

# Face Masks Induced Contact Dermatitis Amongst Medical Personnel at the Clinic of Emergency Medicine and Patient Admission "Gaiļezers" in Riga, Latvia during the COVID-19 Pandemic

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**Abstract:** Personal protective equipment including face masks, is essential for the safety of health care workers. At the beginning of the COVID-19 pandemic and with the declaration of state quarantine, the medical staff of the Clinic of Emergency Medicine and Patient Admission "Gaiļezers" in Latvia were required to use personal protective equipment, including the use of a respirator.

**Objectives:** The aim of the study is to find out whether the use of respirators affects the condition of the facial skin and causes contact dermatitis to medical staff.

**Materials and Methods:** An anonymous questionnaire was used, which included 20 questions, and 53 medical professionals of the Clinic of Emergency Medicine and Patient Admission "Gaiļezers" (women (n=37), men (n=16) ) were surveyed. In the prospective part of the research - during the month of January 2021 (5.01.-31.01.2021.) one research participant filled out the questionnaire with four questions after each 24-hour shift in the hospital.

**Results:** In the study of 53 participants, in 72% of the cases respirators caused changes in facial skin condition. The most common region that was affected was the perioral area. The most common changes caused by respirator use were redness of the skin - 66.2% and itch of the face and neck skin - 56%. 76.9% of the surveyed medical staff observed itch and 33.3% of the participants assessed the itch as moderately intense. 50% of the respondents reported that changes were observed using an FFP3 respirator.

**Conclusion:** The use of a respirator can cause contact dermatitis to medical professionals after long-term use, which manifests as itchy skin of face and neck, redness of the skin and xerosis in most cases.

**Keywords:** Occupational dermatitis, face masks, COVID-19 pandemic, medical workers.

## INTRODUCTION

Personal protective equipment is essential to medical workers in every hospital, especially due to the SARS-CoV-19 pandemic. Prolonged personal protective equipment use has been shown to increase the risk of occupational dermatoses. Occupational dermatitis includes both - irritant contact dermatitis and allergic contact dermatitis [1]. The incidence of allergies caused by mask contact may increase. Allergic contact dermatitis is a delayed-type IV hypersensitivity reaction. Irritant contact dermatitis is the most common form of occupational skin disease, resulting from cytotoxic injury due to direct contact with chemicals or physical irritants [2].

Meanwhile, all medical staff needs to wear medical masks much longer during the pandemic than the general population, which may easily lead to local impressions, redness, erosion, eczema or other

manifestations [3]. In our study, we wanted to find out whether the use of respirators affects the condition of facial skin and causes contact dermatitis to medical staff of Clinic of Emergency Medicine and Patient Admission "Gaiļezers" in Latvia.

## MATERIALS AND METHODS

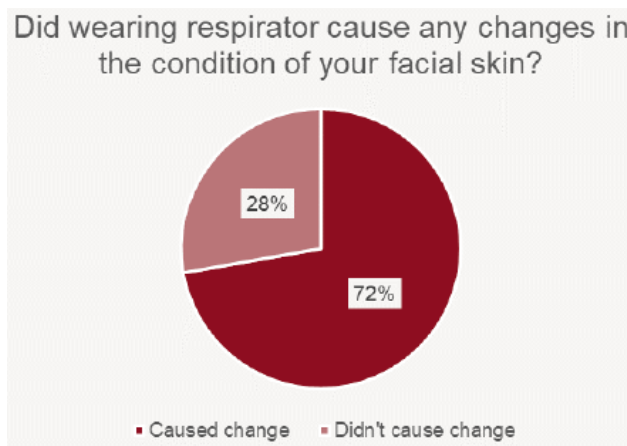
An anonymous questionnaire was designed, which included 20 questions, and 53 medical professionals of the Clinic "Gaiļezers" (women (n=37), men (n=16)) were surveyed. Research was done according to ethical principles, subject to informed consent of participants, voluntary participation, as well as ensuring the protection and confidentiality of individuals' physical data.

Analysis of data was done by using SPSS (Statistical Package for Social Sciences). Fisher's Exact Test was used to determine statistically significant associations between the respondent's age and gender, and face mask induced skin changes. For the analysis, the significance level was set at p-value less than 0.05, with a confidence interval of 95%.

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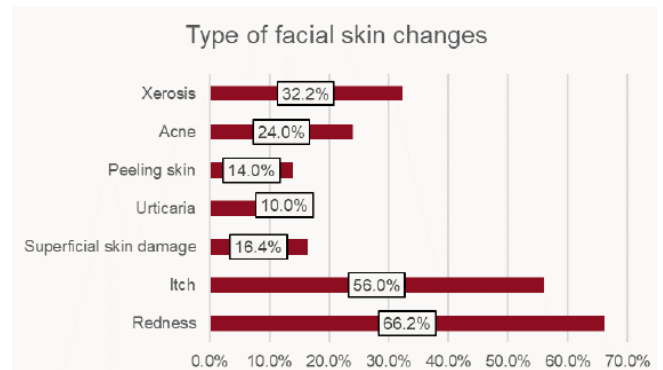
**RESULTS**

Anonymous questionnaires were sent to 72 medical professionals of the Clinic “Gaiļezers”, but 53 questionnaires were recovered, corresponding to a response rate of 77.7%. Three of the returned questionnaires were excluded due to incomplete filling. Participants of the survey were divided into age groups from 20 to 54. 50% of the participants were in the age group of 20-28 years, but only 1.9 % were in the age group of 46-54. Results show that in the study of 54 participants, in 72% of the cases respirators caused changes in facial skin condition (Chart 1). It's important to note that 68.5% of respondents hadn't had any skin diseases before. 46.9 % of respondents who had skin diseases before, were diagnosed with acne.

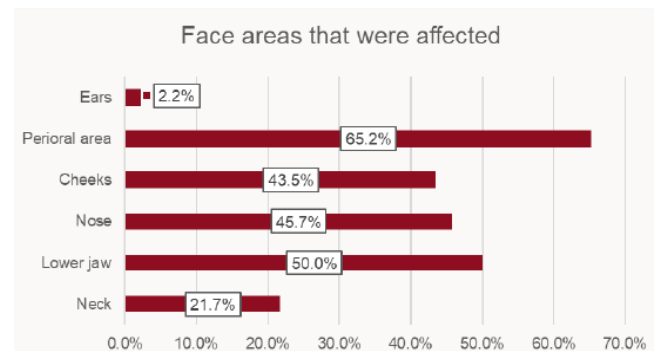


**Chart 1:** Changes in facial skin condition.

62.7% of respondents changes in the condition of facial skin observed immediately after respirator use. 57.4% of medical staff were wearing a face mask for 22-24 hours in one shift and 29.6% - 15-21 hours in one shift. Almost all respondents (94.2%) didn't have to visit a doctor or cosmetologist due to facial skin changes, but 38.5% of respondents used drugs or applied different skin care products. The most common changes caused by respirator use were redness of the skin – 66.2%, itching of the face and neck skin – 56% of respondents, xerosis – 32.2%, and acne – 24.0% of respondents (Chart 2). 76.9 % of medical staff observed and noted itch, which intensity was assessed as moderate by 33.3% of the participants. The itching was rated on a scale of 1 to 5, respectively 1 - very minimal itching, 5 - very intense itching. 25.6% of medical staff assessed itch as very intense itching. Areas the most affected by contact dermatitis were the perioral area - 65.2% of respondents, the lower jaw - 50% of respondents and the nose - 45.7% of respondents.



**Chart 2:** Types of facial skin changes.



**Chart 3:** Face areas that were affected.

No statistically significant associations observed between the respondent's age and face mask induced skin changes ( $p > 0.05$ ). Changes in facial skin were observed in 78.4% of women and 56.3% of men, but no statistically significant associations between gender and face mask-induced changes in facial skin was observed ( $p > 0.05$ ).

**DISCUSSION**

In this clinical case, we described irritant contact dermatitis. Clinical features of contact dermatitis in the acute phase include pruritus, erythema, dryness, and scaling, but vesicles and bullae can develop too. With chronic disease, lichenification and fissuring can occur. Adverse effects of using a respirator can develop with various mechanisms. One of them is due to respirator creating a hot and humid microclimate in regions of face that are covered by it which further predisposes flare-ups of acne. Moreover close-fitting respirator creates local pressure, that can affect sebaceous ducts and consequently acne develops [4]. Patch tests are the gold standard for diagnosing allergic contact dermatitis. Irritant contact dermatitis is usually a diagnosis of exclusion when Patch tests for allergic contact dermatitis are negative. Irritant contact dermatitis usually manifests as itch or rash [4]. We

didn't use Patch tests for this clinical case, but it would be a good addition for further research. It is important to note that the reported skin reactions could not be verified and documented by dermatologist, but were based on the subjective assessment of the healthcare staff themselves.

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