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LETTER TO THE EDITOR

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The rampant use of cow dung to treat COVID-19: Is India at the brink of a zoonotic disease outbreak?

Dear Editor,

The second wave of COVID-19 that hit India in April 2021 has wreaked havoc nationwide. For a country that stands as the second-largest country by population and is reporting around 300 000 new cases per day, strategizing and forming policies to mitigate the outbreak has been an ongoing uphill battle.[1,2] As the supply of oxygen cylinders becomes increasingly scarce and the availability of hospital beds becomes close to none, the Hindu believers, like many other populations, have resorted to nonevidence-based treatments for COVID-19—in particular, using cow dung and urine to curb the disease.[1] This article aims to raise awareness about the dangers associated with these practices; how they can breed, nurture, and inevitably lead to the outbreaks of preventable zoonotic diseases, and the need to bring them to a halt promptly.

In Hinduism, cows are considered to be sacred creatures and their by-products, including cow dung, urine, and milk, to be purifying and antiseptic agents.[3] Hence, with the surge of COVID-19 cases, there has been a reported surge in the use of cow dung and urine to boost immunity against the coronavirus. The ritual involves participants visiting cow shelters in groups and rubbing a mixture of cow dung and urine on their bodies. While awaiting the batter to dry, they indulge in practices to heighten spirituality like hugging the cows or performing yoga.[1] However, since the ritual involves gathering in large groups at the cow shelters, participants are at risk of both, potentiating the spread of the COVID-19 and accelerating the emergence of several zoonotic diseases as well as many vector-borne diseases like dengue, yellow fever, and zika.[4–6]

Among the diseases that can be transmitted through human contact with bovine by-products are Tuberculosis (*Mycobacterium bovis*), brucellosis (*Brucella abortus* and *Brucella melitensis*), dermatophytosis, Q fever, chlamydiosis (*Chlamydophila psittaci* and *Chlamydophila abortus*), leptospirosis, *Mycobacterium paratuberculosis* (that may be associated with Crohn's disease in people), campylobacteriosis, salmonellosis, listeriosis, cryptosporidiosis and infections with pathogenic strains of *Escherichia coli*.[7]

In fact, there are numerous diseases that can be transmitted to humans through contact with cattle; however, the overlapping of symptoms between these and non-zoonotic diseases leads to their underdiagnosis. For example, there is bovine tuberculosis, which is a threat in countries like India, where it has not been eliminated due to the lack of strong programs to control animal diseases. However, there is a lack of reliable data, as the indistinguishable clinical presentation of non-zoonotic tuberculosis leads to the underdiagnosis of the former. Another example of overlapping symptoms leading to underdiagnosis is Q fever, whose clinical picture is similar to that of influenza. Directly linked to contact with cow feces, it is important to highlight the reports of gastrointestinal diseases secondary to the fecal-oral transmission of Cryptosporidium spp. and Giardia spp.[8]

Other zoonotic diseases, including plague, brucellosis, and anthrax, have a long history in India due to the aforementioned rituals, extensive agricultural practice, and the abundance of vectors.[9,10] Since approximately 80% of the Indian population lives in close proximity with cattle and poultry, they are vulnerable to infected livestock.[9] In fact, the actual burden and the true incidence of zoonotic diseases largely remains unreported; for Brucellosis for example, it is estimated to be 25 times higher than the published cases due to underdiagnosis.[9] Although emerging zoonotic pathogens are mainly wildlife-associated in origin, livestock-associated zoonotic diseases occur in densely human-populated regions around the world—especially developing countries where it is difficult to distinguish the source of exposure to the pathogen; it can be occupational or at home.[11] Backyard poultry keeping has been widely linked to Avian Influenza transmission.[11] Hence, this coupled with the lack of adequate healthcare facilities, triage of limited resources toward tackling the COVID-19 crisis, and unavailability of diagnostic tests in the rural areas further warrants immediate attention toward the emerging public health crisis, a foreseeable zoonotic disease outbreak.

The rampant spread of misinformation that has led to the ritual of using cow dung and urine can be attributed to the practice being endorsed by politicians, authorities, and government bodies through interviews with the media, speeches, and official documents.[1] Notable example of this is the episode in 2019 where the Minister of State for Health and Family Welfare of India, Ashwini Choubey, endorsed the use of cow urine in studies to develop medicines for the cure of cancer.[12] Last year, a ruling party Legislator in India claimed that fumes released by burning cow dung can prevent viral infections, and this year, another ruling party Legislator urged on using diluted cow urine to treat COVID-19.[1] In contrast, communication initiatives by the Government, including telecasting videos, although included scientifically authentic information and animations, however, failed to design communication that targeted the needs of different communities. Through these videos, the common man could not have understood the detrimental consequences of contracting the virus and spreading it to others.[13]

On the contrary, numerous warnings have already been issued by the medical and scientific community about the significant risks that such a practice presents for individuals.[1] In fact, a previous study already pointed out that the use of cow urine concoction (CUC) could result in death from intoxication. Among the reasons for this is the presence of

toxic compounds, such as benzoic acid, phenylacetic acid, thymol, and nicotine in CUC.[14]

Despite strong evidence pointing to the dangers of the practice, seeking refuge, in the absence of definitive treatment, in their personal or popular beliefs based on their level of knowledge, is one of the main reasons why it is still widely spread by people.[15] Therefore, it was already expected that feces, urine, and other bovine by-products as a form of medicine or prophylactic agent would gain momentum again, mainly due to the current state of public health in the country. Furthermore, this practice is more prevalent among the population that has limited access to quality information and education, a population that is one of the most affected by the lack of effective strategies to control COVID-19 in the country. Thus, disseminating accurate and authentic knowledge to the masses has become imperative, now more than ever.

However, this is hindered by the enormous endorsement the ritual receives from the current government. According to a news report from 2016, in the past decade, India's Council of Scientific and Industrial Research has spent around 50 million dollars on patent applications for using cow urine in energy drinks, chocolates, and medicines. The current nationalist ruling party is famous for notoriously advertising the medicinal virtues of consuming cow urine.[16] Thus, it becomes incredibly difficult to emphasize the dangers of the practice when it is popularized by the government of a country.

The first step toward addressing this public health issue is acknowledgment. Authorities need to acknowledge the detrimental consequences associated with the ritual of using the by-products of cow dung and urine to initiate mass awareness in the population and in other spheres of society, such as religious leaders and faith communities. Awareness and surveillance are the keys to preventing zoonotic diseases,[17] authorities need to raise awareness about the lack of association of antiviral benefits with the consumption or smearing of cow dung and urine. It is necessary to inform people that there is no scientific basis for relating the use of cow dung and urine to combat infectious diseases such as COVID-19. Furthermore, it is necessary to clarify basic aspects of the virus' action in the body and that cow dung and urine do not have substances necessary to stimulate the human immune system to fight or protect itself against the disease. Moreover, it should be emphasized that the bovine fecal matter, in addition to the dreaded zoonoses, is a source of transmitting diseases like giardiasis, tuberculosis, and *E. coli* diarrhea; it is even linked to the emerging epidemic of Mucormycosis (the black fungus).[1,18] In addition to that, effective communication needs to be established with the people living near the animals so that the resurgence of any zoonotic disease can be caught, contained, and reported before it causes much harm.

For this, it is necessary that a multidisciplinary strategy, involving the different spheres of society, is adopted. Such awareness campaigns should involve the medical and scientific community, political figures, government bodies, and public figures, such as influencers and artists. Although a contributing factor in the spread of misinformation, the mass media can have a notable effect if used in health education strategies and to drive public awareness of the potential risks associated with the use of cow dung and urine. Furthermore, the authorities also need to improve regulatory mechanisms to oversee and punish talk shows, journals, and other forms of mass media that disseminate misinformation. The government must also prohibit the collection of cow dung and urine for this purpose, and institute health safety and inspection rules.

None of this will be effective, however, if the initiative is not also supported by religious leaders and religious communities. For this, it is necessary that they are contacted and are aware of the risks present in the practice and that going against it is not a disrespectful posture against the Hindu religion and culture. For this, it is necessary to develop educational programs also focused on raising awareness and informing authorities and religious figures about the risks associated with the use of cow dung and urine to cure diseases.[1] Using simple language to bring medical-scientific topics into people's daily lives while respecting religious and cultural issues could be a useful first step toward promoting behavioral changes in society. Readers, physicians, and the scientific community may all help by advocating the cause and emphasizing the importance of changing the current perspective on the practice.

India is a country that is replete with culture, traditions, and heritage that date as far back as the fourth millennium B.C.[19] These traditions and customs have been inherited over centuries and continue to serve as a source of solace to people who practice them. However, with no concrete scientific background to back these practices and indisputable evidence that they pose a threat to the population putting them at risk of contracting zoonotic diseases, the rituals and nonevidence-based remedies have unintendedly endangered the lives of many individuals—especially those with low health literacy. This incites the urgent need from the authorities to direct their attention and implement strategies to minimize this public health hazard before it supersedes and worsens the current COVID-19 crisis that India is faced with.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interests.

AUTHOR CONTRIBUTIONS

Mohammad Yasir Essar developed the concept for this letter. Mohammad Yasir Essar, Mohammad Mehedi Hasan, Syeda Kanza Kazmi, and Ana Carla dos Santos Costa wrote the first draft. Syeda Kanza Kazmi and Mohammad Mehedi Hasan edited the second draft and improved the manuscript. Shoaib Ahmad made the critical comments and revisions. All authors revised and approved the final draft.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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