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Public Safety: Covid-19 Treatment at the Upper Respiratory Tract Phase

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Abstract: *COVID-19 is a highly contagious respiratory infection that is at a pandemic proportion. Upper respiratory tracts are primarily the reservoir from which the virus spreads down to affect the lower airway or the gastrointestinal tracts. Emphasis should therefore be placed on concerted treatment of all contacts using hypertonic saline, antihistamine, leukotriene antagonist and steroid nasal spray to reduce viral load burden in the upper airway and strengthening of the mucosal integrity*
Keywords: upper respiratory tract, viral load, steroid, antihistamine

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I. Introduction

In most resource-limited countries of the world, exposed contacts who are advised to self-isolate for two weeks at home while awaiting the result of test are without any first line treatment measure! Such individuals are likely to be accessed by the members of their family as it relates to feeding and attending to the critical needs of the quarantined individual. It becomes a grave danger if the quarantined individual eventually tests positive for COVID-19. The need therefore to place quarantined individual on first line treatment measure that will strengthen the mucosal lining of the upper respiratory tract and reduce the possible viral load which can worsen the symptoms of the patient cannot be overemphasized. Leaving quarantined patient at home without first-line of treatment is indeed a danger signal.

The corona virus is a respiratory virus like other flu-causing viruses, not new to mankind. Other flu-causing viruses are rhinovirus, adenovirus, respiratory syncytial virus, influenza virus and para influenza virus [1]. However, the virulence of COVID-19 makes it a novel pathogen.

Corona virus infection occurs when infectious droplets are inhaled through the nasal or oral routes. The virus then settles on the mucosa lining of the nose, nasopharynx, oropharynx, laryngopharynx and salivary glands [2,3].

At this stage of the infection (upper respiratory tract phase), concerted efforts must be made to depopulate the virus load and heighten the integrity of the mucosal lining in order to stem the spread of the disease either down the lower airway (in more than 70% of cases) or down the gastrointestinal tract or both.Hence, the idea of waiting till symptoms set in among contacts portends grave danger especially when the lower airways are involved [4].

Leaving quarantined patient at home without first line of treatment is indeed a danger signal; hence this proposal.

The objectives of this proposal are to:

(a) depopulate the viral load of the upper airway mucosa
(b) Strengthen of the mucosa integrity of the upper airway
(c) Reduce in community transmission among false negative contacts.

Its usefulness:

The usefulness of the proposed guidelines for the treatment of suspected COVID-19 at the respiratory tract phase are stated below:

(i) Contacts who later tested negative would have had the strengthening of their upper airway mucosa.
(ii) Contacts who later tested positive would benefit from the objectives previously highlighted.

Pharmacological agents of special interest are:

(a) Hypertonic saline[6]: It has osmotic decongesting effect on the mucosa and can destroy viral envelope, reduce inflammatory mediators and improve mucociliary function.

Hypertonic saline has the capacity to decongest the mucosa, compared to isotonic saline which only moistens the mucosa. With increasing salt concentration, decongestion becomes more and less of moistening effect. This enhances the mucosal resistance to viral, bacterial and allergy. Commercially available hypertonic saline existswhich are:hysan/saline spray. However, hypertonic saline can be produced at home or in any hospital:

Procedure for hypertonic saline production:
(i). **Children:**Add 3 levelled teaspoons of sea salt to 1 litre of clean water to make 3% hypertonic saline on shaking.
(ii) **Adults:** Add 5 levelled teaspoons of sea-salt to 1 litre of clean water to make a concentration of 5% hypertonic saline. Lower concentrations can be used or outright stoppage if a patient develops unbearable irritation which is uncommon.Sea salt is available at any big shopping centre.

(b) Antihistamine/Leukotriene receptor antagonist[7,8]: They reduce inflammatory mediators to barest minimum. It is advocated that any second-generation antihistamine that has little or no sedative side effect is preferable in order to ensure compliance.
Leukotriene receptor antagonist e.g. Montelukast can be given to provide synergistic effects with antihistamine aimed at countering inflammatory mediators. Newer combination drugs now exist for example: Montelukast 10mg + levocetrizine 5mg

Steroid[9]: It stabilizes the mucosal lining. Steroids are immunomodulators and can either be local or systemic. For optimal pharmacologic local effect with minimal systemic side effects of steroid, local formulation in form of nasal sprays is preferred.

The best timing of nasal spray is thirty minutes (30 minutes) to one hour after nasal douching with hypertonic saline. The mucosa is observed to be cleanest at this point.

Vitamin supplement: It helps in modulating innate immunity of the patient.
The above agents have proven to have profound effect on sneezing, rhinorrhea (runny nose), nasal congestion, nasal itching and itching of eyes. **All these encourage community transmission if not controlled.**

PROPOSED PROTOCOL
(a). For quarantined individual (Self isolation)
- Twice daily hypertonic saline nose douching (3% for children; 5% for adults)
- Twice daily mouth gaggling with hypertonic saline solution.
- Steroid nasal spray (2-3 puffs) 1 hour after hypertonic saline use
- Daily (Once) antihistamine – non sedating
- Vitamin supplement

(b) For symptomless positive patients
- Thrice daily hypertonic saline nose douching (3% for children; 5% for adults)
- Hypertonic saline/mouth gaggling thrice daily
- Antihistamine (Once in the morning) / Leukotriene antagonist (Once in the evening)
- Steroid spray thrice daily
- Vitamin supplement

(c) For Symptomatic positive patients
Treat as in B with other approved treatment protocol till patient is tested negative

Note: Patients who later tested negative should discontinue treatment. Treatment should only commence after specimen collection.

II. Conclusion

The adoption of the proposed treatment guidelines targeted at the upper respiratory tract for all contacts before the screening result is out or before the onset of symptoms in COVID-19 positive patients should be the ideal approach to COVID-19 treatment.

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