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Using Social Media to Debunk Covid-19 Myths

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***Abstract*—*Considering the COVID-19 pandemic, it is noteworthy to highlight a huge stream of misinformation and false treatment methods that emerged during this troubled period, in parallel with the need to obtain data quickly, a real race of publications of scientific works of dubious character and low scientific accuracy was started, being a major contributor to the giant wave of false information that can become as harmful as the infection itself. Two drugs that have gained notoriety in this period, Hydroxychloroquine and Ivermectin, both have studies developed or in development on their effectiveness, but there is still not enough evidence for the use of Ivermectin in a treatment protocol for COVID-19. Based on the data obtained through the form widely disseminated in social media, it was possible to reach 983 participants. Therefore, in the absence of studies and of a specific antiviral for the treatment of COVID-19, it is necessary for the doctor to make a decision, in agreement with the patient, to use the drug that best fits the condition presented, that is, to individualize the therapy and always think about the relationship between benefits and possible side effects. Moreover, it is essential to emphasize that non-pharmacological measures play a key role in preventing COVID-19, thus, their use should be more encouraged than the use of drugs that have no scientific proof in vivo in the treatment and prevention of this pathology.*

I. INTRODUCTION

In December 2019, a new disease emerged in the city of Wuhan, located in China. The respiratory syndrome is caused by a coronavirus, dubbed SARS-CoV-2, being the cause of the disease COVID-19 and the precursor to a pandemic. Various consequences of this global outbreak can be seen in many different spheres. Considering this whole picture, it is noteworthy to highlight a huge stream of misinformation and false treatment methods that emerged during this troubled period, in parallel with the need to obtain data quickly was started a real race of publications of scientific works of dubious character and low scientific accuracy being a major contributor to the giant wave of false information that can become as harmful as the infection itself (ALVAREZ et al., 2020).

SARS-CoV-2 in the initial phase does its viral replication mainly in the respiratory tract. It binds to the ACE2 receptor (angiotensin-converting enzyme 2) to

mediate its entry into the cell by endocytosis, and its entry is managed by a membrane protein called protein S. Chloroquine and hydroxychloroquine (CQ and HCQ respectively) could theoretically neutralize cell pH and prevent viral proliferation, and also have immunoregulatory activity by interfering with the inflammation process. However, no rigorous preclinical studies in cells or animals have been conducted to investigate these mechanisms or the efficacy of covid-19 treatment *in vivo*. In contrast, its adverse effects are very evident and the inappropriate use can cause from poisoning to death of patients (BIGUETTI; MARRELLI; BROTTO, 2020).

Ivermectin is an anti-parasitic agent that in recent years has demonstrated efficacy in tests against a mild species of virus, and has also shown anti-viral efficacy *in vitro*. This drug can inhibit the import of nuclear material and proteins from the host. Ivermectin is well tolerated *in vivo* by most patients, is mostly excreted in the feces, and has few lethal cases in humans. However, there are neurological adverse effects that can arise with its use and last up to seven days: confusion; tremors; convulsion; local swelling; vomiting. These results showed that there would be the possibility of Ivermectin having results against Covid-19, however, it is still necessary an extensive survey of data from *in vivo* tests, besides putting in the balance possible positive results versus adverse effects (MOLENTO, 2020).

The numerous treatments and prophylactic methods that have emerged in this period still lack more detailed studies on their clinical efficacy, in the absence of such research and of a specific anti-viral, it becomes, therefore, a doctor's decision, by the patient, to use the drug that best fits the presented picture, that is, individualizing the therapy and always thinking about the relationship of benefits and possible side effects (ALVAREZ et al.,2020).

II. METHODOLOGY

This is an exploratory, descriptive, and quantitative study, conducted online, which can reach people of different ages and genders.

An online form was developed using the Google Forms tool to obtain information from the population about some attitudes that were taken during the pandemic in the year 2020. It is important to note that no personal data was required to participate in this research, and it did not need to be approved by the Research Ethics Committee (Comitê de Ética e Pesquisa - CEPE, in Portuguese). In addition, the purpose of the research was informed on the form itself, as well as that the results obtained would be used exclusively for scientific purposes.

The form was prepared by the authors and advisor themselves and presents 14 objective questions addressing the use of Hydroxychloroquine and Ivermectin for treatment and/or prevention, as well as possible complications, whether or not they were prescribed, whether or not people know what the effectiveness of Hydroxychloroquine means only in *in vitro* studies, and whether or not they believe in the efficiency of the pharmacological and non-pharmacological measures that are employed in this period.

An immeasurable target audience was reached since it is an online form that could be widely disseminated in a territory without borders called the internet. It is worth mentioning that each author shared on their social media (WhatsApp, Instagram, Facebook) for three months (August, September, and October 2020) and it was possible for third parties to share it again and, thus, further increase the N sample enabling it to reach several states in Brazil and even outside Brazil.

III. RESULTS

Analyzing the form, a total of 983 participants were obtained and all questions were answered by them. When asked whether they had symptoms or were diagnosed with COVID-19, 31.1% answered yes, while 68.9% answered no. Regarding the use of Ivermectin, 51.3% denied using it, in contrast, 48.7% affirmed using it, subsequently, when asked if it was with a doctor's prescription and 23.1% affirmed that it was prescribed by a doctor.

As for the use of Hydroxychloroquine, 87.8% denied using it, while 12.2% affirmed using it. It was also asked if there was a prescription for this drug, 83.6% answered that they did not use it, 10.8% said it was prescribed, and 5.6% denied the prescription.

Furthermore, when asked about the purpose of using Ivermectin, 51% did not use it, 28.6% used it only for prevention, 7.8% used it only for treatment, and 1.5% used it for both prevention and treatment.

When asked if they felt any unwanted side effects from using Ivermectin, 50.8% did not use it, 44.6% denied any side effects, and 4.7% said they felt any unwanted side effects. When it came to unwanted side effects with the use of Hydroxychloroquine, 85.4% did not use it, 11.5% denied having felt any side effects, and 3.2% claimed to have felt side effects.

To characterize the participants' knowledge about the subject, they were asked if they knew what it meant for

Hydroxychloroquine to have its efficacy against COVID-19 demonstrated only in *in vitro* studies, with 59% answering yes, 29.8% answering no, and 11.8% answering maybe.

Concerning the use of Ivermectin, the participants were asked if they believed that this drug was what treated or prevented them against the disease, 53.3% answered no, 33.8% answered maybe and 12.9% answered yes. And when the same question was asked about Hydroxychloroquine, 65.7% said no, 25.3% said maybe, and 10% said yes.

On the other hand, it was also approached about the non-pharmacological measures in preventing COVID-19, the participants were asked if they thought that the use of masks, alcohol gel and hand washing are efficient in preventing COVID-19, 78.9% answered yes, 13.5% answered maybe, and 7.5% answered no. Finally, the participants were asked if they make frequent use of these non-pharmacological measures, 86.8% answered yes, 6% answered no, 6.2% answered once in a while, and 1% answered that they seldom adopt these measures.

IV. DISCUSSION

From these results, it is possible to see that the public reached was extremely significant, contributing to the research's greater relevance. Moreover, fortunately, most of the participants did not use these drugs, which is something positive because there is no scientific proof of efficacy *in* vivo both for the treatment and prevention of COVID-19.

It is important to note that within the sample space we obtained, those who made use of pharmacological measures opted mainly for Ivermectin for the purpose of prevention and treatment. It is worth noting that there is an *in vitro* study in which Ivermectin was shown to reduce 93% of the genetic material of the virus in 24 hours and a 99.8% reduction after 48 hours (MARRA et al., 2020). Despite the satisfactory results, this drug has not yet been tested in people with COVID-19 and we do not know if the dose allowed for use in humans is effective in treatment.

It should be noted that *in vitro* studies with promising results are not always effective in subsequent phases. This occurred with Ivermectin itself, which had shown an *in vitro* effect in inhibiting other viruses, such as Dengue, HIV, Influenza, and Zika viruses. However, in animal and human studies, the results were not satisfactory. A phase III clinical trial conducted in Thailand in 2014-2017 that evaluated the use of Ivermectin in the treatment of Dengue showed that the drug did not demonstrate any change in viremia or clinical benefit. In an animal model study, Ivermectin was found to be ineffective in preventing a lethal Zika virus infection. Clinical studies with scientific rigour are still needed to assess whether Ivermectin, independent of other confounders, has any benefit for the treatment of COVID-19 (MARRA et al., 2020).

In the survey, there was a small percentage (4.7%) that reported having presented some unwanted side effects due to the use of the drug. In general, the adverse reactions related to the use of Ivermectin are mild and transient, diarrhea, nausea, asthenia, abdominal pain, anorexia, constipation, vomiting, dizziness, drowsiness, dizziness, tremor, pruritus, rashes and urticaria may occur (MARRA et al., 2020).

With regard to Hydroxychloroquine (HCQ), it was observed that participants used it more for treatment, but there were also those who used it for prevention but to a lesser extent. A recent gold standard, randomized, double-blind, placebo-controlled trial in the United States and parts of Canada tested HCQ as post-exposure prophylaxis in 821 individuals. This trial reported that HCQ did not prevent COVID-19 compliant disease or confirmed infection when used as post-exposure prophylaxis within 4 days of exposure. The concept of using Chloroquine (CQ) / HCQ as prophylactic or therapeutic alternatives for SARS-Cov-2 infection is hypothetical at best, but its side effects are real. In fact, CQ / HCQ could contribute to the exacerbation of musculoskeletal diseases in elderly people at risk of developing severe COVID-19. Moreover, some of the characteristics of rheumatic patients at risk of developing CQ and HCQ-induced myopathies are advanced age and other notable underlying features (BIGUETTI; MARRELLI; BROTTO, 2020).

To further reinforce this, in two other studies published in the New England Journal of Medicine using Hydroxychloroquine as prevention in one study and as treatment in the other, there were also no positive results. The study that tested the efficacy of HCQ as prevention of COVID-19 was an open-label, randomized trial conducted in Spain using 2314 asymptomatic healthy contacts from 672 patients with a diagnosis confirmed via PCR (polymerase chain reaction), concluded that post-exposure therapy with HCQ did not prevent symptomatic SARS-Cov-2 infection in healthy people exposed to a PCR positive patient for COVID-19, it was also observed that the number of adverse effects reported was 56% in the group that used HCQ versus 5.9% in the control group (MITJÀ et al., 2020). In the other study testing the effect of HCQ in hospitalized patients with COVID-19, it is an

open-label, the randomized contralateral study selected 1561 patients to receive HCQ and 3155 as a control group, the results suggested that patients in the HCQ group were less likely to leave the hospital alive within 28 days than those in the control group (59.6% left alive in the HCQ group vs. 62.9% in the control group), and among patients who were not on mechanical ventilation, those belonging to the HCQ group went more often too invasive mechanical ventilation or even to death (30.7% in the HCQ group versus 26.9% in the control group), with this the study concluded that patients who used HCQ did not have a lower incidence of death within 28 days than the control group (HORBY et al., 2020).

Furthermore, it was possible to see in the research that, proportionally, the percentage of unwanted adverse effects in the use of each of these drugs, the one that presented a higher prevalence rate of adverse reactions was HCQ. There is abundant evidence of its very harmful side effects, and inappropriate prescribing can cause acute poisoning and even death. Due to their lysosomal affinity, CQ and HCQ accumulate in cells of various tissues with consequent tissue damage in liver, retinal, skeletal, and cardiac muscle cells. As announced by the FDA on April 7, 2020, HCQ side effects include irreversible cardiac effects (including cardiomyopathy and QT interval prolongation), proximal myopathy, and neuropathy (BIGUETTI; MARRELLI; BROTTO, 2020).

Results show that HCQ can efficiently inhibit SARS-CoV-2 infection *in vitro* (RANGEL et al., 2020). When analyzing the answers of the form, it can be seen that most (59%) know the meaning of the term *in vitro*, however, this did not prevent the use of drugs that showed efficacy only in this circumstance. In Brazil, a phase 2 clinical trial of COVID-19 sponsored by the state of Amazonas was suspended after 25% of patients developed prolongation of the QT interval (>500m/s) due to cardiotoxicity (BORBA et al., 2020). Therefore, the reflection regarding the indiscriminate use of these drugs is whether it is worth taking the risk of developing these adverse reactions that can sometimes be irreversible.

Despite scientific evidence showing that HCQ and Ivermectin are not recommended as a treatment and/or prophylaxis for COVID-19 due to lack of evidence proving their efficiency, 12.9% believe that Ivermectin was what treated or prevented against COVID-19 and 24.3% were in doubt. This doubt or even belief may be due to the dissemination of untrue information about the effectiveness of these drugs, causing many people to choose self-medication believing it to be the best alternative available at the moment.

The results regarding the effectiveness of the masks were contradictory, initially due to the lack of definition of the type of masks used in the studies: most use only the generic term “masks” or “face masks”. There was, however, a significant result for TNT face mask use and reduced risk of developing an influenza-like respiratory illness. The use of standard TNT face masks has been noted as an important barrier to droplet and aerosol dissemination in the face of COVID-19, even with its limitations of not having the filtration capacity for dental-medical-hospital environments (CAMARGO et al., 2020).

Another fundamental element to be considered, the use of a mask does not reduce or replace the need for the recommended hygiene measures, especially hand washing, and the maintenance of a distance of more than 1 (one) meter between people (CAMARGO et al.,2020).

Inevitably, hands become one of the main routes of contagion by touching contaminated surfaces and people and must be frequently sanitized to prevent the spread of the virus. Sanitization through constant and correct washing with soap and water and/or the use of alcohol-based disinfectants, specially ethanolic or isopropyl solutions, are the most recommended methods (SEQUINEL et al., 2020).

Regarding the non-pharmacological preventive measures for COVID-19 (use of masks, hand washing, use of alcohol gel or liquid), most of the participants (79.9%) believe in their preventive capacity. However, a portion of people (7.5%) do not believe in these prophylactic means and 13.5% are doubtful whether or not they work. The participants were also asked if they use them frequently, 86.6% said yes, 6% said no, 6.2% said they use them once in a while, and 1% rarely. Thus, it is noticeable that there are doubts about the subject that deserve to be clarified with scientific support and require more propagation than pharmacological measures since prevention is, without a doubt, the best alternative.

V. CONCLUSION

The research was of great relevance since it provided knowledge about the subject besides making unequivocal the importance of not self-medicating without consulting a doctor, since studies are absent and of a specific anti-viral for the treatment of COVID-19, thus it is essential to make a medical decision by the patient to obtain significant results in the treatment and prevention of symptoms caused by the virus. The study was concluded positively, the objectives were reached and the authors feel satisfied with the result because through the research an evaluation was made in favour of demystifying myths of a disease that is still being studied by scientists.

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