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Original Research Article

Study On Contact Dermatitis Among The Health Care Workers

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Abstract:

Introduction: Contact dermatitis (CD) is a common occupational skin condition among healthcare workers (HCWs), primarily caused by repeated exposure to irritants like disinfectants, gloves, and soaps. This study aims to assess its prevalence, clinical patterns, and risk factors, emphasizing the importance of preventive strategies to safeguard skin health and occupational well-being.

Methods: A prospective study was conducted at GSL Medical College from February to May 2025 among HCWs. Data on demographics, hygiene practices, glove use, and atopy were collected using a structured proforma. Clinical diagnosis and severity grading of CD were performed using standard criteria and HECSI.

Results: Among 134 HCWs, 44% had CD, predominantly irritant type (71.2%). Most affected were females (64.2%) and nurses (36.6%). Common symptoms included hand dryness (69.5%) and itching (64.4%). Significant associations were found with female gender, prolonged glove use, frequent hand washing (HW), and atopy history, highlighting key occupational risk factors.

Conclusion: CD is common among HCWs, particularly females and those with atopy, due to frequent HW and prolonged glove use. Preventive strategies, including barrier protection and moisturization, are vital. Regular monitoring and education can reduce disease burden and protect the occupational health of healthcare professionals.

Keywords: Contact Dermatitis, Healthcare Workers, Occupational, Risk Factor.

Introduction

Contact dermatitis (CD) is a common occupational skin disease among healthcare workers (HCWs), primarily resulting from frequent exposure to irritants such as soaps, disinfectants, and gloves. It is broadly classified into irritant CD (ICD) and allergic contact dermatitis (ACD). ICD accounts for the majority of cases and is mainly due to cumulative skin barrier disruption from repeated hand hygiene practices, while ACD arises from type IV hypersensitivity reactions to allergens like latex, preservatives, and rubber additives in gloves and personal protective equipment (PPE).

The COVID-19 pandemic intensified hand hygiene and PPE usage, leading to a notable rise in CD cases among HCWs. A cross-sectional study in China reported an increased prevalence of hand dermatitis among frontline workers due to prolonged glove use and handwashing practices [1]. Another study in India highlighted that nurses and cleaning staff were especially vulnerable due to frequent exposure to detergents and disinfectants [2]. Risk factors include female sex, atopic history, and prolonged glove use [3]. Preventive strategies include use of alcohol-based hand rubs, appropriate moisturizers, and hypoallergenic gloves [4].

Understanding the prevalence, risk factors, and impact of CD is essential for implementing occupational health policies and education to minimize skin damage and ensure HCW well-being. The current study aims to assess the prevalence, clinical patterns, and associated risk factors of CD among HCWs.

Methods

A prospective observational study was conducted at the department of Dermatology, GSL Medical College, Rajahmundry, over a period of four months from February to May 2025. Prior to the

commencement of the study, ethical clearance was obtained from the Institutional Ethics Committee. Informed written consent was obtained from all participants after explaining the purpose and procedures of the study.

All HCWs, including doctors, nurses, laboratory technicians, and housekeeping staff working in inpatient and outpatient departments, were approached for participation. Those with pre-existing chronic skin conditions unrelated to occupational exposure or those unwilling to provide consent were excluded.

Data were collected using a predesigned structured proforma. The questionnaire captured demographic details (age, gender), occupation, duration of employment, history of atopy, frequency of hand hygiene practices such as hand washing (HW) and alcohol-based sanitizers, type and duration of glove use, and exposure to disinfectants or other potential irritants. Clinical examination was performed to confirm the diagnosis of CD, and further classified as irritant or allergic based on clinical features and, where necessary, patch testing. The severity of dermatitis was graded using the Hand Eczema Severity Index [5].

Statistical analysis: Data were compiled and analyzed using appropriate statistical tools, with categorical variables expressed as percentages and continuous variables as means with standard deviations. Associations between variables were assessed using chi-square or t-tests, and P <0.05 were considered statistically significant.

Results

Among the 134 study members, the majority belonged to the 31–40 years (41%; 55), followed by 21–30 years (31.3%; 42). Participants aged 41–50 years constituted 19.4% (26), while those above 50 years were 8.2% (11). Female were predominate study population 64.2% (86). Nurses represented the largest group (36.6%; 49), followed by doctors (26.1%; 35). Housekeeping staff 21.6% (29), while laboratory technicians accounted for 15.7% (21). In this study 59 (44.0%) had CD, with irritant type being more common (71.2%) than allergic (28.8%). A history of atopy was noted in 20.9% of participants. Prolonged glove use exceeding 4 hours daily was reported by 57.5%, indicating significant occupational exposure.

Among the 59 HCWs with CD, hand involvement was most common (81.4%), followed by wrist and forearm (37.3%). Predominant symptoms included dryness and scaling (69.5%), itching (64.4%), and erythema (44.1%). Vesiculation was observed in 18.6%, indicating varying severity and clinical presentation of dermatitis. A significant association was found between CD and female gender (P = 0.048), glove use exceeding 4 hours/day (P = 0.016), history of atopy (P = 0.004), and HW > 10 times/day (P = 0.002), indicating these as key occupational risk factors (Table 1).

Table 1: Association of risk factors among the study members

Risk Factor	CD		P value
	Present	Absent	
Female	43 (72.9)	43 (57.3)	0.048
Glove use > 4 hours/day	41 (69.5)	36 (48)	0.016
History of atopy	19 (32.2)	9 (12)	0.004
>10 HW episodes/day	46 (78)	38 (50.7)	0.002

Discussion

This prospective study revealed a significant prevalence (44%) of CD among HCWs, with the majority affected falling within the 31–40-year age group and females comprising 64.2% of participants. The predominance of CD among females is consistent with existing literature, possibly due to higher exposure to irritants through frequent hand hygiene and PPE usage among nursing staff, who formed the largest occupational group in this study (36.6%) [3]. Nurses are particularly susceptible due to repeated exposure to handwashing, disinfectants, and gloves, which compromise the skin barrier and facilitate the development of ICD, the most common type in this cohort (71.2%).

Previous studies have similarly reported high prevalence of ICD among HCWs. A study by Lan et al. during the COVID-19 pandemic found that 74.5% of frontline workers reported skin damage, mostly affecting the hands and face, attributed to prolonged use of gloves and PPE [1]. Another Indian study identified that 49.3% of healthcare providers developed CD, with nurses being the most affected group, followed by housekeeping staff, which aligns with our findings [6]. The frequency of handwashing episodes (>10/day) and prolonged glove usage (>4 hours/day), as observed in 57.5% of our participants, were significantly associated with the occurrence of CD.

Furthermore, a notable 20.9% of study participants had a personal history of atopy, which was significantly associated with the development of CD (p = 0.004). Atopic individuals have a compromised epidermal barrier, making them more vulnerable to irritants and allergens. Ibler et al. reported similar findings, identifying atopy as a strong risk factor for

hand eczema in HCWs [7]. This underlines the importance of preventive strategies, such as using alcohol-based hand rubs, barrier creams, and hypoallergenic gloves, especially for atopic individuals. Overall, the study highlights the urgent need for dermatological surveillance and targeted interventions in healthcare settings to mitigate occupational skin diseases.

In this study, hand involvement was the most frequently observed site of CD among affected HCWs, seen in 81.4% of cases. This is expected, given the frequent and repetitive hand hygiene practices, including the use of alcohol-based sanitizers, soaps, and gloves. The high prevalence of symptoms such as dryness and scaling (69.5%), itching (64.4%), and erythema (44.1%) reflects the typical clinical spectrum of irritant CD, which arises from cumulative skin barrier disruption. Vesiculation, observed in 18.6% of cases, was less common and usually indicative of more severe or allergic variants of CD.

These findings align with previous research highlighting the hands as the primary site of occupational dermatitis among HCWs. Lin et al. reported that 74.5% of HCWs experienced adverse skin reactions, with hand involvement being predominant due to constant glove use and hand hygiene measures during the COVID-19 pandemic [4]. Similarly, a study by Singh et al. in Indian HCWs documented common presentations including itching, dryness, and redness predominantly affecting the hands [8]. These patterns underscore the need for preventive skin care protocols, such as barrier creams, appropriate moisturizers, and use of less allergenic gloves in healthcare settings.

This study identified several statistically significant risk factors associated with the development of CD among HCWs. Female gender was significantly associated with CD ($P = 0.048$), which is consistent with previous literature suggesting that women, particularly those in nursing roles, are at greater risk due to more frequent patient contact and hand hygiene practices. The higher prevalence among females could also be attributed to differences in skin physiology and hormonal influences that may make their skin more susceptible to irritants and allergens [9].

Prolonged glove use for more than 4 hours per day showed a significant association with CD ($P = 0.016$). Extended glove use leads to occlusion, excessive sweating, and maceration, thereby compromising skin barrier function and increasing susceptibility to both irritant and allergic reactions. This observation is supported by a study conducted by Lan et al., which reported that 88.5% of HCWs experienced glove-related skin damage during the COVID-19 pandemic, particularly with prolonged usage [1]. Additionally, frequent HW exceeding 10 times per day was significantly linked to CD ($P = 0.002$). Repeated washing removes the lipid layer of the skin, leading to dryness, fissures, and inflammation, especially when done without adequate moisturization.

A personal history of atopy also emerged as a strong risk factor for CD ($P = 0.004$). Individuals with an atopic background have an inherently weaker skin barrier and are more vulnerable to environmental irritants and allergens. It was found that HCWs with atopic dermatitis were twice as likely to develop hand eczema compared to non-atopic individuals [3, 10]. These findings highlight the multifactorial nature of CD in healthcare settings and underline the importance of adopting preventive strategies such as using hypoallergenic gloves, limiting glove usage duration, using alcohol-based hand rubs instead of soap and water when appropriate, and routine application of emollients. Regular screening for early signs of dermatitis, especially among high-risk groups, is essential for timely intervention and to ensure occupational well-being.

Conclusion

This study highlights a significant prevalence of CD among HCWs, with irritant CD being the predominant type. Female gender, frequent HW, prolonged glove use, and a history of atopy were identified as major risk factors. The hands were the most commonly affected site, with symptoms like dryness, itching, and erythema. These findings underscore the importance of preventive strategies such as the use of hypoallergenic gloves, moisturizers, and alcohol-based hand rubs. Institutional awareness and regular dermatological surveillance are essential to safeguard the skin health of healthcare workers and maintain their occupational efficiency and well-being.

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