

Skin reactions to COVID preventative measures – cleansing agents & PPE

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- COVID-19 & dermatitis from increased use of cleansing agents & hand sanitisers
 - Increases of occupational skin diseases due to cleansing agents What is in the literature?
 - Possible causative agents
 - Irritants detergents, surfactants, iodine
 - Allergens preservatives, fragrances, surfactants etc.
 - Poor hand care
- Skin reactions due to use of other protective measures
 - Gloves
 - Masks
 - Respirators



"A picture paints 1000 words"























Irritant Contact Dermatitis



Contact Urticaria



Allergic Contact Dermatitis







Location – Country /area	Population/ Study size	Skin damage reported	Prevalence
Hubei, China	542 hospital Physicians, nurses in tertiary hospitals	Hands	74,5%
Wuhan	376 Doctors & nurses in 5 University & 5 regional hospitals	Hands	84,6% among those who reported skin problems
Wuhan, China	330 HCW in clinics & in-patient wards	Skin barrier damage	71% overall
28 Provinces in China	4306 Medical staff in 161 hospitals	Moisture-associated skin damage (MASD)	10,8%
South Wales, UK	Observational case series from a district hospital in Wales (72 workers)	Irritant hand dermatitis Worsening of pre-exiting dermatological conditions	62,5% 23,6%
London and Manchester, UK	2 NHS Foundation Trust clinics in England (146; 85 workers)	Hand dermatitis	35,3% 48,3%



Hand dermatitis & hand cleansers

- Data from the Occupational Skin Clinic at NIOH
 - 699 patients (2006-2016) 327(46,9%) had hand dermatitis (HD)
- NIOH surveillance report for 2019
 - 28% of patients had hands as primary site of dermatitis
- COVID-19 pandemic Increased frequency of hand cleansing
 - Sanitising or hand-washing for HCW & general public
 - Likely to result in an increase in the prevalence of hand dermatitis
- May 2020 to March 2021
 - 37 patients seen at NIOH skin clinic 60% (22) presented with hand dermatitis
 - Anecdotal reporting from staff members (lab & other) of rash on hands

Skin Irritants

- Excessive use of water and soap (highly recommended protective measure against exposure to Covid-19 virus)
- Exaggerated hand washing with detergents/disinfectant
 - Penetration of foreign substances
 - Development of irritant and allergic contact dermatitis
 - Changes in the normal microbial flora in/on the skin
 - Supports the overgrowth of pathological organisms on the skin
- Even mild soaps containing alkyl sulphates (e.g. sodium lauryl sulphate) as major surfactants can be highly irritating
 - Lauryl glucoside and Cocamidopropyl betaine appear to be milder surfactants



Skin Irritants

- Surfactant residues in soap form a reservoir on the skin, even after rinsing with water
 - Small amounts are large enough to produce barrier impairment
- Use of hot water enhances the irritant effects by promoting greater absorption of the cleansers
- Other irritants include:
 - Chlorhexidine digluconate
 - Chloroxylenol [or para-chloro-meta-xylenol (PCMX)]
 - Triclosan (anti-microbial)
 - Alcohol based hand sanitisers



Allergens in hand cleansers

Common contact allergens are:

 Quaternary ammonium compounds [e.g. benzalkonium chloride, cetrimide - biocides often used as disinfectants in hospitals]



- Iodine or iodophors (preparation containing iodine complexed with a solubilizing agent)
- Chlorhexidine (chlorhexidine digluconate) [IgE mediated reactions]
- Triclosan
- Chloroxylenol
- Alcohols (rarely)





.....More allergens in hand cleansers

- Fragrances, surfactants and preservatives
 - Sodium benzoate
 - Cocamidopropyl betaine
 - Cocamide diethanolamine
 - Benzyl alcohol
 - Stearyl or isostearyl alcohol
 - Phenoxyethanol
 - Myristyl alcohol
 - Propylene glycol
 - Benzalkonium chloride
 - Methylchloroisothiazolinone/methylisothiazolinone
 - Methyldibromoglutaronitrile



Allergens identified by patch testing at NIOH OSD clinic

- Most common preservatives:
 - Methylisothiazolinone
 - MCI/MI mix (Kathon)
 - Methyldibromoglutaronitrile (MDBG)
- Fragrances
 - Mixes I & II
 - Balsam of Peru
 - Sesquiterpene lactone





MCI/MI Allergic patients











Other factors that aggravate the skin

- Certain hand hygiene practices can increase the risk of skin irritation and should be avoided
 - Washing hands with soap and water immediately before or after using an alcohol-based product
 - Unnecessary & it removes the natural sebum layer that protects the skin
 - Increases skin irritation and dryness
 - Reduces bactericidal efficacy of skin barrier

.....Still other factors which can aggravate skin irritation

- Donning gloves while hands are still wet from either washing or applying alcohol
- Wearing gloves for excessively long periods of time (Wuhan)
- Number of times & when hands are washed (5 instances during patient care; many other occasions)
- Lack of a good hand-care regime



Hand Hygiene Recommendations

- Although Alcohol-based hand antiseptics (ABHA) can cause dryness and skin irritation
 - Substantially reduce bacterial count on hands
 - Better tolerated than soap and water gentler on skin than frequent soap and water washes
 - Preferable for hand hygiene when hands are not visibly soiled
 - Require less time than handwashing
 - Are more accessible
 - Are self-drying
 - NB that hand sanitisers contain skin emollients (moisturisers)

https://www.safetyandquality.gov.au/our-work/infection-prevention-and-control/national-hand-hygiene-initiative-nhhi/what-hand-hygiene/alcohol-based-handrubs



- In addition to appropriate cleansing agents, NB that there is good hand-care
- Use of moisturising products essential to:
 - Restore the ability of the stratum corneum to absorb, retain and redistribute water
 - Help to maintain the integrity and appearance of the skin
 - Recommended for treating dry skin and mild dermatitis
- Important that moisturises are acceptable to users to ensure regular use
- Should be in tubes or dispensers (prevent contamination)

Hand-care at work and at home

- HCW should use water-based creams at work
 - Oil-based moisturises may have deleterious effects on the integrity of rubber gloves
 - Barrier creams (occlusive) not recommended for HCW
 - Efficacy of these products is equivocal
 - Efficacy of antiseptic agents used in the facility
 - May contain sensitisers
- At home:
 - Use of ointments (80% oil and 20%) [recommended for extremely dry skin and for treating mild dermatitis]
 - At night ointment can be applied under cotton or loose plastic gloves – helps to replenish barrier
- Repeated hand-sanitising at malls/shops
 - Ensure regular moisturising
 - If barrier is damaged possibly wear gloves



"Healthy Skin is a prerequisite for effective hand hygiene, since open wounds and damaged, cracked skin may impair thorough disinfection" Harness JC; et al



Importance of Personal Protective Equipment (PPE)

- COVID -19 focus on protecting oneself & others
- Protective measures include
 - Surgical & cloth masks (a barrier to splashes, droplets, and spit)
 - Goggles
 - Face shields (Adjunct PPE)
 - Respirators
 - Gloves
 - Gowns
 - Coveralls
- Provide protection **but** change the environment of the body \rightarrow adverse effects

Reactions to PPE

- Skin reactions include
 - Irritation
 - Allergic reactions
 - Acne



- Physical discomfort
 - Heat
 - Dehydration
 - Headaches
 - Dizziness



- Respiratory symptoms
 - Rhinitis
 - Asthma
 - Allergies (latex)



Pressure injuries



• Bridge of the

nose

- Forehead
- Behind ears



Location – Country /area	Population/ Study size	Skin damage reported	Prevalence
Hubei, China	542 hospital Physicians, nurses in tertiary hospitals	Lesions of nasal bridge; Cheeks Forehead	84,1% 78,7% 57,2% (97% overall)
Wuhan	376 Doctors & nurses in 5 University & 5 regional hospitals	Cheeks Nasal bridge	75,4% 71,8% (74,5% overall)
28 Provinces in China	4306 Medical staff in 161 hospitals	Device related pressure injuries (DRPI) Skin tear	30,0% 2,0% (Overall 42,8%)
Hubei Province, China	61 doctors & nurses	N95 damage: Nasal bridge Facial itching Skin damage Latex gloves: Itching Rash Chapped skin	68,9% 27,9% 26,2% 31,2 23% 21.3%
Singapore, Tau Tock Seng Hospital	322 HCW	N95 masks Gloves Gowns	35,5% regularly reported 21,4% 4,1%
South Wales, UK	Observational case series from a district hospital in Wales (72 workers)	Pressure related facial symptoms Worsening of pre-exiting dermatological conditions	4% 23,6%
London and Manchester, UK	2 NHS Foundation Trust clinics in England (146; 85 workers)	Facial dermatoses	46,3% 3,7%

Irritant reactions from wearing gloves



INCORRECT GLOVES







Reactions to glove material

Urticaria

Allergic contact dermatitis – Thiuram





Allergic contact dermatitis – Thiuram; IgE to latex



NATIONAL HEALTH

Reactions to latex gloves



Latex allergy – respiratory symptoms

- Asthma
- Anaphylaxis

Investigation of reactions:

- Multiple causation
- Thorough
 - Latex allergy
 - ACD not only rubber
 - Other e.g. fragrances,

preservatives

- Atopy
- Intervention measures
 - Change in gloves
 - Move to different area
 - Other exposures







Reactions to facial protection

Reactions to Respirators

- Long hours of wearing
- Very tight fit –(Fit test)
- Dressings?
 - Absorbent
 - Hydrocolloidal
 - Barrier film (not affect fit)
- Limit time of wearing
- Other masks when possible
- Use of emollients





Allergic reaction to respirator



Allergy to mercaptobenzothiazole – accelerator in rubber





NATIONAL HEALTH LABORATORY SERVICE





Prevention –

- Routinely cleaned & moisturised
- Emollients 1hr before using facial PPE
- Limit wearing time

Reactions to masks -Acne





Device related pressure ulcers

Skin care very NB to limit DRPU

- Using emollient e.g. petroleum jelly
 - Lubricant & protects skin from sweat
- Substitute goggles for face shield



COVID-19 and impact of personal protective equipment use: From occupational to generalized skin care need. <u>Laura Atzori</u> et al. <u>https://doi.org/10.1111/dth.13598</u>

"Skin barrier dysfunction and potential microbiota disorder of inflammatory facial dermatoses might make patients more vulnerable to mask side effect"

Realities





Considerations to prevent adverse reactions

- PPE should fit properly
 - Gloves too tight dexterity is limited; could tear during use; cause pressure & increased perspiration
 - Gloves too loose will do a poor job keeping out potential pathogens and could get caught in equipment
 - Respirators not properly fitted damage to skin &/or reduced protection
 - PPE must be appropriate for the exposures



.....More considerations to prevent adverse reactions

- Provide protection for required time (breakthrough time; permeation; degradation)
 - » Use of mixtures of chemicals
 - » Contaminants which may affect the integrity of the gloves
- NB to consider cost of OSD vs quality PPE
 - Treatment
 - Time off work
 - Job loss
 - Re-training





.....even more considerations to prevent adverse reactions

- Education and training material
 - Training on the proper use & care of all PPE
 & exposures in the workplace is essential
 - Awareness of early symptoms of skin problems
 - Good housekeeping, work practices, and self-care must be emphasised



assessment of the job	formation for the appropriate choice and use o must clearly demonstrate that exposure is una	I GLOVES to reduce the risk of exposure to infectious agents. The risk voidable and all other methods of control are not reasonably practical.	
OLOVES MUST BE	WORN BY:	INAPPROPRIATE & UNNECESSARY USE OF GLOVES	
Health workers (HWs) providing citizal work involving		The use of gloves when not indicated is a waste of	
direct care for patients		resources and does not reduce transmission	
Laboratory staff handling samples		HWs doing preliminary screening (e.g. completing	
Caregivers involved with providing direct care or when		questionnaires) where there is no direct contact with the	
handling stool, u	ine or waste from a COVID-19 patient	patient and social distancing can be maintained	
Cleaners in healthcare facilities, laboratories & care		Non-healthcare workers where contact precautions are not	
facilities		necessary	
	THERE ARE SEVERAL IN	PORTANT CONSIDERATIONS	
and Math	ALL WORKERS MUST BE TRANED ON THE CORRECT SELECTION, USE AND DISPOSAL OF OLOVES Containisated gloves can become a means for spreading germs from repeated louching of surfaces		
Dia 100			
KRUW :			
	Hand hygiene must be done before do	ming (putting on) gloves and after dofiing (taking off)	
Medical gloves are single-use items, therefore decontamination and reprocessing are not recommended			
Acres 1	this may affect the integrity of the glove	\$	
	 Gloves should be changed between page 	tients and between different treatment activities for the same patient,	
	(where relevant)		
 Double gloving is n 	ot recommended for routine care		
 Prolonged use or g 	oves for contact precautions without performin	a nand nyglene can result in the transmission of gems	
 Gloves must be ap 	indpriste for the purpose and most give the de-	a possible level of protection	
 It is important to ch 	eck the performance of the ployes on the job		
· Good hand-care sh	ould be practiced to limit damage to the skin h	wever of-based band jotions or creams may adversely affect the	
integrity of latex glo	ves		
 If gloves are contained. 	minated they should be disposed of in infe	tious waste according to the hazardous waste management	
	SELECTION	OF GLOVES	
Slove material	Advantages	Disadvantages	
latural latex rubber	 Highest comfort, flexibility, fit and tactile sens Protective against viruses & becterie 	 Allergic reaction to latex may occur in some individuals therefore low latex, powder-free gloves are recommended 	
	- Most puncture resistant material for disposal	is medical gloves	
Nirie	 Good protection egainst microorganisms and Chiorinated finish applied to the playe makes 	chemicals - Olightly lower desterily then natural rubber latex denning 5	
	doffing easier	- Easily tom	
	 Are suitable to wear for extended amount of device by and increased comfort into to be obtained. 	ime due to ned from supplieri	
PVC (Visyl)	- Optimal for tasks that have a minimal exposu	re to - Less durable	
	microorganisms, and require frequent glove in Lowest electry rate	- Less resistant to punctures	
teavy duty gloves lates/viny()	 Resistant to cleaning chemicals Can be disinfected according to SDE from as 	- If not disinfected properly can spread infection	
Gall (7) 1 h recommende	d thei gloves used should comply with the lowth Altican National	Nander& (MARI-11186), National Regulator for Computery Flandac& (MFCE) or other relevant	
Subscraptional distribution in the			

To end.....

Use of PPE can provide very necessary protection but it can also cause adverse health reactions & all possible measures need to be put in place to prevent damage which can occur





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