

## Medical and ethical issues related to COVID-19 vaccine

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The current COVID-19 vaccine research and development raises many medical and ethical questions which have to be addressed by all stakeholders. No doubt, it is the need of the day to overcome the pandemic, but the importance of research ethics has to be maintained. The safety and well-being of research subjects must be protected, especially that of the vulnerable group. The approval of the Ethics committee before implementing the research and consent of the population is mandatory.

The world is eagerly waiting for a COVID-19 vaccine. But the initial supply of the vaccine is unlikely to meet the demand. Many ethical and medical issues have first to be resolved, with the initial question being, which are the priority groups for early vaccination?

The new COVID 19 vaccine can raise two questions: whether it can change the human DNA as it may contain foetal cells residues due to inadequate purification?<sup>1-3</sup>

Both the answers are available. The human DNA is the library of the whole genetic system and cannot be controlled by any external protein as mRNA of the virus or vaccine. The human DNA makes its own mRNA to develop proteins which send messages to ribosomes which then make suitable proteins for the body. The cell cycle of the body is controlled by the DNA. Any new change leads to cell transcription and cell translation through ribosomes, a process in which ribosomes in the cytoplasm or endoplasmic reticulum synthesize proteins in the nucleus of the cell. If a virus or foreign protein enters the DNA it will first be checked. If it needs repair, it is done by the DNA repair system. If not repaired, the DNA kills the cell through apoptosis or it dies on its own or becomes cancerous. So an outside mRNA will be suppressed by the cell DNA.

### What is the vaccine's genetically engineered "mRNA"?

The vaccine, a positive sense mRNA, and after entering the human cytoplasm heads for the ribosomes and not the nucleus. There is no integration or insertion in the

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human DNA nor does it disturb the translation system. The "Viral vector DNA vaccine" carries a message of mRNA to human DNA to ribosomes for making spike proteins. These spike proteins are recognized by the innate immune system which leads to the formation of TH1 and TH2 cells. This further instructs the adaptive immune system to make NAB (Natural Antibodies) against SARS-CoV-2. This action activates the B Cells, cytotoxic T cells and natural killer cells along with their memory cells which continue to work life long.

### What are the ethical issues of the vaccine?

Does the vaccine contain fragments of human cells? If so, is it against ethics, and if the purification is not correct, it becomes questionable. These issues should be addressed by vaccine manufacturing the companies to their stakeholders for following the proper protocol

### Why is this objection being raised?

COVID-19 vaccines are being developed, and tested on human cell lines, such as HEK93 and MCR-5 cells. These cells have been developed in the laboratory many decades ago. Can these cells, cultivated in the laboratory in 1966 and 1970 from an aborted foetus with many generations gone by, be called human cells or not?

"Moral complicity" is the thought that utilizing the results of an unscrupulous demonstration, as some observe it as premature birth, makes one complicit to the underlying demonstration. Moral complicity was a significant worry in past ages when execution rates appeared to increment when "supported" by the utilization of casualties' bodies "for science."

Does the utilization of premature birth inferred antibodies make vaccinators and immunization beneficiaries complicit with and "liable of" the underlying foetus removal? A comparable issue was raised when the mainstream press understood that specialists were profiting by examinees including HeLa cell lines that had been utilized without the patient's assent. The greater part of scientists do not consider this to be complicity contention as an impediment to the utilization of explicit immunizations anything else than we see a kidney relocate the beneficiary getting an organ from an expired homicide casualty as being complicit with or

blameworthy of the homicide of the organ contributor.<sup>4</sup>

Secondly, when a viral vector or RNA vaccine is planted in these cells then after harvesting, these cells are killed and the vaccine is made.<sup>4,5</sup>

### COVID-19 Vaccine and its Medical Issues

These foetal cells are external antigens and will be recognized through antigen presenting cells. MCH-1 and MCH-2 will activate T cells and B-cells through naive CD4-cells. When introduced in the body, T-cells and B cells can trigger immune conflict and cause a reaction. This is similar to transfusing non-compatible blood causing a reaction or the recipient of a kidney or bone marrow taking immunosuppressive drugs lifelong to prevent rejection. This threat has to be overcome by strict purification of the vaccine. No adverse effect has been observed till the Phase 111 of the trial.

### Recommendation

The innovation of a safe, fruitful and generally accessible Vaccine against the SARS-Cov-2 will be an extraordinary hope looking forward for mankind for protection against the current pandemic, which has gripped about 280 countries. Many issues still remain to be addressed:

1. Without understanding the pathogenesis of COVID-19 and the predictive value of different vaccines in the clinical pathway of infected individuals by SARS-CoV-2, can cause loss of time, money and credibility.

2. Without understanding the SARS-Cov-2 virus nature and the immunogenic epitopes and antigens of this virus, may lead to a wider spread of the pandemic, rather than to control it. This can be due to chances of mutations in any structural and non-structural genes of the coronavirus.

3. Use of aborted cells may open an industry which can raise the legal and illegal abortion setup for earning money, so adult cells should be used through developing the stem cell technology.

4. The current understanding for making the vaccine through neutralizing antibodies will necessitate the finding of the antibody dependent immunity. This can contribute to more spread of COVID-19.

5. The use of cell line rather than animals for making the vaccine against SARS-CoV-2 may challenge testing, which raises the speculation of using controlled human infection (CHI) as a potential approach.

6. Unknown reactions can appear due to using this vaccine in a hurry through negligence in purification of cell lines harvesting techniques. So the data must be preserved after strict surveillance post-vaccination. The vaccine manufacturing companies must compensate if there is any adverse reaction or death.

7. How long will the antibodies remain potent, what will be the role of the memory cells and the duration of protection by the immune system after natural infection, remains questionable.

8. The stakeholders must address all these ethical and medical issues addressed in this article before using the COVID-19 vaccine.

### References

1. Wang EA, Zenilman J, Brinkley-Rubinstein L. Ethical considerations for COVID-19 vaccine trials in correctional facilities. *JAMA* 2020; 324:1031-103
2. Bukhari MH. The current COVID19 (SARS-2 COV-19) pandemic: A lesson for all. *J Pak Med Assoc.* 2020; 70:1115-1116. PMID: 32799257.
3. Bukhari MH, Mahmood K, Zahra SA. Over view for the truth of COVID -19 pandemic: A guide for the Pathologists, Health care workers and community'. *Pak J Med Sci.* 2020; 36(COVID19-S4): S111-S114. doi: 10.12669/pjms.36. COVID19-S4.2519. PMID: 32582326; PMCID: PMC7306957.
4. Wadman M. Abortion opponents protest COVID-19 vaccines' use of fetal cells. *Science*. Cited on June 5, 2020. Available from URL: <https://www.sciencemag.org/news/2020/06/abortion-opponents-protest-covid-19-vaccines-use-fetal-cells>.
5. Cheshire WP. Turning a blind eye: An ethical assessment. *Ethics Med* 2011; 27:7-15.