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Occupational skin conditions on the front line: a survey among 484 Chinese healthcare professionals caring for Covid-19 patients

Editor

The 2019-nCoV outbreak occurred in Wuhan, China in December 2019.¹ This unprecedented virus has caused global pandemic and over 2 300 000 cases worldwide in total number,² which has been bringing tremendous pressure and challenges to medical institutions and clinical staff around the world. 2019-nCoV can be transmitted by droplets primarily, while it has been reported that surface contact transmission exists as well.³ Keeping the integrity of skin barrier is a critical method to prevent the spread of 2019-nCoV, since skin is the first line of defence of human body.⁴ It is of prime importance to ensure and maintain the skin clean, sterilized and protected of clinical healthcare staff during the fight against the epidemic. Self-protection of the medical staff is essential, however, utilizing protective equipment such as goggles, masks and protective clothing continuously impairs skin integrity and the skin damage caused by the respective protective measures must be taken seriously.

To investigate the skin conditions of the front-line medical staff during the outbreak of 2019-nCoV, and identify any correlations between skin injury and the protection. We created an online questionnaire survey on skin problems in 484 clinical front-line medical staff in China during the period of 2019-nCoV and the results are as follows.

Among the 484 participants, half of them was from Wuhan and half was from the other 11 provinces of China. Female workers accounted for more than three quarters of the total (75.8%), the rest were males. The age distribution of the medical staff divided into four groups (Fig. 1a). The department of the medical staff was shown in Fig. 1b. The protection level of the participants was divided into three levels. 18.2%, 64.1% and 17.2% of participants were equipped with biosafety level 1, 2 or 3, respectively (Fig. 1c). More than half of the participants wore the protective suit between 4 and 6 h at a time and 9.1% of them kept the suit on for longer than 6 h (Fig. 1d). 64.2% of the staff

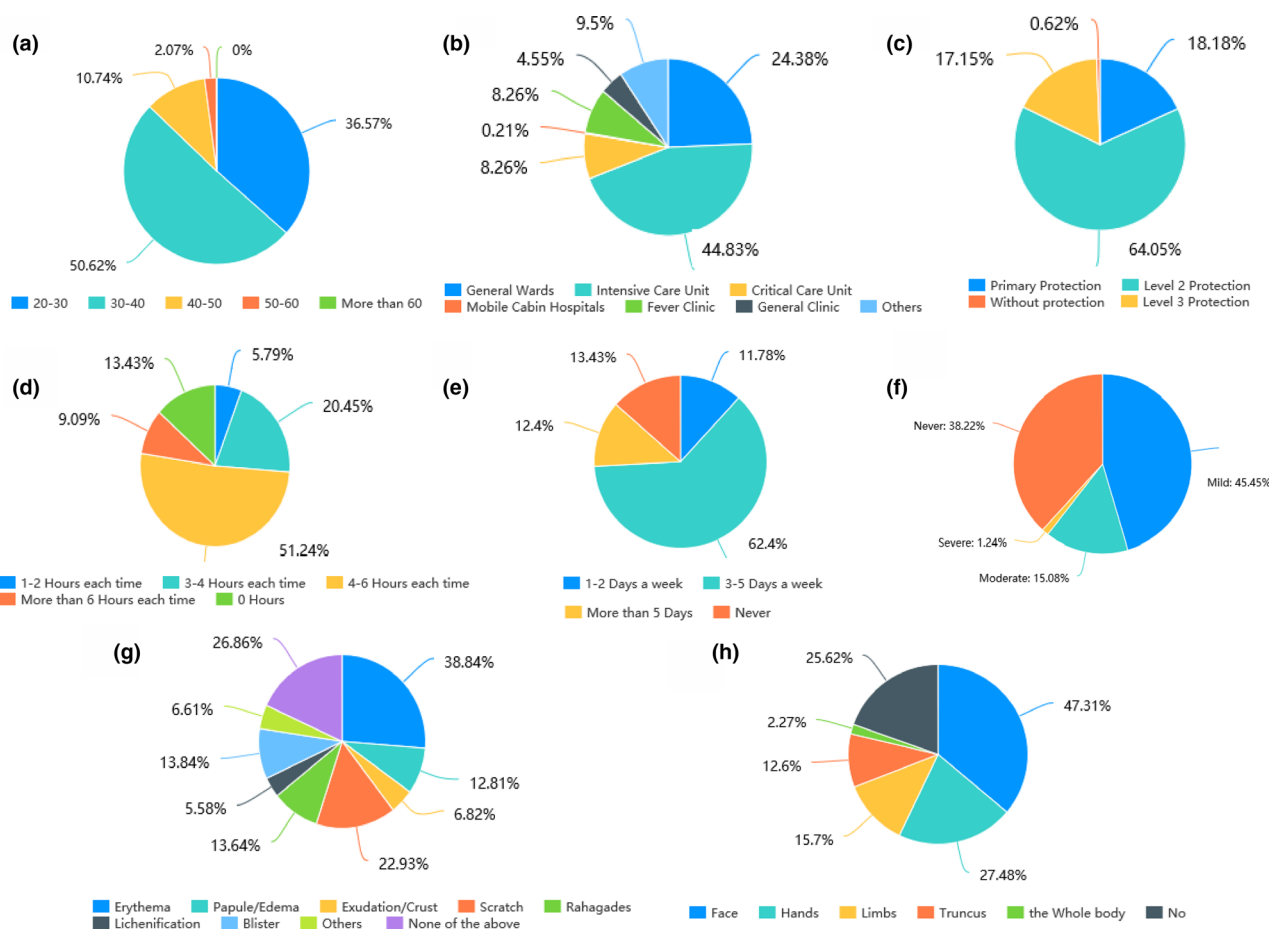


Figure 1 (a) Age distribution of the medical staff. Half of the staff were between 30 and 40 years old (50.6%), and followed by 20–30 years old (36.6%), 40–50 years old (10.7%) and 50–60 years old (2.1%). (b) Department of the medical staff. Nearly, half of the participants worked in the intensive care unit (44.8%), followed by general wards (24.4%), critical care unit and fever clinic (both 8.3%), general clinic (4.6%) and mobile cabin hospitals (0.2%). (c) Protection level of the participants. The proportion of the primary protection, level 2 protection and level 3 protection was 18.2%, 64.1% and 17.2%, respectively. (Biosafety level 1 protection included wearing overalls, disposable hats, disposable surgical masks, disposable isolation clothing and disposable gloves. Level 2 protected personnel wore overalls, disposable hats, medical protective masks such as N95, goggles or protective masks, and as outer cover a medical protective suit with disposable gloves. Finally, level 3 protection was defined as the same combination as in level 2 but with addition of face mask, or a medical mask, goggles or face mask to a full set or with electric air filter respirator). (d) Duration of using the protective suits. More than half of the participants wearing the protective suit between 4 and 6 h per time and 9.1% of them wearing the suit over 6 h. (e) Working frequency. 64.2% of the staff worked 3–5 days a week, 12.4% of the staff worked more than 5 days a week, and 11.8% worked 1–2 days a week. (f) Degree of itching. 61.8% of the participants had various degrees of pruritus. 45.5% has mild, non-irritating pruritus, 15.1% were irritated by moderate pruritus, which, however, did not affect them during off-duty time. 1.2%, however, had severe itching, which negatively affected sleep and impaired their overall well-being outside the hospital. (g) Type of the lesions. 73.1% of the participants suffered from different type of lesions. The lesions manifested as erythema (38.8%), scratch (22.9%), blister (13.8%), rahagades (13.6%), papule/oedema (12.8%), exudation/crust (6.8%) and lichenification (5.6%). (h) The distribution of the lesions. Nearly, half of the lesions performed on face (47.1%), followed by hands (27.5%), limbs (15.7%), truncus (12.6%) and the whole body (2.3%).

worked 3–5 days a week, 12.4% of the staff worked more than 5 days a week, and 11.8% worked 1–2 days a week (Fig. 1e). To determine the degree of itching, we let participants grade their symptom into three intensity levels. 61.8% of the participants have various degrees of pruritus, the proportion is 45.5% (mild), 15.1% (moderate) and 1.2% (severe; Fig. 1f, degree of itching is

demonstrated in legend). Among the 484 participants, 73.1% suffered from various skin lesions. The lesions manifested as erythema (38.8%), prurigo (22.9%), blisters (13.8%), rahagades (13.6%), papule/oedema (12.8%), exudation/crust (6.8%) and lichenification (5.6%) (Fig. 1g). The distribution of the lesions was wide. Nearly, half of the lesions were located on the face

Table 1 (A) The correlation between the protection level and the degree of itching, site of the lesions and the type of the lesions, (B) The correlation between the working frequency and the degree of itching, site of the lesions and the type of the lesions. (C) The correlation between the duration of wearing protection suit and the degree of itching, site of the lesions and the type of the lesions

| (A) | | | | |
|--------------------------------|-----------|-----------------------|----------------------|---------|
| Characteristics | Total | The protection level | | P value |
| | | Primary protection | Level 2&3 protection | |
| Itching or not | | | | |
| Mild, moderate & severe n, (%) | 297 (100) | 44 (14.8) | 253 (85.2) | 0.0121 |
| Never | 184 (100) | 44 (23.9) | 140 (76.1) | |
| Site of the lesions | | | | |
| Face, n, (%) | 229 (100) | 28 (12.2) | 201 (87.8) | 0.0016 |
| Hands, n, (%) | 131 (100) | 20 (15.3) | 111 (84.7) | 0.3584 |
| Type of the lesions | | | | |
| Erythema, n, (%) | 187 (100) | 21 (11.2) | 166 (88.8) | 0.0021 |
| Papule/oedema, n, (%) | 62 (100) | 8 (12.9) | 54 (87.1) | 0.3170 |
| Exudation/crust, n, (%) | 33 (100) | 3 (9.1) | 30 (90.9) | 0.2365 |
| Scratch, n, (%) | 111 (100) | 13 (11.7) | 98 (88.3) | 0.0567 |
| Rahagades, n, (%) | 65 (100) | 8 (12.3) | 57 (87.7) | 0.2420 |
| Lichenification, n, (%) | 27 (100) | 8 (29.6) | 19 (70.4) | 0.1896 |
| Blister, n, (%) | 67 (100) | 11 (16.4) | 56 (83.6) | 0.7963 |
| (B) | | | | |
| Characteristics | Total | The working frequency | | P value |
| | | 0–2 days | More than 3 days | |
| Itching or not | | | | |
| Mild, moderate & severe n, (%) | 299 (100) | 63 (21.1) | 236 (78.9) | 0.0899 |
| Never | 150 (100) | 24 (16) | 126 (84) | |
| Site of the lesions | | | | |
| Face, n, (%) | 229 (100) | 37 (14.8) | 192 (85.2) | <0.001 |
| Hands, n, (%) | 133 (100) | 30 (22.6) | 103 (77.4) | 0.4781 |
| Type of the lesions | | | | |
| Erythema, n, (%) | 188 (100) | 27 (14.4) | 161 (85.6) | <0.001 |
| Papule/oedema, n, (%) | 62 (100) | 9 (14.5) | 53 (85.5) | 0.0549 |
| Exudation/crust, n, (%) | 33 (100) | 3 (9.1) | 30 (90.9) | 0.0454 |
| Scratch, n, (%) | 111 (100) | 17 (15.3) | 94 (84.7) | 0.0091 |
| Rahagades, n, (%) | 66 (100) | 17 (25.8) | 49 (74.2) | 1 |

Table 1 Continued

| (B) | | | | |
|---------------------------------|-----------|---|------------------|---------|
| Characteristics | Total | The working frequency | | P value |
| | | 0–2 days | More than 3 days | |
| Lichenification, n, (%) | 27 (100) | 8 (29.6) | 19 (70.4) | 0.7515 |
| Blister, n, (%) | 67 (100) | 15 (22.4) | 52 (77.6) | 0.6738 |
| (C) | | | | |
| Characteristics | Total | The duration of wearing protection suit | | P value |
| | | 0–4 h | More than 4 h | |
| Itching or not | | | | |
| Mild, moderate & severe, n, (%) | 299 (100) | 111 (37.1) | 188 (62.9) | 0.6474 |
| Never | 185 (100) | 81 (43.8) | 104 (56.2) | |
| Site of the lesions | | | | |
| Face, n, (%) | 229 (100) | 72 (31.4) | 157 (68.6) | 0.0006 |
| Hands, n, (%) | 133 (100) | 50 (37.6) | 83 (62.4) | 0.6380 |
| Type of the lesions | | | | |
| Erythema, n, (%) | 188 (100) | 54 (28.7) | 134 (71.3) | 0.0001 |
| Papule/oedema, n, (%) | 62 (100) | 22 (35.5) | 40 (64.5) | 0.5603 |
| Exudation/crust, n, (%) | 33 (100) | 8 (24.2) | 25 (75.8) | 0.0906 |
| Scratch, n, (%) | 111 (100) | 33 (29.7) | 78 (70.3) | 0.0199 |
| Rahagades, n, (%) | 66 (100) | 27 (40.9) | 39 (59.1) | 0.9313 |
| Lichenification, n, (%) | 27 (100) | 13 (48.1) | 14 (51.2) | 0.4688 |
| Blister, n, (%) | 67 (100) | 22 (32.8) | 45 (67.2) | 0.2725 |

(47.1%), followed by the hands (27.5%), limbs (15.7%), truncus (12.6%) and the whole body (2.3%) (Fig. 1h).

Our correlation analysis showed that medical staff with level 2&3 protection were more likely to experience itching than those using primary protection ($P = 0.0121$). More advanced protection ($P = 0.0016$), higher working frequency ($P < 0.001$) and longer wearing times of protective suits ($P = 0.0016$) were more correlated with the appearance of facial skin lesions ($P = 0.0006$). The occurrence of erythema is related to protection level ($P = 0.0021$), working frequency ($P < 0.001$) and the duration of wearing protective suit ($P = 0.0006$; Table 1).

Based on the above findings, the occurrence of skin lesions of front-line medical staff is closely related to the level of

protection, working frequency and duration of wearing protective suits. Therefore, to avoid decimation of the active workforce due to irritated skin, we recommend the implementation of effective measures to ensure the integrity of skin barrier of the front-line medical staff, what is more the dermatologist's intervention is necessary.

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SARS-CoV-2 infection in a psoriatic patient treated with IL-17 inhibitor

Editor

We read with great interest the article entitled 'SARS-CoV-2 infection in a psoriatic patient treated with IL-23 inhibitor' published by Messina F. and Piaserico S. in the JEADV.¹ This is the first report of coronavirus disease 2019 (COVID-19) in a psoriatic patient treated with a biologic.

Whilst the authors reported an infection that occurred during therapy with an IL-23 inhibitor, we would like to briefly report one that occurred during therapy with an IL-17 inhibitor.

The case here reported is peculiar for two reasons: (i) the patient was infected during the induction regimen; (ii) he was completely asymptomatic. He was a 55-year-old general

practitioner, with a 4-year history of psoriasis, previously treated with conventional drugs and the biological drug adalimumab.

On January 20, due to a worsening of the psoriasis, he was switched to ixekizumab and started the currently approved induction dosing regimen (160 mg at week 0, followed by 80 mg at weeks 2, 4, 6, 8, 10 and 12).

On March 3, following contact with a COVID positive patient, even though he was completely asymptomatic, he was tested for SARS-CoV-2, and resulted positive.

Although we advise all biological-treated patients to report any alteration in their health status, he did not inform us and decided to continue biological therapy as formerly prescribed.

Since our Psoriasis Outpatient Service suspended all follow-up visits, in accordance with the directives of the Regional Health Service, we contacted all scheduled patients by phone. We were informed of his history only when we called him on April 2 after his second test had already resulted negative (i.e. the patient could be considered healed). He confirmed never having suffered from cough, dyspnoea, anosmia, ageusia, myalgia or any other symptom of the infection.

There are some evidences that IL-17 is implicated in acute respiratory distress syndrome, which is the major life-threatening complication of COVID-19,² as well as observations that an aberrant Th17 polarization may correlate with a worse outcome in coronavirus-related pneumonia.³

Since the inhibition of IL-17 pathway may have beneficial effects in treating COVID-19,⁴ ixekizumab associated with antiviral drugs is being investigated for the treatment of COVID-19 infection.¹

However, all the previous observations and studies concern cases characterized by progression of the disease towards an abnormal and exaggerated inflammatory response, similar to cytokine release syndrome, that can be considered a secondary phase of the SARS-COV-2 infection.

On the contrary, the case here reported seems to suggest that blockade of IL-17 does not negatively affect the primary phase of infection that is the virus binding to human cells and its replication, since our patient was on continuous medication with ixekizumab and furthermore was following the induction regimen, taking the drug every other week.

In conclusion, our observation strengthens the hypothesis that IL-23/IL-17 axis inhibition might not be detrimental in the setting of COVID-19 infection, even though it remains of utmost importance to collect more evidences and to gather as many cases as possible related to psoriasis patients in biological therapy who have contracted COVID-19, in order to better quantify the risk of infection under biologic therapy.⁵

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