

Critique of the Link between Swine-origin H1N1 Influenza A Virus and Dental Practice: “Unraveling the Facts”

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ABSTRACT

Although the swine influenza A (H1N1) virus mostly affects pigs, it can potentially infect people. Being in close contact with an infected person increases the risk of contracting the virus since it spreads by respiratory droplets. Dental workers must be watchful in order to stop the transmission of the H1N1 virus in the dental context, where close contact with patients is frequent. Intensification in public health awareness of influenza developed health education, prevention, and immunization. In conclusion, this in-depth analysis combines the most recent information on the relationship between the H1N1 flu and oral health. It also emphasizes the need for more investigation into the precise mechanisms of H1N1 infection in the oral cavity and the long-term dental effects of H1N1 flu.

Keywords: Awareness, Dentist, H1N1 influenza, Immunization, Preventive measures.

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INTRODUCTION

The novel swine influenza A (H1N1) is a swine-origin virus that causes influenza and is quickly spreading around the world. Approximately 180,000 instances from all over the world have been notified by the WHO as on 12 August 2009. A health crisis of international concern has also been declared by the WHO, and the pandemic warning level has been raised to stage 6 as a result of persistent transmission from person to person being detected in numerous nations.¹

The new H1N1 influenza, also known as swine flu, is a contagious illness caused by a virus called influenza. It is a pig disorder that, in extremely uncommon circumstances, can also affect humans. It is a highly contagious pulmonary condition brought on by some of the several viruses responsible for influenza A.² From person to person, this infection transmits. Human swine flu symptoms include a high temperature, throat pain, and pain in the muscles, which are comparable to influenza symptoms.³

On 11 June 2019, the World Health Assembly of the United Nations (WHO) elevated its worldwide warning signal to the most severe one, suggesting that this epidemic was in progress.³ On 13 May 2008, India announced their first incident. The majority of the cases that were later reported involved travelers from impacted nations coming to India. A total of 12,604 individuals were screened as of 20 August 2008, and 2,400 of them tested infected with swine.⁴

Dental professionals are exposed to a range of pathogens in the dental environment that can be spread by blood, mouth, or respiration. Due to the swine flu's ability to spread by aerosol, dental health workers are at substantial risk of contamination.⁵ So that infection does not spread across the dentist's operator, professionals should have a solid understanding of the symptoms, ways to spread transfer, and measures to be taken to avoid them. The virus can infect a person for up to 2–8 hours after being left on items such as hardware, surfaces, and desktops that are also a part of the dentist's operator, according to the Centers for Disease Control and Prevention.⁶ As a result, dental workers are more likely to be exposed to this dangerous infection by aerosol transmission.⁷

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THERAPEUTIC SUBSTANCE

Swine influenza A—the H1N1 virus—that causes influenza mostly affects pig populations. Swine influenza A is not often contracted by people, but this strain has developed the capacity to spread from individuals to humans and from humans to pigs. Worldwide, H1N1 infection outbreak is affecting people. Although the illness has claimed lives, the majority of instances seem to be minor. There is a chance that this outbreak might turn into a pandemic because it is doubtful that humans have an innate protection against it. There is currently no vaccination. Antiviral medications work well against the virus.⁸

PUBLIC HEALTH SURVEILLANCE

Despite the fact that the number and severity of influenza epidemics vary greatly, they occur practically every year. The influenza virus was responsible for three pandemics in the 20th century as follows: The Spanish flu of 1918, the Asian flu of 1957, and the Hong Kong flu of 1968. The epidemics varied in terms of the speed at which they propagated, the extent of the illness, and the virus that was

to blame.⁹ The H1N1 strain was responsible for the 1918 global epidemic, which has been considered to as the most catastrophic and severe of these and affected close to a third of the global population. The H2N2 strain resulted from this pressure. However, in the most effective years following its initial detection, the H3N2 variant assisted in replacing this virus. This has historically been the predominant form of influenza in mammals.¹⁰

OBSERVABLE MANIFESTATIONS OF DISEASE

Swine flu patients experience symptoms such as headaches, coughing, chills, sore throat, fever, body pain, and weariness that are comparable to those of the common human flu. Some swine flu patients have nausea and vomiting. Similar to the seasonal flu, swine flu can exacerbate preexisting medical disorders or result in serious illnesses such as pneumonia, respiratory diseases, breathing problem, and even death.⁸

ORAL EXPRESSION

- *Lesions and ulceration:* Occasional lesions or ulcers in our oral cavity might result from the H1N1 virus. These could show up behind the cheeks, on the surface of the tongue, or on the roof of the mouth.
- *Herpetic infections:* Cold sores caused by the H1N1 virus and painful blisters can occur inside the mouth or on lips.
- *Gingivitis:* People who have the H1N1 virus can have gum irritation and bleeding. Gingivitis is a condition that can be uncomfortable and painful to the mouth.¹⁰

DISSEMINATION

Typically, one or two isolated pig cases precede a major outbreak. The illness then progresses promptly within a group, mostly by straight pig-to-pig contact, fomite transfer, and aerosolization (restricted distance). Pigs around the world are susceptible to influenza, and there are signs of IAV disease, immunoglobulin, or persistent virus.¹¹

SECLUSION

There should be a dedicated separation room for each ill patient having symptoms of the influenza virus. If this is not available, then the patient should be placed in a sound-ventilated separation ward, and the distance should be 1 m from another bed in the ward. The patients who were confirmed diagnosed with the influenza virus should be placed in the same ward for the same gender.

DIAGNOSTIC TEST

- *Real-time reverse transcription polymerase chain reaction:* It is based on the categorization of hemagglutinin which is circulating presently in the body examines the actual time of polymerase chain reaction (PCR). The sample should be taken from nasopharyngeal aspiration which gives extracted RNA. The sample is amplified and identified through assay. The H1N1 organisms are more easily identified than non-H1N1 organisms because it seems highly unique assay from the swine also.¹²
- *Rapid diagnostic exam:* A test is less time-consuming and easy to perform and gives results in a short time period (20 minutes). Suppose in 65 patients, a rapid diagnostic test is done for looking up antigens and then compare with the normal RT-polymerase chain reaction so, the sensitivity of the procedure is 60–70%.

These results show that while a positive examination still suggests an examination of the H1N1 influenza, a negative outcome no lengthier excludes the similar. This test is also used for respiratory production.

PRECAUTIONARY MEASURES

Contaminant Preservation Methods

- Patients who were suffering from respiratory diseases first mentioned at check-in and they can wait in a separate closed room. If a patient has symptoms such as cold, or coughing suggest they wear disposable surgical masks.
- Dental professionals, workers should wear eye shields, facemasks, drapes, and hand gloves while examining or treating a patient having symptoms of the influenza virus by which the contamination or exposure of the virus is somehow preventable.
- Antiseptic hand wash is necessary for hand hygiene after contamination of objects and having contact with the respiratory exudate.
- Conservational controlling should be managed by proper application of disinfectant on surfaces and objects.¹³

VOLUNTARY DENTAL CARE

If a patient is ill due to the virus, advise them to communicate with their general physician and dental treatment should done later on.

Immediate Dental Services

- If a patient was diagnosed with the flu and there is a need for urgent dental treatment, then there is an airborne infection isolation room having negative pressure and 6–12 air changes every hour.
- While performing the dental treatment, disposable N95 masks should be worn by suspected cases. Occupational safety and health administration should fulfill the respirator regulation.

PROTOCOLS FOR SCREENING CENTERS

The main protocols of the screening center are as follows:

- There is a separate area for attending patients with flu by which they can avoid direct contact with the symptomless patients in the outpatient department (OPD).¹⁴
- Implementation of standards and precautions through the droplet.
- Methodize the patients.
- Collections of samples.

The screening area should have the following:

- About 50–100 patients placed in a waiting area having a surface area of 2000 sq. ft.
- Entry gate should be separate.
- Ventilated room guarantees frequent air changes.
- Overfilling of patients should be avoided.
- Separate cabins for examining the patient and collection of data.
- Sterilization and disinfection should be done properly.¹⁵

PROCEDURE FOR USE OF MASK

The techniques for wearing triple-layer surgical mask are as follows:

- Disclose the folds, mainly facing down.
- Placing it over the nasal cavity, lips, and chin.

- Bendable nose part properly placed on the nasal bridge.
- Locked with tie threads.
- No space on both the side of the mask.
- Mask should not hang on the neck.
- Preferably after 6 hours, dispose of the mask and wear a new one; one-time used masks are never reusable.
- Unknot the knotted thread below first, then the tie thread overhead, and handle the mask using the top threads to remove the disposable mask.¹⁶

DISCARD OF USED MASK

It may be disposed of by combustion or burial deep in environments where healthcare waste disposal protocol cannot be used.¹⁷

GOVERNANCE

For prevention and covering the outbreak of the H1N1 virus proper diagnosis, testing, and contamination will follow the guidelines allotted by the Government of India and which have to be followed:

Individuals who are having symptoms of swine flu should be examined by a dental professional at healthcare amenities and these are characterized by the means of the following:

- Patients having symptoms such as coughing, rising in temperature, muscle weakness, and looseness of the bowels should be treated for all these signs and symptoms; monitor and again check them in 1–2 days with professionals. This comes under category-A. No laboratory diagnosis should be required for H1N1 infection. Individuals will isolate themselves at the house only and avoid socializing with the public.
- If the symptoms are getting more severe, they require oseltamivir. Age of children below 5 years, geriatric patients, pregnant females, and patient with heart, respiratory, and renal diseases mainly no test is required. This comes under category-B.
- Additional symptoms such as pain in the chest, difficulty in breathing, and cyanosis sputum present with the blood require instantaneous hospitalization and oseltamivir treatment.¹⁷

OSELTAMIVIR

All patients with probable or verified influenza who need to be hospitalized should get treated with oseltamivir. As symptoms appear treatment with oseltamivir should be started. When antiviral therapy is initiated within 48 hours of the onset of an infection, the benefits are at their highest. The duration of antiviral therapy in H1N1 infection is suggested for 5 days but in the patient department, individuals having the worst infection may require extended course of treatment.¹⁸

OUTCOME

The majority of H1N1 infections cause mild-to-moderate sickness and do not necessitate hospitalization, so the outlook for H1N1 patients undergoing dental treatment is typically good. It is crucial to remember that the extent of H1N1 episodes can vary and that the infection has been linked to both severe sickness and death in some circumstances. It also depends upon other factors also, such as patients' general health, medical problems, and punctuality of medical interposition. A good prognosis is dependent on a prompt diagnosis, effective medical management, and supportive care.

INFLUENZA IMMUNIZATION GUIDELINES

Evidence of the seasonal influenza vaccine's ability to defend people, particularly people at greater risk for the disease, has been demonstrated throughout the years. It assists in protecting pregnant women and their unborn children for a maximum of 6 months, and for those who have received the vaccine, a decline in influenza-related hospitalization across every demographic is anticipated.

Vaccine Selection Process

The subsequent season influenza vaccine combination has been suggested by medical research (by Indian Council of Medical Research [ICMR]) for the years between 2017 and 2018. Therefore, anyone planning to receive an influenza vaccination should choose a trivalent compound vaccine containing the virus.

- A/Michigan/45/2015 H1N1pdm09.
- It should be emphasized that the ICMR guidelines align with those of the World Health Organization suggestions for the 2017–18 seasonal influenza vaccines. It is a probability for offering great efficiency besides the presently circulating type of influenza.
- Vaccination frequency is annual.
- Limitations of influenza vaccination.

When circulating and vaccine viruses are closely matched, influenza immunization is maximum effective. Effectiveness of the vaccine after suitable matching is 70–80%, which suggests that nearby circulating virus is dissimilar from the virus vaccine, which may be moderately effective or not. Therefore, vaccination should not be applied for the negative sense of safety. The formation of immunity will take 2–3 weeks after the accessibility of the vaccine.¹⁹

VACCINE H1N1 INELIGIBILITY

Hypersensitivity: In known systemic hypersensitivity responses, any constituent of Influenza A or who had a serious response to previously taking the vaccine of influenza will not be administered by monovalent vaccination.

ADMONITION AND PREVENTION ACTION

Altered Immunocompetency

An immunocompromised individual is under immunosuppressive therapy and monovalent vaccination of influenza A virus is administered then the outcome of predictable immunity response may not be gained.

Guillain–Barre Syndrome

The neurological disorder, Guillain–Barre syndrome (GBS), happened around 6 weeks after receiving of previous influenza vaccine, the result of which led to administering a monovalent vaccine that must depend upon cautious thought of possible welfare and hazards.²⁰

FUTURE DIRECTION AND COMMUNICATION

Immunization should be obligatory among healthcare employees performing by aiming progress of an H1N1 virus vaccination have only a substantial public health impression. Conventionally, low charges for immunization for healthcare workers will be given an

agreement among defendants should be mandatory for healthcare employees.²¹⁻²⁴

CONCLUSION

Regardless of the particular viral infection, a patient may have, a dentist must always follow conventional infection control procedures and measures. To stop the extension of any infectious pathogens, this involves using protective equipment (PPE), practicing correct hand sanitation, and adhering to the required disinfection and sterilization processes. Referring a patient to a doctor for additional testing and condition treatment is advised if you have any reason to believe they may have an H1N1 infection.

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