



# Coronavirus [COVID-19] and IgA Deficiency: Mini Review Article

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## ABSTRACT

### Keywords:

COVID 19, WHO, Death,  
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Spread of COVID-19 in all of the world caused the warning alert from WHO. It began from China and was the reason of many death through the world since 2019 December. Elders and people with previous diseases such as IgA deficiency [IgAD] are more susceptible to get COVID family. Also, higher level of IgA can combat with infectious disease.

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## Introduction

A novel coronavirus (COVID-19) is an acute respiratory syndrome that initiated from china in December 2019 [1]. It made an emergency global concern when it is spread through the world and almost 28 countries were affected until February 2020 [2]. COVID-19 infected over 80,000 people in China until March 2020 and 3300 confirmed death due to COVID-19 [3,4]. The global death due to COVID-19 virus exceeds 21000 until April 2020 [5]. The first thing that we consider is the role of immunoglobulins in the human immune system. Immunoglobulin A (IgA), is the second prevalent antibody in human serum, has an essential role in body as a protective layer against bacteria and viruses [6]. It is an ample antibody in mammalian group due to mucosal secretion [7]. In the other words, releasing IgA into both the mucosal surface and blood circulation, is the immune

system responds to infections [8]. IgA is divided into two subclasses, IgA1 and IgA2 which are produced by separate genes [9]. About 90% of the IgA in serum is monomeric IgA1 that produced in the bone marrow, whereas the majority of external secretory IgA is polymeric with increasing the level of IgA2 [7,10].

### **IgA Deficiency**

Antibody deficiency is defined as the disability of humoral immune system to provide adequate antibodies [11]. The deficiency of IgA (IgAD) is due to variations in controlling genes to production of IgA. IgA deficiency is more common in specific Caucasian groups, whereas not common in some Asian groups [7]. The most common phenomenon in IgA deficient persons, is Recurrent Infections in respiratory system [9]. The incidence rate of IgAD is various in each population. In Australia, USA, and Sweden the rate of IgAD is 7.1%, 13.3% and 1.7% respectively [12,13]. In Finland, is 0.25% and in Spain, Nigeria, England, and Brazil the incidence rate is 0.61%, 0.39%, 0.11% and 0.1% respectively [9,14,15]. In Arabian peninsula and Caucasians the incidence rate of IgAD is 0.7%, [16,17] which may show the effects of geography and race. The prevalence of IgAD in Iran is 0.33-0.15% [14,18]. Many reports show that chronic lung disease such as bronchiectasis, occur in IgA deficient people. Apart from that, other infectious disease such as gastrointestinal infections and *Giardia lamblia*; which infect intestinal epithelium, are frequent in people with IgAD [19]. Also, a strong antiviral activity against influenza viruses, have confirmed in heterosubtypic IgA [6]. An investigation in mice in 2001, found that IgAD can increase the risk of influenza A virus affecting [20].

### **The Important Role of IgA**

IgA can prevent the spread of the virus, but after the beginning of the disease, the level of IgA decreased [21,22]. On the one hand, The Concentration of mucus IgA is higher than the mucus IgG in tracheal and bronchial mucus which may work on the surface and protect against infection of the PR8 virus. On the other hand, nasal and tracheal mucosa can supply IgA and are protection barriers against fatal infection of PR8 virus [23]. Also anti-influenza-A antibodies in donor breast milk show the reduction of the risk of influenza virus infection [24]. Unfortunately, the level of IgA decreased due to infections and inactivated influenza virus vaccines do not have efficiency on mucosal IgA responses [25]. So the study of molecular characteristics and the role of IgA in mucosal vaccines against influenza virus infection is crucial [26]. Infections and bronchiectasis in patients with IgA deficiency and defects in the immune system occur more higher than others. At the same time, people with allergy and autoimmune disease; as well as infected patients, should be evaluated in terms of serum IgA [11]. N-linked glycosylation of IgA secretory part, have competition for receptor with *Helicobacter pylori* and bind to *Escherichia coli*, toxin A from *Clostridium difficile* and *Streptococcus pneumoniae*. Secretory IgA (sIgAs) have sialic acids which inhibit the attachment of S-fimbriated *Escherichia coli* [6,27-30]. So, it is important to notice that people with IgA deficiency can be in danger of COVID family more than others.

### **Opinion**

Due to the body's immune system which plays an important role in the infection of severity of viruses; including coronavirus, people with weaker immune systems including those with IgA deficiencies, are at higher risk for pathogens and viruses, so it is recommended that the general public, especially the medical staff, to check the blood IgA level to take more care of themselves and strengthen their immune system if they are deficient.

## Conflict of interest

None

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