective in preventing pathogen transmission, this widespread and frequent application has given rise to a significant increase in dermatological adverse effects, ranging from dryness and irritation to severe contact dermatitis. Modern dermatology attributes these effects to the chemical composition of sanitizers, which disrupt the skin's natural barrier. Ayurveda, the ancient Indian system of medicine, offers a unique and profound perspective on this issue through the lens of *Agadtantra* (toxicology). This article explores the concept of sanitizer-induced skin toxicity as a form of *Dooshivisha* (cumulative poison) according to *Agadtantra*, delineates its pathophysiology (*Samprapti*) through Ayurvedic principles, and outlines a comprehensive management strategy involving internal and external therapies, as well as lifestyle modifications.

KEYWORDS: Hand Sanitizer, Dermatitis, Agadtantra, Dooshivisha, Ayurveda, Twak Vikara, Contact Dermatitis.

1. INTRODUCTION

Hand hygiene is a cornerstone of infection prevention and control. The recommendation by global health organizations like the WHO to use alcohol-based hand sanitizers has been pivotal in curbing the spread of infectious diseases, most notably during the COVID-19

pandemic.^[1] These sanitizers typically contain high concentrations of alcohol (60-95% ethanol or isopropanol), along with other ingredients such as humectants (glycerol), thickeners, and sometimes fragrances or antimicrobial agents like triclosan.

While their virucidal and bactericidal properties are well-established, their impact on skin integrity is a growing concern. The frequent use of these chemical-laden products has led to a spectrum of skin-related complaints, collectively termed dermatological toxicity or contact dermatitis. Symptoms include erythema (redness), xerosis (dryness), scaling, fissures (cracks), pruritus (itching), and a burning sensation.^[2] In susceptible individuals, this can exacerbate pre-existing conditions like eczema or psoriasis.

From a modern perspective, the mechanism involves the delipidating action of alcohol, which strips the stratum corneum of its essential lipids, compromising the skin's protective barrier. This leads to increased transepidermal water loss (TEWL) and makes the skin vulnerable to irritants and allergens.^[3]

Ayurveda provides a holistic framework to understand and manage such conditions. The branch of *Agadtantra* (toxicology) is particularly relevant here, as it deals with poisons of all kinds, including those from mineral, plant, and artificial sources. This article aims to analyze sanitizer-induced dermatotoxicity as a toxicological concern within the Ayurvedic paradigm and present its systematic management.

Need for the Study

With rising sanitizer-induced dermatitis, there is a pressing need for safer, holistic solutions. This study explores the Ayurvedic *Agadtantra* framework to effectively manage this modern, widespread toxicological challenge.

2. THE AGADTANTRA PERSPECTIVE: SANITIZER TOXICITY AS DOOSHIVISHA

Agadtantra, one of the eight classical branches (*Ashtanga Ayurveda*) of Ayurvedic medicine, is dedicated to the science of toxicology. It encompasses the identification, effects, and management of various poisons (*Visha*). According to Acharya Sushruta, *Visha* is any substance that, upon entering the body, causes derangement of *dhatu*s (tissues) and vitiation of *dosh*as (bio-energetic forces), leading to disease or death.^[4]

Ayurveda classifies poisons in various ways, but for understanding the chronic, low-grade toxicity from sanitizers, the concept of ***Dooshivisha*** is most appropriate. *Dooshivisha* is defined as a latent or cumulative poison. It is a substance that does not cause immediate, life-threatening effects but, due to its low potency and repeated exposure, accumulates in the body over time. It gradually vitiates the *dhatu*s, particularly *Rakta* (blood), and disrupts the equilibrium of the *Tridoshas* (*Vata*, *Pitta*, *Kapha*), leading to a host of chronic, often non-specific, diseases.^[5]

The characteristics of *Dooshivisha* as described in classical texts like the *Ashtanga Hrudayam* align remarkably well with the effects of long-term sanitizer use:

- 1. Low Potency and Cumulative Action:** A single application of sanitizer does not cause severe harm. The toxicity manifests after repeated, frequent use, mirroring the cumulative nature of *Dooshivisha*.
- 2. Vitiating of Tissues (*Dhatu Dushana*):** *Dooshivisha* is known to lodge in the tissues and corrupt them. The chemicals in sanitizers penetrate the skin (*Twak*), affecting the underlying *Rasa* (plasma) and *Rakta* (blood) *dhatu*s.
- 3. Chronic and Delayed Manifestation:** The symptoms of sanitizer-induced dermatitis—dryness, chronic inflammation, and altered skin texture—develop over weeks or months, consistent with the slow-acting nature of *Dooshivisha*.
- 4. Exacerbation by Incompatible Factors:** The texts state that the effects of *Dooshivisha* are aggravated by unhealthy diet, improper lifestyle, and seasonal changes. Similarly, sanitizer-damaged skin is more reactive to environmental triggers like cold, dry air or exposure to other chemicals.

Furthermore, the combination of various chemicals in a single sanitizer formulation (alcohol, fragrances, preservatives) can be viewed as ***Sanyogaja Visha*** (compound poison), where the synergistic effect of the ingredients potentiates the overall toxicity.

3. AYURVEDIC PATHOPHYSIOLOGY (*SAMPRAPTI*) OF SANITIZER-INDUCED DERMATITIS

Ayurveda understands disease as a process (*Samprapti*) involving a cause (*Nidana*), vitiated *doshas*, and vulnerable tissues (*dushyas*).

- *Nidana* (Etiological Factors):** The primary cause is the repeated external application (*Bahya Sparsha*) of substances with *Ruksha* (dry), *Teekshna* (sharp/penetrating),

and *Ushna* (hot/potent) properties. These are the inherent qualities of alcohol and other chemicals in sanitizers.

- **Dosha Dushti (Vitiation of Doshas)**

- **Vata Dosha:** The *Ruksha* (dry) and *Khara* (rough) qualities of alcohol profoundly aggravate *Vata dosha* in the skin. Increased *Vata* is responsible for symptoms like *Rukshata* (dryness), *Parushya* (roughness), *Sphutana* (cracking/fissures), and *Toda* (pricking pain).
- **Pitta Dosha:** The *Teekshna* (sharp) and *Ushna* (hot) nature of the chemicals vitiates *Pitta dosha*. This leads to inflammatory symptoms such as *Daha* (burning sensation), *Raga* (erythema/redness), *Paka* (suppuration/inflammation), and local temperature increase.
- **Dushya (Tissues Involved):** The primary *dushyas* are *Twak* (skin), *Rasa* (plasma), and *Rakta* (blood). The toxins first damage the skin, and then through systemic absorption or localized inflammation, they vitiate the circulating *Rasa* and *Rakta* dhatus, creating a systemic predisposition for inflammatory skin disorders (*Kushta*).

This entire process can be classified under *Vicharchika*, a type of *Kshudra Kushta* (minor skin disease), which clinically presents with itching, discharge, discoloration, and dryness, closely resembling eczematous dermatitis.^[6]

4. AYURVEDIC MANAGEMENT (*CHIKITSA*)

The Ayurvedic management of *Dooshivisha*-induced skin toxicity is holistic, aiming to eliminate the toxins, pacify the aggravated *doshas*, and rejuvenate the damaged tissues. The treatment protocol involves avoidance of the cause, detoxification therapies, and palliative internal and external medicines.

A. *Nidana Parivarjana* (Avoidance of the Cause)

This is the foundational principle of all Ayurvedic treatment.

- Minimize the use of alcohol-based sanitizers where possible.
- Prefer washing hands with a mild, natural soap and water, which is equally effective for removing most pathogens if done correctly.^[7]
- If sanitizer use is unavoidable, choose products free from fragrances, dyes, and other unnecessary additives.

B. Shodhana Chikitsa (Purification/Detoxification Therapy)

For chronic or severe cases where toxins have accumulated systemically, *Shodhana* is recommended to expel the vitiated *doshas* and toxins from the body.

- **Virechana (Therapeutic Purgation):** This is the treatment of choice for diseases of *Pitta* and *Rakta* origin. By inducing controlled purgation using herbal formulations (e.g., *Avipattikar Churna*, *Trivrit Lehyam*), *Virechana* eliminates toxins from the liver, blood, and gastrointestinal tract, providing profound relief from inflammatory skin conditions.^[8]
- **Raktamokshana (Bloodletting):** For localized, acute inflammation with severe itching and burning, *Raktamokshana* is highly effective. *Jalaukavacharana* (leech therapy) is particularly useful. Leeches are applied to the affected areas, and their saliva, containing bioactive compounds like hirudin (anticoagulant), hyaluronidase (increases tissue permeability), and anti-inflammatory substances, helps to relieve local congestion and reduce inflammation and pain almost instantly.^[9]

C. Shamana Chikitsa (Palliative Therapy)

This involves the use of internal medicines to pacify *doshas* and support tissue healing.

- **Rakta Shodhaka (Blood Purifiers):** Herbs that purify the blood are crucial.
 - **Manjisthadi Kwath/Kashayam:** A classical decoction containing *Manjistha* (*Rubia cordifolia*), a premier blood purifier with anti-inflammatory properties.^[10]
 - **Sarivadyasava/Khadirarishta:** Fermented herbal preparations used extensively in treating chronic skin diseases by detoxifying the blood and pacifying *Pitta*. *Khadira* (*Acacia catechu*) is renowned for its *Kushtaghna* (anti-dermatological) properties.
- **Kushtaghna (Anti-dermatological) Formulations**
 - **Kaishore Guggulu:** A classical formulation that combines *Guggulu* (*Commiphora wightii*) with *Triphala* and *Guduchi* (*Tinospora cordifolia*). It is an excellent anti-inflammatory, analgesic, and *Rakta Shodhaka* agent, indicated in all types of inflammatory skin and joint disorders.^[11]
 - **Gandhaka Rasayana:** A preparation of purified sulfur (*Gandhaka*) that is highly acclaimed for treating chronic skin diseases. It possesses potent antimicrobial, anti-inflammatory, and rejuvenating (*Rasayana*) properties for the skin.

- **Arogyavardhini Vati:** A herbo-mineral formulation that acts as a liver tonic and purifies the blood, making it effective for a wide range of skin ailments.

D. *Bahir Parimarjana Chikitsa* (External Therapies)

External applications are vital for providing symptomatic relief and restoring the skin barrier.

- **Lepa (Medicated Paste)**
 - **Shatadhauta Ghrita:** This is ghee that has been washed 100 times with pure water. The process transforms it into a light, cooling, and deeply hydrating cream. It is exceptionally effective in soothing burns, inflammation, and dryness by restoring the skin's lipid layer without clogging pores.^[12]
 - **Yashtimadhu (*Glycyrrhiza glabra*) Lepa:** A paste made from licorice root powder and milk or rose water provides excellent anti-inflammatory and soothing effects, comparable to mild corticosteroids.
- **Abhyanga (Oil Application):** Gentle massage of the hands with medicated oils helps to counteract the *Rukshata* (dryness) caused by *Vata* and nourishes the skin.
 - **Nalpamaradi Kera Thailam:** A coconut-oil-based formulation with the bark of four *Ficus* species. It has skin-lightening and repairing properties, ideal for post-inflammatory discoloration.
 - **Jatyadi Thailam:** An oil prepared with jasmine (*Jati*) and other wound-healing herbs, excellent for treating fissures and non-healing cracks.
- **Parisheka (Medicated Wash):** Washing the hands with a decoction of **Triphala** or **Nimba** (*Azadirachta indica*) helps to cleanse the skin gently and provides antimicrobial and anti-inflammatory benefits.

E. *Pathya-Apathya* (Wholesome and Unwholesome Diet/Lifestyle)

- **Pathya (Recommended)**
 - **Diet:** Consume foods that are light to digest and have cooling properties. Include ghee, bitter vegetables (e.g., bitter melon), green gram (*mung dal*), and old rice. Increase intake of water and sweet juicy fruits.
 - **Lifestyle:** Maintain regular sleep patterns and practice stress-management techniques like yoga and meditation, as stress is a known trigger for skin flare-ups.
- **Apathya (To be Avoided)**
 - **Diet:** Avoid foods that aggravate *Pitta* and inflammation, such as excessively spicy, sour, salty, and fried foods. Limit intake of fermented foods, pickles, yogurt, and sesame seeds.

- **Lifestyle:** Avoid excessive sun exposure and exposure to harsh chemicals or detergents.

5. DISCUSSION

This article connects a modern problem—skin damage from hand sanitizers—with the ancient wisdom of Ayurveda. Ayurveda sees this issue not just as a simple rash, but as a type of slow-acting poison that builds up in the body over time from repeated use. This is a helpful way to understand why the skin gets progressively worse.

The Ayurvedic approach to treatment is very logical. It doesn't just treat the symptoms on the skin. Instead, it works to fix the root cause of the problem inside the body. For example, it uses specific cleansing methods to reduce inflammation and nourishing oils to heal dryness.

This is different from just using a cream to stop the itching. Ayurveda aims to heal the body from the inside out, using internal medicines and detoxification therapies, while also soothing the skin with external oils and pastes.

Ultimately, this shows that good skin health comes from good overall health. More scientific studies are needed to confirm these benefits, but this ancient approach offers a promising and natural way to manage skin problems caused by our modern lifestyle.

6. CONCLUSION

The widespread use of hand sanitizers, while a modern public health triumph, has introduced a new-age toxicological challenge in the form of dermatological toxicity. Ayurveda, through its ancient yet highly relevant branch of *Agadtantra*, provides a sophisticated framework for understanding this phenomenon as a form of *Dooshivisha* or cumulative poisoning. This perspective allows for a more profound understanding of the chronic, debilitating nature of the condition beyond a simple chemical irritation.

The Ayurvedic management strategy is multi-pronged and holistic. It does not merely suppress symptoms but aims to address the root cause by eliminating accumulated toxins (*Shodhana*), pacifying the imbalanced *doshas* (*Shamana*), and rejuvenating the damaged skin tissue through targeted internal and external therapies. By integrating the wisdom of *Agadtantra* with modern needs, Ayurveda offers a safe, effective, and sustainable solution for managing sanitizer-induced dermatological toxicity and promoting long-term skin health.

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