

ORIGINAL ARTICLE

Impact of an Alcohol-based hand sanitizer usage during COVID-19 pandemic on disulfiram treatment: A South Indian psychiatrist's practice experiences

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Abstract

Background: Alcohol-based hand sanitizer (ABHS) usage has become one of the COVID-19 pandemic-related adapted responses. Some disulfiram-ethanol reactions are reported in people who use alcohol-based hand rub/sanitizer and take Disulfiram as a treatment for their alcohol use disorders. **Aim & Objective:** To determine the practice experiences of psychiatrists on disulfiram prescription to alcohol use disorder victims. **Methodology:** A cross-sectional study on the psychiatrists to find the experiences of disulfiram prescription to their clients with alcohol use disorders during the COVID-19 pandemic. **Results:** Nearly 84 (51%) were reverted with a completed questionnaire. Among the respondents, 28 (33.3%) of the respondents decreased to prescribe Disulfiram, 48 (57.1%) reported that their patients stopped using ABHS due to fear of Disulfiram-Ethanol Reaction (DER), and 20 (23.8%) responders notified that their patients were expressed their worry on DER with Disulfiram and ABHS. **Conclusion:** Disulfiram prescribed for alcohol use disorders; treatment got peculiar experiences with the incidences of DER reported with Alcohol-based hand sanitizer. Many practitioners were scared to prescribe disulfiram due to DER with ABHS. The prevailing evidence that there is no possibility of cutaneous application of ABHS producing enough significant DER. Hence using ABHS is not a contraindication for disulfiram prescription.

Keywords

Alcohol-Based Hand Sanitizer; Addiction; COVID-19; Disulfiram-Ethanol Reaction (DER).

Introduction

Disulfiram has been used successfully over the last six decades for alcohol used disorders (AUD). It is one of the few choices of drugs in the armamentarium of medicines as a long-term anti-craving agent for AUD. Besides the effectiveness and deterrent properties, low-cost, availability, ease to manufacture, and once-a-daily dose are an added advantage of Disulfiram. (1-4) in public

health aspects all these peculiarities of Disulfiram make unique and irreplaceable treatment choices for the management of AUD.

Patients on Disulfiram are known to cause DER when they consume alcohol or alcohol-based products, like lotions, sauces, and deodorants that may have alcohol content also potentially cause DER who are on Disulfiram. (5) This DER consists of palpitations, sweating, shortness of breath, nausea, vomiting, uneasiness, flushing, tightness

of the chest, and in some fatal hypotension and death. (6,7,8)

Alcohol-based hand sanitizer usage has become a new normal and has sharply risen in the COVID-19 pandemic era worldwide. (9,10) However, there are few reports in the literature. In some experimental studies, especially in confined environments, alcohol-based hand sanitizing practices have been concerned about the potentiality of DER in those on Disulfiram. (11,12)

Need for the study: Disulfiram is one of the very limited medications to treat AUD. The COVID-19 pandemic all the governments requested the citizens to use the ABHS or frequent hand was with soap and water. In amidst frequent hand sanitizing procedures by people in the COVID-19 pandemic era, it is curious to know the Disulfiram practices and experiences of DERs among the psychiatrists.

Aims & Objectives

To find the practitioners experiences on ABHS usage and the DER and to create awareness among the practitioners who were scared to prescribe the wonder drug disulfiram due to DER with ABHS during the COVID-19 pandemic.

Material & Methods

To find physicians' experiences on disulfiram prescriptions to their clients where the government mandates using ABHS during the COVID-19 pandemic in a restricted environment between Jan 2021 to July 2021. A cross-sectional study was conducted on the psychiatrists, deaddiction specialists, and addiction medicine practicing psychiatrists of South India. A pre-tested web-based study instrument with twelve questions was designed and validated by the pilot testing of the questionnaire. This study followed a convenient snowball technique to select the study sample. The study questionnaire was made in google form, the link (Google form) was shared in the online professional groups of Telangana and Andhra Pradesh (WhatsApp, Telegram, Emails, and text messages) to the participant psychiatrists and requested the practitioners to circulate it to their fellow practitioners. Before opening the full questionnaire, this study objectives and goals were explained and after accepting the digital consent the full questionnaire will be opened, those who are not willing to participate they can opt no for the digital consent and strait away submit it without participating the study. This study using this practical method of collecting information and their experiences with Disulfiram from practicing psychiatrists and addiction psychiatrists amid frequent sanitizing practices with alcohol-based hand sanitizers during the COVID-19 pandemic by patients with alcohol use disorders. In inclusion criteria, psychiatrists who hold a diploma or degree or super specialty degree in psychiatry including senior residents, work in any sector affiliation with either private or government, and are willing to provide time to participate in the study were included. And the residents

who were pursuing their residency period in psychiatry were not included in the study. There were no financial incentives for participating. The authors assured the anonymity of the participants. This study has been approved by the Institutional Ethics Committee at ESIC Medical College and Hospital, Hyderabad (Ref No. 799/U/IEC/ESICMC/F0230/11/2020).

All potential respondents i.e., psychiatrists, were invited through the professional body (Indian Psychiatry Society) WhatsApp groups or telegram groups, emails, and text messages in person as a convenience sampling method from two regional groups of Telangana and Andhra Pradesh, which lead them to a survey questionnaire in authors created google form. Whereas those were responded to email requested the study participants to share the google form link was asked to forward to their colleagues to participate in this study. Those who we're not responded to the survey were sent a reminder email after three weeks.

Study Questionnaire: To validate the study tool pilot study was conducted with near and out psychiatrists, and the survey questions were refined based on the feedback and results. Explained the purpose and objectives of the study in the first section of the questionnaire. The survey contained 12 questions and took on average 10 min to complete. In the next section of the study, a questionnaire collected disulfiram practicing trends. In the third section knowledge of disulfiram potential while in the context of frequent ethanol-based sanitizers use during this COVID-19 pandemic.

Statistical Analysis: The data were spread into MS Excel software and analyzed with the same. As this was an exploratory opinion-based survey, categorical responses were summarized and expressed with appropriate descriptive statistics such as mean and standard deviation, frequency, and percentages.

Results

Overall, the questionnaire was sent to 165 psychiatrists out of this 84 (51%) were responded. All the participants were well aware of disulfiram-related disulfiram ethanol reaction (DER) and its potentiality in alcohol use either theoretically or practically with their patients with alcohol use disorders (AUD). Most of the 76 (90.5%) study respondents have witnessed their clients have one or more DER episodes in their practice while using prescription disulfiram in AUD patients before COVID-19 pandemic times. Practice experiential responses and knowledge regarding disulfiram medicine in the current times inter-phase between COVID-19 pandemic responses, such as the need for frequent ethanol-based hand sanitizing responses by the people especially among the people with AUD from our colleague psychiatrists in these regions. The details have been provided below in [Table 1](#).

Nearly one-quarter of the practitioners 20 (23.8%) noted that their clients were expressed their concern/worry about DER when they were using the Disulfiram and ABHS. Few practitioners have experienced the disulfiram ethanol reaction (DER) to their clients with ABHS, 2 (2.4%) had mild to moderate DER with sweating & palpitations which were last in a few minutes in this COVID-19 pandemic and 12 (14.3%) were responded that their patients might be experienced the DER with ABHS. Nearly one-quarter of the practitioners were in dilemma whether prescribe the Disulfiram or during the COVID-19 where mandates the alcohol-based hand sanitizer to prevent the COVID infection. To avoid the DER among the disulfiram users who are using hand sanitizers the addiction psychiatrists gave some advice or suggestions, the details have been provided in [Table 2](#).

The disulfiram prescription to the alcohol use disorder individuals by the addiction specialists around 28 (33.3%) was decreased during the COVID-19 pandemic and 56 (66.6%) were no change in prescription, out of 84 specialists none of them was increased their prescription rate during the COVID-19 pandemic. the reasons for the decrease or not increased their prescription have been provided in [Table 3](#).

Out of the 84 practitioners 16 (19.1%) of the practitioners felt there is no need for further research to establish the evidence on ABHS effects on Disulfiram treating patients, they responded that there is already enough evidence available on not possibility of DER with routine using ABHS by the person on Disulfiram. But the majority of the 68 (80.9%) felt there is a need of the hour to study further to establish the substantial evidence on the DER effects of ABHS the details have been provided in [Table 4](#).

Discussion

The result of this study found that the practicing psychiatrists reduced their disulfiram prescription nearly to half for their patients with alcohol use disorder during COVID-19 pandemic. Importantly another finding is that nearly half of the patients who are receiving their Disulfiram in COVID-19 pandemic times also reduced or not at all using alcohol-based hand sanitizers despite the clear and needed instructions to use frequently for the prevention of COVID-19 infections.(9,10,13) Here, a low response rate of 51% explained the requirement of Disulfiram in some subset of alcohol use disorders who are well motivated and having with supervised psychosocial interventions.(2,7,14,15) Among the 84 responses from various psychiatrists reported that only two instances of a mild level of disulfiram ethanol reactions (DER) were noted in patients who use alcohol-based hand sanitizer frequently. This finding is pronounced with available experimental research that in normal practices of alcohol-based hand sanitizers (ABHS) did not reach in amount to cause significant reaction except who inhales profusely or erratically consumes orally or the rare possibility of

prolonged periods stay in closed space's chance to excess inhalation. (16,17) Reasonably, our novel finding that only two subjects' observation of DER by two respondents may have a chance to explain by erratic practices of ABHS use or other concomitant plausible invisible potential factors too in the causation of DER in that rare finding, (16,17) though it's mild in severity.

More than 50% of practicing psychiatrists expressed their uncertainty while prescribing Disulfiram to their alcohol use disorder patients during COVID-19 pandemics. Reasonably, before COVID-19 pandemics, academically we were giving instructions as precautionary or warning notes to our patients before prescribing the Disulfiram such as needed to avoid consumption or superficial usage of alcohol/ethanol/isopropanol contained products, to prevent the disulfiram ethanol reaction(DER) means that prevailing belief was even superficial or cutaneous application of various types of ethanol may reach systemic circulation and may produce disulfiram ethanol reaction (DER). (18) This practice becomes standard of operations for disulfiram use before taking consent to prescribe as a warning or precautionary notes. (19)

Recent experimental studies found that except in contained environment and with high quantity inhalation of ethanol-based hand sanitizers usage, only have chance to produce significant disulfiram ethanol reaction (DER) though in a mild form. (16) this evidence disproves the prevalent beliefs that practice such as cutaneous or superficial application of hand-based sanitizers which contain ethanol or iso propranolol may reach significant enough to produce disulfiram ethanol reaction (DER). Also, it implies that at this COVID-19 pandemic related frequent ABHS use juncture, precautionary notes before prescribing Disulfiram needed to change which we practicing psychiatrists following since long.

Importantly Disulfiram, a choice of anti-craving medicine in alcohol use disorders, which intended to produce a deterrent disulfiram ethanol reaction in a person who consumes a significant level of alcohol or ethanol (12.5 ml and above IMFL) in any format. (20)

In general, Disulfiram is one of the medicines which will be used to treat alcohol use disorder patients, especially people who are motivated enough to abstain from alcohol. (19) This Disulfiram though not exactly useful in aversion purpose but as a therapeutic choice of self-efficacy enhancing principle. (7) Here Disulfiram has dose-dependent manner production of disulfiram ethanol reaction (DER) noted with alcohol. (7,21) However in literature, it is noted that at least half the international unit of alcohol (40 % alcohol-related spirits) requires to produce minimal significant disulfiram ethanol reaction (DER). In supervised dispensing practices with Disulfiram having shown higher success rate and abstinent outcomes noted while compared to controls, Hedges'g = .58 (95%CI =.35-.82) (22,23). Even this study with an online survey from practising psychiatrists in this region witnessed the

best possible utility with this medicine along with other psychosocial interventions in the management of alcohol use disorders. However, this study highlights the worrisome point is holding the ambiguity in prescribing Disulfiram and low prescription rates amidst COVID-19 pandemic responses. As a limitation, this study designed to be a correctional form of collecting the information on disulfiram use and its practice experiences from the general psychiatrist professionals to get the trend highlights that if this trend of disulfiram use may continue in this manner, which may make a further loss by not prescribing this essential medicine to some subset of alcohol use disorder patients who are eligible to prescribe. Hence, we recommend much more high studies with high powered experimental and prospective observational evidence required to address the lacunae in the knowledge of disulfiram usage in alcohol use disorders. Academically this study impacts psychiatry training regarding disulfiram usage by modifying the precautionary notes accordingly. Clinical practice level this Disulfiram shall not be lessened in use by making as a not suitable choice for the AUD population in the amidst of non-evidential apprehensions with frequent alcohol-based hand sanitizer usage in the COVID-19 pandemic era. Hence utmost importance is modifications are required while prescribing Disulfiram especially with contraindicated instructions while using alcohol-based aftershave lotions, deodorants etc., and disseminating the evidence by focused research in this area.

Conclusion

Despite the small number of psychiatrists who responded, this study on Disulfiram uses strongly exposed the beliefs about their apprehensions in using disulfiram prescription to needy alcohol use disorder patients. Disulfiram medicine utilized for alcohol use disorder treatment got peculiar experiences with the incidences of DER reported with Alcohol-based hand sanitizer. Many practitioners were scared to prescribe disulfiram due to DER with ABHS during the COVID-19 pandemic. Currently, for alcohol withdrawal, minimal medications like disulfiram is available, but there is no evidence of ABHS producing DER in Disulfiram treated patient. More than 97.6% of respondents did not observe any instance of significant DER in their AUD patients while on Disulfiram.

Recommendation

Against the prevailing experimental evidence of not a possible cutaneous application of ABHS producing enough significant DER. Hence using ABHS is not a contraindication for disulfiram prescription.

Current study requires to modify precautionary notes while prescribing Disulfiram to utilize appropriately, not biased with misconceptions.

The majority were reported uncertainty regarding the ABHS use potentiality in causing DER while using Disulfiram, hence additional research was warranted in

this area with various demographic and alcohol-related variables.

Limitation of the study

This study was taken up in a constrained environment through the convenient sampling technique. The chances sampling errors like selection bias may be there. Even after repeated reminders the busy practitioners might not respond who were serving the major junk of patients.

A more systematic sampling method can be adopted to improve the generalizability of the findings. A further limitation of the current study is the possibility of participants giving socially accepted responses. As this study was conducted online self-reported, there is a possibility of participants answering positively than actually practicing.

Relevance of the study

There is no need to worry about the usage of alcohol-based hand sanitizer and the prescription of Disulfiram to those who are willing to withdraw their habit of chronic alcoholism. The wonder drug which is available for withdrawal of alcohol can be prescribed irrespective of the frequency of cutaneous usage of alcohol based hand sanitizer.

Authors Contribution

All authors are contributed equally.

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Tables

TABLE 1: DISTRIBUTION OF PARTICIPANTS BASED ON USAGE OF DISULFIRAM (N = 84)

| Criteria | Yes | | No | | Total | |
|---|-----|------|----|------|-------|-----|
| | No | % | No | % | No | % |
| Any of your patients are currently receiving Disulfiram in this COVID-19 Pandemic times? | 46 | 54.8 | 38 | 45.2 | 84 | 100 |
| Any of your patient who is receiving Disulfiram currently, also using alcohol-based hand sanitizer frequently at COVID-19 pandemic times? | 36 | 42.9 | 48 | 57.1 | 84 | 100 |
| Did any of your patients report any concern or worry about DISULFIRAM ETHANOL REACTION (DER)? | 20 | 23.8 | 64 | 76.2 | 84 | 100 |

TABLE 2 WHAT ARE THE SUGGESTIONS/ADVICE GIVEN TO DISULFIRAM USE DURING COVID-19 TIMES?

| Criteria | Yes | | No | | Total | |
|--|-----|------|----|------|-------|-----|
| | No | % | No | % | No | % |
| Avoid alcohol contained hand sanitizer | 12 | 14.3 | 72 | 85.7 | 84 | 100 |
| Avoid prescribing Disulfiram as a treatment for AUD during COVID-19 pandemic | 6 | 7.1 | 78 | 92.9 | 84 | 100 |
| Advise to use soap and water use in place of ABHS | 5 | 6.0 | 79 | 94.0 | 84 | 100 |
| Continue Disulfiram, as usual, no extra precautions or suggestions requires as cutaneous absorption may not be significant enough to produce DER. | 10 | 11.9 | 74 | 88.1 | 84 | 100 |
| Reduce the times of use with ABHS, utilize with another sanitizer including soap and water while the times of disulfiram use | 6 | 7.1 | 78 | 92.9 | 84 | 100 |
| Avoid all hand sanitizers while using Disulfiram | 4 | 4.8 | 80 | 95.2 | 84 | 100 |
| Any liver and cardiac disease patients should avoid taking Disulfiram medication | 2 | 2.4 | 82 | 97.6 | 84 | 100 |
| If DER precipitates are advised for admission and monitoring | 2 | 2.4 | 82 | 97.6 | 84 | 100 |
| Advised to patient use lesser percentage of alcohol-containing sanitizers | 2 | 2.4 | 82 | 97.6 | 84 | 100 |
| What tailor-made intervention you have given as a treatment for the expectation of DER (DISULFIRAM ETHANOL REACTION) in this context? | | | | | | |
| Creates awareness for DER and advice for alcohol-free hand sanitizer use and soap water method cleaning. | 2 | 2.4 | 82 | 97.6 | 84 | 100 |
| Advice to stop further use of ABHS and make to visit the hospital as early as possible | 4 | 4.8 | 80 | 95.2 | 84 | 100 |
| Supplemental oxygen, intravenous fluids if hypotension, tachycardia, thiamine supplementation and supportive therapy. | 6 | 7.1 | 78 | 92.9 | 84 | 100 |
| Vit C injection and supportive intravenous fluids | 2 | 2.4 | 82 | 97.6 | 84 | 100 |
| Management of ABC (Airway, breathing circulation) | 2 | 2.4 | 82 | 97.6 | 84 | 100 |
| Non-specific (Crisis intervention, alcohol, selecting other alternative medicines like baclofen, acamprosate, topiramate etc., precautions while using Disulfiram, not given treatment till yet, hand wash with soap water | 30 | 35.7 | 54 | 64.3 | 84 | 100 |
| Not applicable | 36 | 42.9 | 48 | 57.1 | 84 | 100 |

TABLE 3 DISTRIBUTION OF REASONS FOR THE DECREASE OF THE PRESCRIPTION RATE OF DISULFIRAM TREATMENT TO AUD AT THE TIME OF COVID-19

| Criteria | Yes | | No | | Total | |
|--|-----|----|----|----|-------|-----|
| | No | % | No | % | No | % |
| Fear to have DER | 4 | 5 | 80 | 95 | 84 | 100 |
| Due to increased online teleconsultations, monitoring difficult for Disulfiram | 2 | 2 | 82 | 98 | 84 | 100 |
| Don't know how COVID-19 illness interact with Disulfiram | 2 | 2 | 82 | 98 | 84 | 100 |
| Another safe alternative available in the treatment of AUD | 6 | 7 | 78 | 93 | 84 | 100 |
| Didn't find motivated enough patients with AUD for the treatment of Disulfiram in COVID-19 times | 8 | 10 | 76 | 90 | 84 | 100 |
| Possibility of DER in illiterate people and improper use chance with ABHS | 2 | 2 | 82 | 98 | 84 | 100 |

TABLE 4 CONCERNING DISULFIRAM PRESCRIPTION AND FREQUENT ALCOHOL-BASED HAND SANITIZER USE AT COVID-19 TIMES?

| Criteria | Yes | | No | | Total | |
|--|-------|----|-------|----|-------|-----|
| | count | % | count | % | count | % |
| Studies are more required on this topic. No opinion on this at this juncture. | 40 | 48 | 44 | 52 | 84 | 100 |
| ABHS must be used only in hospitals, whereas for the public advocating to use non-alcoholic or ethanol-free sanitizer | 2 | 2 | 82 | 98 | 84 | 100 |
| Use soap water to clean the hands always in the place of ABHS for the patients who are on Disulfiram | 2 | 2 | 82 | 98 | 84 | 100 |
| Avoid the prescription of Disulfiram | 4 | 5 | 80 | 95 | 84 | 100 |
| Close monitoring and avoiding the prescription of Disulfiram for heavy alcohol users. | 4 | 5 | 80 | 95 | 84 | 100 |
| Disulfiram is prescribed but advises the patient to use soap water to clean rather than sanitizer use | 16 | 19 | 68 | 81 | 84 | 100 |
| Nonspecific | 8 | 10 | 76 | 90 | 84 | 100 |
| High chance of DER | 6 | 7 | 78 | 93 | 84 | 100 |
| If not properly educated and precautions explained well, there will be the chance to oral ingestion of alcohol-based hand sanitizer due to the non-availability of alcohol in a ban on alcohol times of this pandemic. | 2 | 2 | 82 | 98 | 84 | 100 |
| Adequate psychoeducation | 6 | 7 | 78 | 93 | 84 | 100 |