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Original

New precipitating factors for migraine during Covid-19 pandemic lockdown

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Abstract

Background

Lockdown caused sudden lifestyle changes and represented a massive impact on human health. We aimed to report new migraine headache precipitating factors due to lifestyle changes during coronavirus disease 2019 (Covid-19) pandemic lockdown.

Methods

This cross-sectional survey included patients diagnosed with migraine based on The International Classification of Headache Disorders, 3rd edition (ICDH-3). During the lockdown, we submitted an online self-reported web-based questionnaire to patients already diagnosed with migraine and attending headache clinic at Ibn Sian Hospital in Kuwait. Questions explored different new precipitating factors of migraine headache attacks during Covid-19 pandemic lockdown compared to precipitating factors before lockdown.

Results

A total of 340 migraine patients responded to online questionnaire. The mean age of them is 34.65 years. Females were predominant (79.1%). Majority of the cohort (85%) has more than one trigger of migraine headache attack. During pandemic, the common precipitating factors were smell of strong odors in 214 (62.9%), followed by certain food in 175 (51.8%), sleep disturbance in 120 (35.3%), emotional or mental stress in 80 (23.6%), caffeine in 80 (23.6%), flickers of light in 78 (22.9%), weather changes in 68 (20%), smoking in 65 (19.1%), noise in 56 (16.5%), sun light exposure in 41 (12.1%), fasting/hypoglycemia in 40 (11.7%), hormonal changes in 37 (10.6%), physical excre- tion/fatigue in 24 (7.1%), screen exposure in 20 (5.9%), and dehydration in 14 (4.1%) patients. Before pandemic, noises 200 (58.8%), flicker of light 180 (52.9%), weather changes 175 (51.5%), sun light 170 (50%), food 160 (48.5%) and sleep deprivation 130 (38.2%)were the most common precipitating factors of migraine. 40% did not report precipitating factors for migraine before lockdown.

Conclusions

Change of habits during lockdown exposed migraine patients to different precipitating factors. Strong odors, food, sleep disturbance and stress were the most common migraine headache precipitating factors during Covid-19 lockdown.

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Introduction

Severe acute respiratory syndrome caused by SARS coronavirus 2 (SARS-CoV-2) is the new strain that causes Coronavirus disease 2019 (Covid-19).[1] Late February 2020, confirmed cases of novel coronavirus infection were observed in Kuwait. Kuwait government launched a social media campaign encouraging people to stay at home and to follow the instructions of ministry of health. Government started the lockdown from the March 10, 2020. It established a period of travel ban and mandatory stay at home except for emergencies, health problems or regulated shopping only for bare necessities. The period lasted from March 10th until May 31st.[2]

Covid-19 pandemic showed negative impact on migraine patients in Kuwait.[3] Self-isolation and physical distancing strongly impacted population, especially the eating habits and daily behaviors and activities.[4]

Any stimulus that alone or in combination, contributes to the onset of a migraine attack is known to be a migraine trigger.[5] A lot of external and internal stimuli can precipitate migraine attack.[6,7] Migraine triggers could be emotional stress, fatigue, irregular sleep, fasting, physical exercise, hormonal changes, weather changes, sunlight exposure, alcohol consumption, and various sensory stimuli.[8,9] Precipitating factors of migraine headache are different for each migraine patient and may not be the same for different migraine attacks. Migraine attack may be triggered with single trigger or a combination of different triggers.[10] The most commonly reported precipitating factors for migraine headache are specific foods and beverages and usually include dark chocolate, cheese, nuts, coffee, citrus fruits, monosodium glutamate, processed meats, aspartame, fatty foods, and alcohol.[9]

The aim of this study was to describe newly reported migraine precipitating factors reported during lockdown and that the patients did not experience before lockdown.

Methods

Cross-sectional survey was designed to assess the lockdown impact on precipitating factors of migraine headache during Covid-19 pandemic. Online questionnaire was published between 1/04/2020 and 10/04/2020). The questionnaire was sent to migraine patients who were registered at headache clinic in Ibn Sina Hospital. Only Kuwaiti patients were included in the study to avoid bieses related to differences in cultural aspects and lifestyles between Kuwaiti and non-Kuwaiti populations. Google Forms was used to create the questionnaire which was written in English and translated into Arabic. It was reviewed by two independent neurologists. The questionnaire included brief description of the study, informed consent, and questions about precipitating factors of migraine headache during lockdown. The patients were asked if they noticed new to them migraine precipitating factors during the lockdown. If the answer was yes, patients were transitioned to the next question. Patients reported migraine precipitating factors before and during the lockdown.

Personal information was collected to identify patients but this information was kept confidential. Questionnaire was distributed electronically to patients registered in the headache clinic through the WhatsApp application. Patients with migraines with or without auras, as defined by the International Headache Society Criteria for migraine (ICHD-3) and aged between 18 and 65 years were identified to the study.[11] We included only patients who are registered at the headache clinic in Ibn Sina Hospital in Kuwait.

The exclusion criteria were secondary headaches and inability to complete online questionnaires. Participants chose their potential triggers for their migraine attacks from the list of 15 triggers. Migraine headache precipitating factors included stress/emotional changes, sleep disturbance (either excessive sleep or sleep deprivation), physical excretion/fatigue, hormonal changes, weather changes, light, sunlight, noise, odors, fasting/hypoglycemia, dehydration, caffeine, smoking, and food (cheese, chocolate, onion, dairy products or preservative foods). They were selected on the basis of the results of previous studies of migraine triggers.[7,9,12] We added screen exposure such as mobile phone, computer or television screens.

Statistical analysis

The statistical analyses were performed and data were analyzed using SPSS Statistics Software version 26.0 (IBM Corporation, Armonk, NY, USA). Descriptive data are shown as mean ± standard deviation for continuous variables, whereas categorical ones were expressed as proportions and percentages.

Results

A questionnaire was sent to 497 migraine patients who were registered in the headache clinic of Ibn Sina Hospital in Kuwait and diagnosis was based on ICHD-3. 398/497 (80.1%) patients responded. Our cohort included only 340 migraine patients who completed the data. Neurologist JA, who is an expert in headache diagnosis and management reviewed the collected data. The age of patients was 34.65 ± 4.53 years. Most of our cohort were females (79.1%). The majority of the cohort (85%) has more than one migraine trigger. Table 1 and Figure 1 display the triggers of migraine during the lockdown. The most frequent precipitating factors of migraine headache was smell of strong odors (such as Arabic perfumes or intense smoke). It was reported in the majority of our cohorts, i.e. n 214 (62.9%) patients, followed by a certain food item in 175 (51.8%) patients, sleep disturbance in 120 (35.3%), emotional or mental stress in 80 (23.6%), caffeine consumption in 80 (23.6%), flickers of light in 78 (22.9), weather changes in 68 (20.0%), smoking in 65 (19.1%), noise in 56 (16.5), sun light exposure in 41 (12.1%), fasting/ hypoglycemia in 40 (11.7%), hormonal changes in 37 (10.9%), physical excretion/fatigue in 24 (7.1%) patients. Although the screen exposure (mobile phone, computer, television) was more frequent during the lockdown, it was a reported as a precipitating factor in only 20 (5.9%) patients. Dehydration was reported as a migraine trigger in 14 (4.1%) patients. Before pandemic, noises 200 (58.8%), flicker of light 180 (52.9%), weather changes 175 (51.5%), sun light 170 (50%), food 160 (48.5%) and 130 (38.2%) sleep deprivation were the most common precipitating factors of migraine. Forty percent did not report precipitating factors for migraine before lockdown.

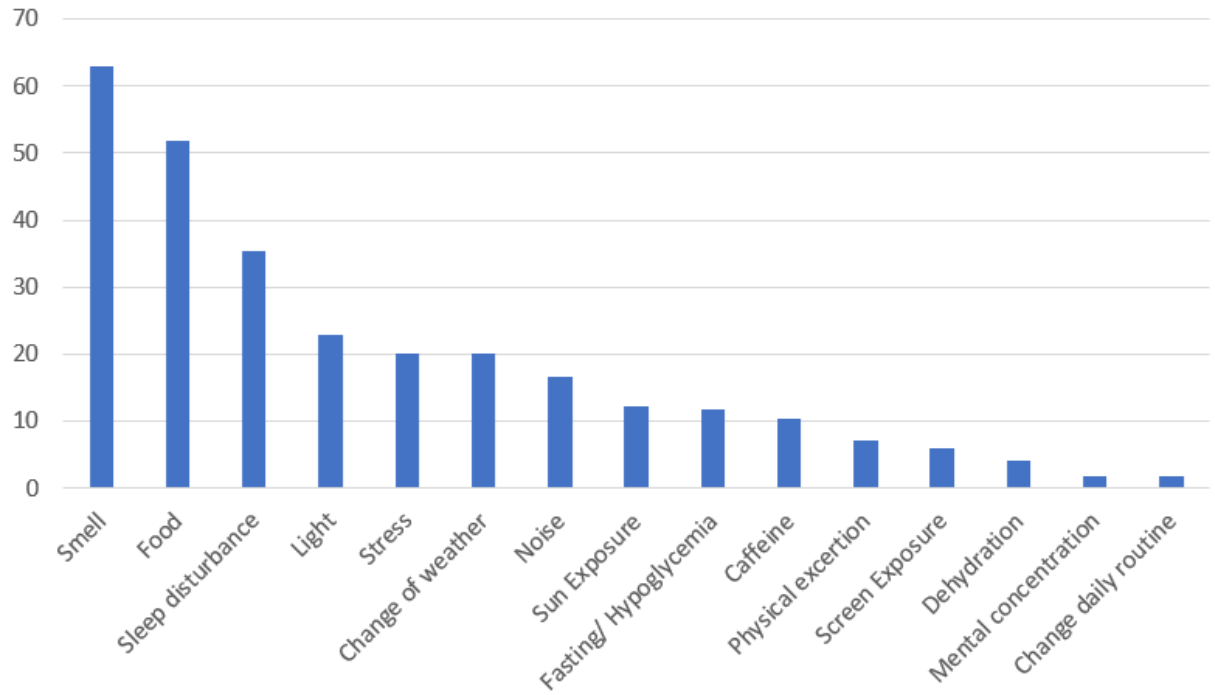

Figure1. Triggers of migraine attacks during Covid-19 lockdown (%).

Table 1. Precipitating factors of migraine headache during Covid-19 lockdown (n=340)

Variables	Number (%)
Smell	214 (62.9)
Food	175 (51.8)
Sleep disturbance	120 (35.3)
Light	78 (22.9)
Stress	68 (20)
Change of weather	68 (20)
Noise	56 (16.5)
Sun exposure	41(12.1)
Fasting/Hypoglycemia	40 (11.7)
Caffeine	35 (10.3)
Physical excretion	24 (7.1)
Screen exposure	20 (5.9)
Dehydration	14 (4.1)
Mental concentration	6 (1.8)
Change daily routine	6 (1.8)

Discussion

Our study registered the change of migraine precipitating factors during the Covid-19 lockdown. Patients who are registered at the headache clinic in Ibn Sina Hospital in Kuwait were included in the study. The cohort in this study reported change of migraine precipitating factors during lockdown. Most patients (85%) had multiple triggers for their migraine attacks. The most frequent trigger factors for migraine were smell of strong odors, certain food items, sleep disturbance, emotional or mental stress and caffeine. Our result is similar to Chabriat et al. finding[13] which reported that food, drinks and sleep disturbance are the most frequently reported migraine precipitants.

Strong odors as Arabic perfumes, incense smoke, and different other strong odors were reported as the most common migraine attacks precipitating factors in 63% of our cohort. Kuwaiti population is known to frequently use Arabic perfume. One of traditional habits in Kuwait is smelling incense. Incense is a bio aromatic substance that releases aromatic smoke upon burning.[14] A lot of people in the Arab Gulf region believe that incense smoke can kill germs and microbes in the air. Previous result showed the association of perfume odors within other factors, such as cleaning, cooking, beauty products, and foul odors with migraine attacks.[12]

Incense smoke consumption has increased during the lockdown. Staying at home increased exposure to incense smoke.

Habits may be changed during quarantine, with the consequent modification in sleeping and eating habits. These changes may worsen migraine during Covid-19 pandemic. Staying at home and consumption of preservative food, due to the restriction in grocery shopping may play a role in precipitating migraine during lockdown Covid-19 pandemic.

Sleep disturbance (35%), and stress (24%) were common migraine triggers in our study and this is consistent with other studies.[7,15,16] Sleep disturbances were reported to be 3 to 17 times more likely to precipitate a migraine in a population-based study.[17] Sleep deprivation causes fatigue that activates sympathetic outflow to boost metabolic process for availability of energy. Sympathetic activation is thought to precipitate migraine.[18]

Our result showed that stress was a common trigger for migraine in 24%, which is similar to result of Uygun and coworkers who reported that stress was one of the migraine triggers in up to 30% of the participants.[19] Continuous information about the Covid-19 from media can also cause stress. Stress also increased due to job loss that affected many people due to the Covid-19. All these factors resulted in more stress to many people and stress is a known migraine trigger. Also, stress may lead patients toward overeating of certain foods that can also precipitate migraine attacks.

Caffeine was a trigger for migraine in 34% of the cohort. Kuwait population consume a lot of Arabic coffee which is rich in caffeine.

Sun light exposure was a trigger of migraine in 12% of the patients. This study was run in April. During this month the sun light is bright with high temperature in Kuwait. The lockdown was staring at 5 pm until 5 am next day. The subjects should finish their necessary shopping, or necessary issues during day time. Sunlight ultraviolet radiation alters calcitonin gene related peptide and nitric oxide release by intraepidermal sensory nerve fibers in the skin.[20] This condition may precipitate migraine attack through vasodilatation. In addition to sunlight brightness, high temperature can be another triggering factor. High temperatures may stimulate cutaneous thermoreceptors, that may precipitate migraine attacks.[21]

Covid-19 pandemic impacted migraine patients negatively in Kuwait. Majority of migraine patients suffered increased migraine severity and frequency in addition to overuse of analgesics during the pandemic.[3] This negative impact can be explained by the changes in life habits and presence of more migraine headache precipitating

factors. The lockdown has caused many changes in people daily life routine. Sleep pattern may have been altered due to the change of work environment such as working and studying from home. Anxiety, and depression may contribute to sleep disturbance. Meal times may also have changed with the temptation to snack, cravings for comfort food and the simplicity of takeaways leading to a change in the balance of carbohydrates, fat and protein. Smoking and caffeine intake may have increased. Some people may have exercises more than usual where others may be finding their lives are more sedentary. So, all these changes can precipitate migraine attacks.

Lifestyle changes can benefit patients with poor sleep quality or physical fitness, though any changes should not result in unnecessary avoidance behavior, which can itself damage quality of life. Patient and education has important roles in the management of migraine.[22] Further research is needed to study migraine triggers in Kuwait populations after lockdown and Covid-19 pandemic and to compare migraine triggers during quarantine to triggers during daily normal life.

Limitation of the study

The study had some limitations. First, we did not compare between migraine precipitating factors before Covid-19 quarantine and during lockdown. Second, we did not assess associations between the precipitating factors and the migraine frequency and severity. Third, all the analyzed data were collected through a questionnaire, thus they were less verifiable than data issued from clinical interview. Forth, this web-based survey has some biases and provides low strength of scientific evidence. Our target was to reach the highest number of migraine patients during the pandemic, and the web-based survey offered the best opportunities to achieve our goal.

Strength of the study

Strength of our study is the first study describe precipitating factors of migraine during quarantine. The headache-specialist neurologists were directly involved in data collection, which made detailed headache history and characteristics more reliable. This study was one of the first studies that investigated the impact of the Covid-19 lockdown on migraine triggers.

Conclusion

During Covid-19 lockdown migraine patients exposed to new precipitating factors during that affect the course of migraine. Smell of strong odors, food, sleep disturbance and stress were the most cited precipitating factors during the quarantine. All these results suggest that lifestyle is a strong determinant of migraine course. The adjustment in lifestyle and stress management should be considered for the management of migraine.

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Authors contribution: JAH, designed the study, reviewed and criticized the manuscript; JA and FA, performed data collection; SFA, designed the study, performed statistical analysis, drafted, criticized, and reviewed the manuscript. All authors read and approved the final manuscript.

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