

# MNa Theory: Triple Therapy to COVID-19: Minocycline, N-acetylcysteine and Aspirin

Mosab Nouraldein Mohammed Hamad\*

Research Unit, Banoon Fertility Center, Sudan

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\*Corresponding author: Mosab Nouraldein Mohammed Hamad

## Abstract

COVID-19 is a universal disaster that affects the global health, economy, and restricts population movements. In this study we introduce MNa theory to treat this viral crisis using triple therapy composed from combination of that minocycline, N-acetylcysteine and Aspirin. As we haven't facilities and no confirmed cases of COVID-19 in Sudan up to date, so we send my suggestions to save my brothers and sisters in humanity worldwide, and I hope that god bless my suggestions and gain fruitful results through animal experimentation of triple combination therapy.

**Keywords:** COVID-19, Minocycline, N-acetylcysteine, Aspirin, theory.

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## INTRODUCTION

The Coronaviridae is a monogeneric family containing eleven viruses which pass on a disease to vertebrates. Components of the group are accountable for sickness of clinical and economic significance, in particular respiratory and gastrointestinal problems. The group was initially documented on the base of characteristic virion morphology, other than biological and molecular criteria applied nowadays [1]. In December 2019, numerous cases of pneumonia of unidentified etiology were reported in Wuhan, Hubei region, China, and were connected to Huanan Seafood extensive Market.

The illness which is currently named COVID-19 is caused by a novel coronavirus, labeled as SARS-CoV-2, which was revealed through whole-genome sequencing, polymerase chain reaction (PCR) and culture of bronchoalveolar lavage fluid collected from influenced patients. This virus (COVI-19), which is the seventh coronavirus that has been confirmed to infect humans, has 75–80% genomic resemblance to the severe acute respiratory syndrome coronavirus (SARS-CoV), 50% to the Middle East Respiratory syndrome coronavirus (MERS-CoV) and 96% to a bat coronavirus and employs the same cell receptor, angiotensin-converting enzyme II (ACE2), that is employed by SARS-CoV[2]. It attacks populace of all age groups. But, proof to date proposes that two groups of people are at a superior risk of getting severe COVID-19

disease. These are elder people; and those with underlying health conditions [3].

The clinical features of COVID-19 infection emerge after an incubation period of about 5.2 days. The phase from the beginning of COVID-19 symptoms to death arrayed from 6 to 41 days with a median of 14 days. The most widespread symptoms at start of COVID-19 illness are fever, cough, and fatigue, as other symptoms comprise sputum production, headache, hemoptysis, diarrhea, dyspnea, and lymphopenia. It revealed by a chest CT scan offered as pneumonia, though, there were abnormal characteristics such as RNAemia, acute respiratory distress syndrome, acute cardiac injury, and incidence of grand-glass opacities that led to death [4].

Minocycline is a semi-artificial, second-generation tetracycline analog which is successfully crossing the blood–brain barrier, useful against gram-positive and -negative infections. It is unique action mechanisms for antimicrobial behavior are relied on the features that tetracyclines suppresses protein production by acting ribosome levels, 16s RNA [5].

N-acetylcysteine (NAC) is a thiol, a mucolytic mediator and a forerunner of L-cysteine and reduced glutathione. NAC is a resource of sulfhydryl groups in cells and hunter of free radicals as it reacts with reactive oxygen species [6].

Salicylates, in the structure of willow woof, were employed as a painkiller throughout the era of Hippocrates, and their antipyretic properties have been documented for more than 200 years. Acetylsalicylic acid (aspirin), was initiated in the late 1890s and has been employed to treat a diversity of inflammatory states; but, the antiplatelet action of this mediator was not documented until approximately 70 years late. Acetylsalicylic acid exerts its effect principally by interfering with the biosynthesis of cyclic prostanoids. These prostanoids are produced by the enzymatically catalyzed oxidation of arachidonic acid, which is itself resulting from membrane phospholipids [7].

In a retrospective case sequence carried out at Presley Regional Medical Center in Memphis, Tennessee, Wood *et al.* explained their practice in treating 7 seriously ill trauma patients with late-onset ventilator-associated pneumonia (VAP) caused by *A. baumannii*, 4 of whom were treated with minocycline 100 mg intravenous every 12 hours for 10–20 days. The *A. baumannii* strains in these 4 patients were all resistant to amikacin and sulbactam. Three of the 4 strains were also resistant to imipenem, with the fourth strain showing intermediate susceptibility to imipenem. All 4 MDR strains were susceptible to tetracycline, with appropriately inferred susceptibility to minocycline. To qualify as having VAP, all patients were required to have *A. baumannii* growth of  $>10^5$  colony-forming units (CFU)/mL from bronchoalveolar lavage (BAL), in addition to fever, leukocytosis or leukopenia, macroscopically purulent sputum, and new or changing infiltrate on chest radiography.

All 4 patients with *A. baumannii* VAP treated with minocycline intravenous were deemed successes, defined as clinical improvement and absence of *A. baumannii* from follow-up BAL culture. A patient of these four patients did not experience a track-up BAL, but was assessed a success based on predefined criteria of clinical improvement and survival to hospital discharge. Two patients of the 4 patients considered successes received minocycline intravenous monotherapy, while the other two patients received combination therapy with minocycline intravenous and imipenem in 1 case and trovafloxacin and amikacin in the other [8].

Study done by Yasuhiro Kawai *et al.* showed that; minocycline can be deemed the first-choice drug for the management of *M. pneumoniae* pneumonia in children aged  $>8$  years [9]. Also another study done by CHuANqI WEI *et al.* showed that; The *S. maltophilia* isolates demonstrated susceptibility rates of 96.1 and 69.6% to minocycline and levofloxacin, respectively, according to CLSI susceptibility breakpoints [10].

Study done by ai KangYiu *et al.* showed that; on a 48-year-old woman was admitted to the intensive care unit in a Hong Kong hospital on 15 July 2009 for

original H1N1 human swine influenza (H1N1) pneumonia with septic shock and type-1 respiratory malfunction. Norepinephrine infusion and hydrocortisone were administered for septic shock. She was also given oseltamivir (75 mg, twice daily) and intravenous antibiotics (vancomycin, tazobactam plus piperacillin, clarithromycin). The subsequently day, oseltamivir dose was augmented (150 mg, twice daily) and high-dose *N*-acetylcysteine (100 mg/kg daily for 3 days) continuous intravenous infusion was started.

Following cessation of the *N*-acetylcysteine because of patient's improvement, she had relapse of fever and an escalating oxygen requirement. Tracheal aspirate remained positive for H1N1. Elevated-dose *N*-acetylcysteine was re-administered and the patient once more proved quick improvement. The virus was eradicated and she was discharged. This case exemplifies the possible role of *N*-acetylcysteine in the treatment of H1N1 influenza pneumonia in a dose employed to treat acetaminophen overdose [11].

Biofilm pattern may be concerned in a lot of infections, counting ventilator-associated pneumonia, cystic fibrosis, bronchiectasis, bronchitis, and upper respiratory airway infections. Several in vitro studies have confirmed that NAC is effective in suppressing biofilm pattern, disturbing achieved biofilms (both early and mature), and dropping bacterial viability in biofilms. There are fewer clinical research on the employment of NAC in interruption of biofilm formation, although there is some evidence that NAC alone or in combination with antibiotics can decrease the risk of exacerbations of chronic bronchitis, chronic obstructive pulmonary disease, and rhinosinusitis. But, the value of NAC in the treatment of cystic fibrosis and bronchiectasis is still matter of discuss. Most of the studies published to date have employed oral or intramuscular NAC formulations [12].

Study done by Marco Falcone showed that; The beginning data of their study suggest that, in the setting of patients with pneumonia and septic shock, a combination of low-dose aspirin (100 mg per day) in addition to a macrolide could be connected with improved survival. The advantage may be clarified by the anti-inflammatory effect displayed by these two drugs and by a reduction of acute cardiovascular events associated with aspirin therapy [13].

### Rationale

Due to its harmful impact of COVID-19 infection to the world and failure to produce vaccine to this virus up to date, we need to manage this crisis with suitable drugs supported with strong prevention measures to save our world.

### OBJECTIVES

To introduce MNA theory as suggested therapeutic method to COVID-19 infections.

Combination of Minocycline, N- acetylcysteine and Aspirin may treat people infected with COVID-19. We need to carry animal experimentation to confirm this theory.

## METHOD

Administration of the drugs mentioned below to mice infected with COVID-19:

- Minocycline 100 mg intravenous every 12 hours for 14 days
- Orally administered N-acetylcysteine (100 mg/kg daily for 3 days).
- Aspirin (100 mg/day) for 14 days.
- After 2 weeks the outcome of the triple therapy will be seen.

## RESULTS

MNA theory needs animal experimentation to confirm.

## CONCLUSION AND RECOMMENDATIONS

I suggest that this triple therapy will cure many patients with COVID-19, and I recommended carrying out animal experiment model as soon as possible.

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