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Research Article

Possible Side Effects of using Detergents during the Covid19 Pandemic in Syria

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Abstract

Introduction: COVID-19 caused by SARS-CoV-2 very shortly turned into a global pandemic infecting more than 2 million people. The symptoms of this disease are acute respiratory illness, hyperthermia, cough, sore throat, breathlessness and diarrhea. In the absence of specific treatment, preventive measures (physical distancing, cleansing, personal hygiene) can only reduce the spread of this disease. However, over use and wrong mixing of these disinfectants and detergents for cleansing can cause several side effects on skin, respiratory system and eyes. The present study aimed to evaluate the use of detergents and disinfectants among a sample of Syrian community to locate the side effects arising due to the chronic and intensive exposure to them.

Methods: A questionnaire is prepared for the survey followed by recommendations to overcome the side effects.

Results: The questionnaire's results indicate Sodium hypochlorite as the major disinfectant (75.6%) while hand-cleansing agent was mainly (93.3%) soap. The most common side effects of these disinfectants were Xeroderma (26.77%), Erythroderma/itchy skin (14.8%) and irritation in the nasal mucous membranes (13.81%). Treatment for these side effects were moisturizing creams (53.54%) while the respiratory patients were cured in a well-ventilated rooms with the regular use of surgical masks (26.80%), medicines (9.03%) and no treatments (18.84%).

Conclusions: The study is unique for three reasons: First among its kinds to be conducted in the Syrian society. Second, it compares the advantages and disadvantages in using disinfectants. Third, it provides scope to other countries to experiment in the appropriate usage of disinfectants.

Keywords: Questionnaire; Disinfectants for COVID-19; Side effects; Xeroderma/Erythroderma

Introduction

COVID-19 is an infectious disease caused by the SARS virus CoV-2, which was first identified in Wuhan, China in December 2019, eventually spreading worldwide. This virus led to a new pandemic, which infected around five million people and led more than 300,000 deaths around the world.

The United States of America was the worstly affected country in the world (more than 1.5 million patients), followed by Brazil (more than 350,000 patients), and Russia ranking the third in the world in the number of COVID-19 victims (more than 340,000 patients). The COVID-19 mortality was recorded the highest in United States (about 100,000 deaths), followed by United Kingdom (more than 35,000 deaths), and Italy (more than 32,000 deaths) [1-3]. There has been a regular rise in the number of victims and deceased which have completely overthrown the health systems around the world, leaving no clues about the end of this global pandemic [4]. Additionally, this pandemic has caused a negative impact on many aspects of life, which in turn has an adverse effect on the global economy [5].

Common symptoms of Covid-19 include acute respiratory illness (cold-like disease), hyperthermia (fever>38 °C), coughing, sore throat, and shortness of breath. Also, numerous sufferers may also experience digestive symptoms such as anorexia, diarrhea, and vomiting [6-11]. Likewise, the disease may have an effect on the kidneys, as cases of acute renal insufficiency have been reported for some patients with Covid-19. In Wuhan, China, this insufficiency was recorded in 29% of the patients, leading to several deaths. This renal insufficiency could be due to the potential of the virus to cause significant conformational deviations in the properties of the renal tubules [12-18].

This rapid spread of the epidemic, led people to adopt a number of preventive measures around the world [19]. Among which, maintaining hygiene and cleaning hands and other surfaces are the most predominant ones [20]. Various disinfectants have been suggested and used around the world, such as sodium hypochlorite, ethanol, and soap. However, at numerous times these disinfectants have been inappropriately used resulting into both minor and dangerous life-threatening side effects [21]. The present study, through a series of questionnaires, aimed to evaluate the use of detergents and disinfectants among a sample of Syrian community and to shed light on the most common side effects that arise due to the chronic and intensive exposure to them.

Methods

A questionnaire (Table 1) was designed and electronically spread among 3024 participants in the Syrian community through email and different social media between 3rd and 10th April 2020. The questionnaire includes the following sections: Participant's age

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{3204 participants were categorized in 6 groups as per their adopted age ranges (15-24, 25-34, 35-44, 45-55, 55-64 and >65 years)} and provinces (Damascus, Rif Dimashq, Hama, Aleppo, Lattakia, Tartous, Homs, Idlib, As-Suwayda, Daraa Governorat, Al Hasakah, Deir Ez-Zor Governorate, Al-Raqqa, Quneitra Governorate), the disinfectants and detergents used by participants to clean the surfaces and hands (more than 1 option was allowed to choose on a presumption that most of the people used more than 1 disinfectants for ~~house~~ cleaning house), the side effects experienced by the participants, the intensity of those side effects, the different types of side effects the participants suffered from (more than 1 option was allowed to choose on an assumption that most of the participants have more than 1 symptoms), the applied strategies to circumvent those side effects, and the advantages availed on implementing those strategies.

Results

Categorization of participants as per their age

The participants were in the age group of 25-34 years (1,191; 37.2%) while the >65 years (18; 0.60%) witnessed to be the minimal. The rest of the participants were between the age range of 15-24, 35-44, 45-54 and 55-64 years with their numbers recognized as 1086 (33.9%), 589 (18.4%), 223 (7%) and 97 (3%) respectively (Figure 1A).

Distribution of participants according to the provinces

The participants of the two provinces of Damascus and the Damascene countryside were observed maximally of 39.7% (1,272) while the eastern region's participants (AL-Raqqa, AL-Hasakah, Deir ez-Zur) were minimal of 1.4% (61) of the total participants. The coastal region provinces of Lattakia and Tartous, were observed with 25.5% (817) participants followed by central region (Homs and Hama) 22.4% (718), the northern region (Aleppo and Idlib) 6.1% (196) and the southern region (Daraa, Suwayda, Quneitra) 4.4% (133) (Figure 1B).

Disinfectants used by the participants

The participants were interrogated about the disinfectants they use for cleaning the surfaces as preventive measures against the COVID -19 pandemic. Most of the participants (75.6%, 2,423) reported to use Sodium hypochlorite maximally followed by Ethanol 38.3% (1,226), soap 32.9% (1,054) and 19.2% (614). However, Dettol's effectiveness had not been proven yet. The rest of the participants were reported to use other disinfectants categorized under 'others' (16.40%) (Figure 1C).

Disinfectants used for hands cleaning

Soap and water were observed as the easiest and affordable hand disinfecting agent accounting to 93.3% (2,991) of the total participants, followed by Ethanol that were used by 52.2% (1,683) participants, cleansing hand gels 27.5% (880) and other cleansing solutions (cleansing sprays, usually consists of a combination of alcohols and other effective substances) 13.5% (433). It was also observed that due to their availability in pharmacy stores both Ethanol and cleansing hand gels could be used if soap and water were not available (Figure 1D).

Disinfectant's side effects

The participants were questioned about the side effects due to the repeated use of the indicated disinfectants. The data indicated that only a small part i.e., 39.6% (1,269) of the total participants did not suffer from any side effects while the major part i.e., 60.4% (1,935) suffered due to the recurring use of these disinfectants (Figure 1E). Further, a major population of 66.1% (1,279) of the total participants experienced side effects in mild intensity. Notably, 1.6% (31) underwent acute side effects with medical treatments. Additionally, around 27.1% and 5.1% of the total participants suffered from moderate and severe side effects respectively (Figure 1E).

Type of side effects

Majorly, 26.77% (518) of the participants suffered from Xeroderma (hands skin disease) followed by Erythroderma/itchy skin (14.8%) and irritation in the nasal mucous membranes (13.81%). Some of the participants also reported to suffer from irritation, pain or discomfort in the throat (11.5%), ocular symptoms such as irritation, itching, and lacrimation (5.1%), coughing (9.85%), shortness of breath (6.74%), bronchospasm (4.12%), sever skin allergy/rash (3.9%), wheezing (1.61%) and other side effects (1.8%) (Figure 1F).

Treatment of side effects

Participants suffered from skin symptoms reported to use moisturizing creams (53.54%) while the respiratory patients could get cured in a well ventilated rooms with the regular use of surgical masks (26.80%) and medicines (9.03%). Notably, a major part (18.84%) of the participants did not implement any treatments (Figure 1G). Furthermore, when interrogated whether the participants were benefited from those treatments, a majority (36.80%) observed to be profitable in comparison to a minor population who were not benefited (12.40%) (Figure 1G).

Discussion

The present study prepared a suite of questionnaires that shed light on the possible risk factors, which could be generated from the repeated use of disinfectants and detergents as preventive measures against unusual Coronavirus COVID-19 pandemic among Syrian population. It also evaluated the quality of the detergents and antiseptics', surveyed the intensity of these effects, how the Syrians dealt and circumvent them. At the end, it provided a set of valuable recommendations for the society and health departments.

It has been noticed from the questionnaire's results that the most common side effects, are skin roughness, Xeroderma**,** and Erythroderma**.** These skin disorders could be healed by using moisturizing creams, such as the creams that contain Aloe vera and lanolin extracts, or contain materials that help skin restoration and maintaining its safety such as panthenol and vitamin E [22,23]. As for the itching and Erythroderma, ointments that contain a blood vessel constrictor such as zinc oxide can be used [24,25]. Despite its effectiveness in managing symptoms of skin irritation and itching, the long-term usage of pharmaceutical products containing corticosteroids, harm the skin and cause vascular fragility. Therefore, it is not recommended for treatment. Moreover, this cure is also suggested for children [26, 27]. On the other hand, the ocular problems could be solved by using artificial tears drops {(eye drops that contain Poly Ethylene Glycol (PEG)} several times a day, or by using eye drops that contain topical anesthetics and anti-inflammatory materials if needed (prescription is required) [28,29]. The nasal and respiratory symptoms include coughing, and nasal irritation. Thereby, wearing a facemask is essential with the application of antiseptics or sterilizing substances. It is also crucial to provide an adequate ventilation in the rooms where the antiseptics are applied and used. However, if the symptoms are severe and intolerable, it is highly recommended to use cough suppressants, pain killers, and allergy medicines (such as antihistamines) with a prescription provided by a medical professional.

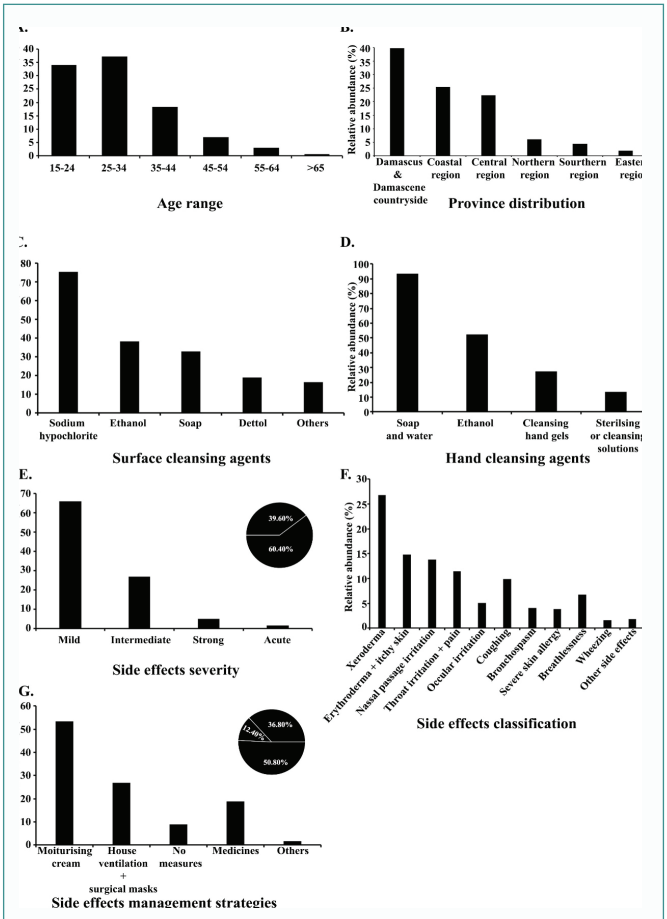

Figure 1: Relative abundances (A) Age categorization (B) Province distribution (C) surface and (D) hand cleansing agents (E) Side effects severity, (F) type of side effects and (G) their management strategies.

Additionally, it is advisable to drink hot drinks and eat throat softeners such as honey, sucking tablets, and tablets that contain lidocaine (a topical anesthetic), to get relief from throat irritation and pain. As for acute respiratory symptoms such as shortness of breath and wheezing, medical intervention and utilization of antiseptics and detergents should be stopped immediately.

As for the materials used to cleanse the hands, it is advisable to reduce the use of ethanol sprays, and replace them with antiseptic gels that contain ethanol, hands moisturizers such as glycerin, which reduces irritation and skin damage. It is also advisable to use soap and water (for twenty seconds) and use disinfectants only in some cases (such as going out of the house - at work -contacting with people).

It is also important to be sure to properly dilute the sodium hypochlorite solution in order to ensure its effectiveness on the one hand (as the concentrated solution does not have a strong cleansing efficacy), and on the other hand, to avoid side effects that may be dangerous to some. Additionally, it is compulsory to wear gloves and ventilate the house well while using it, and to wear a mask for people who have respiratory or allergy problems.

Conclusion

The present study with the help of a set of questionnaires, embarked on the usage of the disinfectants and their side effects on sample Syrian communities. However, in future these studies need to be extensive and exhaustive on other populations as well, especially

Table 1: Questionnaires set distributed between all the participants.

Numbers	Questions	Multiple choice answers
Q1.	What are the substances those you use to sanitize surfaces and floors during the COVID-19 pandemic (coronavirus)?	• Javel water (sodium hypochlorite) • Soap • Alcohol • Dettol • Other
Q2.	What material do you use to clean and disinfect your hands?	• Alcohol • Water and soap • Hand sanitizer (gel) • Disinfectant solutions (sprays or pumps)
Q3.	Did you suffer from any side effect caused by the continuous use of detergents and disinfectants?	• Yes • No
Q4.	What could be the degree of severity of these side effects?	• Minor • Moderately irritating • Severely irritating • Very severe that I had to receive medical intervention from (a doctor or a pharmacist or a hospital) • I did not suffer from any side effects
Q5.	What are the side effects, if you had suffered from any (means)?	• Itching and skin redness • Skin roughness (with or without itching and redness) • Nasal Irritation • Throat irritation • Eye allergy with redness or tearing • Coughing • Bronchospasm • Severe skin allergy or other skin symptoms (developed eczema – mild skin bleeding – rash) • Other symptoms • I did not suffer from any symptoms Wheezing • Breathing difficulties
Q6.	What did you do to manage and treat those symptoms?	• I used moisturizing creams for dermal symptoms • House ventilation in case of thoracic allergy and coughing with/or without using a facemask • I used antihistamines or painkillers or cough depressants • I did not use anything • I used other methods • I did not suffer from any symptoms that is why I do not use anything
Q7.	Have you benefited from managing and treating the side effects caused by the use of detergents and disinfectants? (Ignore, if you have not suffered from any side effects or did not use any method to ease the side effects)?	• Yes • No • (Ignore, if you have not suffered from any side effects or did not use any method to ease the side effects)

during the COVID-19 pandemic period. This will not only help to have a robust comparison between advantages and disadvantages of detergents and disinfectants available in markets, but can also help the health sectors to develop new set of recommendations for proper and balanced use of antiseptics to prevent both COVID-19 infections and their confrontational side effects.

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