

CoV-/N-SIGHTS: Evidence-Based Answers to FAQs Director General Medical Services (Navy)



FAQ # 10 (24 May 2021): USE OF 2 DEOXY-D-GLUCOSE IN COVID-19 TREATMENT

1. **What is 2-Deoxy-D-Glucose (2-DG) and how does it work?**

2-Deoxy-D-Glucose has traditionally been used in cancer treatment as an adjunct and published reports of its limited efficacy in treating patients in non-hospital settings are available. It competes with glucose and inhibits glycolysis (process by which cells break down glucose for release of energy) in cells. Hence, cells with higher glucose consumption like cancer cell have also a higher uptake 2-DG resulting in diminished growth of these cancer cells.

2. **In that case, would the drug '2-DG' work in COVID-19?**

As glucose is also required in higher quantities by the cells in which SARS-CoV-2 has invaded for replication, these cells also have a higher uptake 2-DG. Deprivation of energy in these cells and disrupting cell functioning is deemed to reduce the viral replication, thereby reducing the viral load. All this said, the drug ideally needs to be tested in large scale phase III clinical trials with scientific rigour, and the methods of study/ results also need to be peer reviewed (reviewed by the scientific community).

3. **Has any new clinical evidence been generated for use of '2-DG' in COVID-19?**

According to 08 May 21 release by Ministry of Defence, the drug was tested on 110 patients in Phase II trails (to find the side-effects/safety of the drug) in moderately ill patients of COVID-19. The Phase III trials (to find the efficacy of the drug) was conducted on 220 patients between Nov 20 to Mar 21 at 27 COVID hospitals across India. The study subjects were chosen so as to exclude Diabetics, person with Coronary Artery Diseases, Chronic Obstructive Lung Diseases, Chronic Kidney diseases. Hence, the trial results do not apply to COVID patients with co-morbidities. The results of the trial indicated early relief from oxygen therapy/ dependence with 42% patients who received 2-DG showing symptomatic improvement by third day as compared to 31% of those who received standard of care. **However, the details of the study including the study protocol has not been made public till now, hence, scientific scrutiny of the same is not possible presently.** Institute of Nuclear Medicine and Allied Sciences (INMAS), which is a Defence Research and Development Organisation (DRDO) institute has stated that the drug was not evaluated in the acute treatment of moderate to severe COVID-19.

4. **Is there any published clinical evidence/ data to prove effectiveness of '2-DG' in treatment of COVID-19?**

One scientific study done in Mar 20 by a team from Patanjali Research Institute, Haridwar and Saveetha Institute of Medical and Technical Sciences, Chennai is the only available scientific evidence presently available in public domain on efficacy of '2-DG' in treatment of COVID-19. It is a non-peer reviewed paper and available in pre-print form on ResearchGate platform. Hence, the experts are pointing out the paucity of data and ambiguity of study protocol.

5. **Has 2-DG been launched for treatment of COVID-19 in India?**

The drug '2-DG' has been cleared for **Emergency Use Authorisation (EUA)/ Off Label Use** in India by the Drug Controller General of India as on 01 May 21. It is being developed as a joint venture by INMAS, DRDO and Dr Reddy's Laboratories (DRL). Due to the novelty of 2-DG in non-surgical treatment of cancer, INMAS had transferred the technology for this molecule to DRL in 2014. The drug has not been launched in market as of yet.

6. **Is '2-DG' a safe drug? Does it have side-effects?**

Hypoglycemia and sedation are known side effects of 2-DG. At higher doses cardiac effects like prolongation of QT interval (ECG abnormality) and certain neurological effects are documented.

7. **What is the dosage schedule of '2-DG'?**

Not much is known now. However as per initial information, the drug is to be taken orally mixed in water. It has a two dose schedule with one sachet given after overnight fast in morning and the second sachet in after three hours of fast. The proposed dosage schedule is for 05-07 days.

8. **Is consent of patient required before administering 2-DG?**

Informed consent may be required, as the drug is still under EUA, and no published data is available. However, guidelines regarding prescription/ consumption of the medicine are awaited.

References.

1. 2-Deoxy-d-Glucose and its analogs. ResearchGate. Available at <https://www.researchgate.net>
2. Press Release, GoI. DGCI approves anti-COVID drug developed by DRDO for emergency use. 08 May 21. Available at <https://pib.gov.in>

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