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LETTER TO THE EDITOR

Regarding the Article: Coronavirus Disease (COVID-19): Current Status and Prospects for Drug and Vaccine Development

We have read with great interest the article by Ita K (1). There are several concerns related to COVID-19 vaccine discovery and development. In this article we will discuss about them.

Effective and stable keeping vaccines mean requiring them at cold temperatures and transfer them rapidly from the manufacture to the health centers. It has been documented that about 2.8 million vaccines were lost in 5 countries because of cold chain failures, and below 10% of countries met WHO guideline for efficient vaccine management. About 80% of vaccine costs are related to the cold chain, hence the WHO recommendation is necessary during storage and transportation. Lyophilized vaccines have better stability in comparison to liquid product. The lyophilized product can injection after reconstitution or used directly as an aerosol inhalation. Correct reconstitution of lyophilized vaccines is critical, and powder should not be reconstituted until the injection. Liquid vaccines lose potency when stored at freezing temperatures, because slow freezing makes great stress to the colloids and lead to irreversible aggregations (2). Liquid vaccine needs refrigeration, which can be challenging for use in low-income countries. The world will need to inject billions of Covid-19 vaccines, consequently safe injections, and prevention of needle-stick injuries in health workers is necessary. Furthermore, another issue the waste management and environmental pollution. The route of COVID-19 vaccine administration may be affecting the quality and extent of immune responses that are independent of the administered dosage. Since COVID-19 is mainly a lung disease, founding a mucosal immune response is vital, showing that mucosal COVID-19 vaccination (e.g., pulmonary, intranasal, oral) may be superior to parenteral form (2).

There is a worry that vaccine, as with natural COVID-19 infection, may not induce long-lasting immune response and reinfection may be happened. It has been reported that natural immunity to coronaviruses that lead the slight or mild infection may last for only a few months after disease. The subjects that receive the first COVID-19 vaccines probably will have weakening immunity and need boosting by administration of second round vaccines. Moreover, some persons who have recovered from coronavirus infection who showed poor or waning immunity may also need vaccination (3). Another ambiguous matter is the period

of the immunity induced by vaccine. There is unresolved issue that natural COVID-19 infection in some person induces only low neutralizing antibody levels in the body and those levels in some vaccine may reduce relatively rapidly.

Most of the recent analysis documented that the COVID-19 vaccine was convincingly effective in that small sample size and healthy subjects. When using healthy and young and population, it is unknown whether the finding can be generalized to an elderly and subjects with co-morbidity. Hence, various vaccine types will maybe be required for children, elderly individuals, pregnant women, and immunocompromised patients (3). Moreover, a dosing strategy should be if leads predictable disease with nominal severity.

Another concern is related to side effect and quality control COVID-19 vaccine. Health workers should constantly monitor side effects of COVID-19 vaccines in individuals. Finally, billions of subjects in middle-income and poor countries may not be received COVID-19 vaccine; consequently, equitable COVID-19 vaccines distribution is necessary.

References

1. Ita K. Coronavirus Disease (COVID-19): Current Status and Prospects for Drug and Vaccine Development. *Arch Med Res*, 2020, 2020.
2. Wang J, Peng Y, Xu H, et al. The COVID-19 vaccine race: challenges and opportunities in vaccine formulation. *AAPS PharmSciTech* 2020; 21:1–12.
3. Jeyanathan M, Afkhami S, Smaili F, et al. Immunological considerations for COVID-19 vaccine strategies. *Nat Rev Immunol* 2020;20: 615–632.

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