Is Oxygen the Answer to Long Covid?

Treatment options for lasting Covid symptoms are limited, but initial studies suggest hyperbaric oxygen could help.

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She was dead tired but couldn’t sleep, couldn’t think straight, and could barely walk. The muscle pain in her arms and legs was so bad that she spent days in bed. When she did get up, she used a wheelchair. And she couldn’t focus on even the most trivial tasks, let alone work. But doctors couldn’t agree on what was wrong with 41-year-old Maya Doari.

The sac-like tissues surrounding her heart were inflamed, of that they were sure, so she was diagnosed with pericarditis. But when her left hand turned blue—on and off for months—her physicians told her “don’t try to understand,” because they no longer could.

Neither could a vocal cord specialist, who mocked her when she tried to speak, hardly able to muster a soft whisper. And when she attempted physical therapy to relearn how to walk, she experienced seizures. “I asked, ‘Don’t you think it could be connected to the Covid I had?’ They said no and sent me home, saying it’s psychological.”

But her condition was real. And it may not be as unique as it sounds.

Three months earlier, Doari—a homeopath who lives in a small village near Jerusalem—had come down with a 24-hour fever and strong bone pain. It was Covid. But after these initial symptoms passed, days later the real symptoms began. “My doctors said my case was the worst long Covid they had ever seen.”

Covid can have many lingering effects, and for now at least, long Covid is the catch-all phrase used to describe them. Over 200 symptoms have been gathered under this umbrella term, ranging from the common—tiredness, fever, and “brain fog,” or difficulty thinking—to the more striking, like Doari’s seizures and speech problems. The exact prevalence of long Covid is debated, but millions around the world have reported having lasting symptoms.

Yet today, a year after her long Covid symptoms arrived, Doari says they are “98 percent gone,” a turnaround tied to new research that may have uncovered a promising long-Covid treatment.

It’s called hyperbaric oxygen therapy, and in July Israeli researchers published a study—which Doari participated in—that showed using this technique to deliver massive amounts of oxygen to the body appears to alleviate many of Covid’s cognitive and physical after-effects.

Hyperbaric oxygen therapy has been around for decades and typically entails getting into a hard-shell, pressurized tube where the air pressure is up to three times that of our atmosphere, and then breathing in concentrated oxygen. Originally intended to treat the bends, a dangerous condition that can result from deep-sea diving or high-altitude mountaineering, it's now used to promote healing in cancer patients and burn victims and is even used by athletes eager for a performance boost or people looking to remove plastic surgery scars.

Breathing in concentrated oxygen under pressure raises the amount of it that dissolves in the blood, meaning that more oxygen gets delivered throughout the body's tissues. This can then boost the power of the immune system and stimulate the release of stem cells and substances called growth factors, which help tissues heal.

The Israeli trial entailed 40 daily sessions—five sessions a week for two months—with long-Covid patients donning oxygen masks and breathing 100 percent oxygen at twice the atmospheric pressure exerted at sea level for 90 minutes, with five-minute breaks every 20 minutes.

Or at least, this is what half the participants did. The other half experienced a sham procedure that exactly resembled this—getting in the chamber, putting on the mask, and so on—but didn't actually get the treatment. The study was double-blinded, meaning neither the participants nor the researchers involved knew who was getting the real thing.

The results suggested a clear effect. Compared to those in the placebo group, individuals receiving the treatment reported improved energy levels, sleep, and cognitive function, and decreased depression. Likewise, the extent to which pain interfered with their life dropped. "It felt like I was suffocating," recalls Rafi Akav, a 44-year-old marketing manager who volunteered for the study. He now says his sleep, mental focus, and energy have all returned. "That treatment saved me."

These findings build on those that have come before. In November 2020, British researchers published the first evaluation of hyperbaric oxygen therapy for long Covid, which suggested people's symptoms could improve in just 10 sessions (that British study included only 10 patients but showed improvements in fatigue and cognitive function; the Israeli study was bigger, though still small, featuring 73 patients across its treatment and control groups).

The reason for the therapy's effects is more complex than some people think, suggests Shai Efrati, a professor at the Sackler School of Medicine at Tel Aviv University and founder of the Sagol Center for Hyperbaric Medicine and Research, the world's largest hyperbaric treatment facility.

According to his earlier research, the therapy isn't just effective because it floods tissues with lots of oxygen. Inhaling massive amounts of oxygen and then breathing normal amounts afterward also fools the body into thinking it's being deprived of oxygen—a phenomenon known as the hyperoxic-hypoxic paradox. When we *think* we're being oxygen-starved, a metabolic change occurs—designed to counter the damage generated when oxygen is deprived. The response triggers a regenerative cascade of events, but without the harmful side effects of real deprivation.

"We trick the body," says Efrati. "It's not magic, it's a repair mechanism. And it doesn't happen in one day. It takes five days a week to make it last," he says.

Exactly how long improvements in long Covid patients last hasn't been confirmed; the study followed up with participants for three weeks. But in previous hyperbaric studies—in which Efrati found the therapy could regrow telomeres (parts of people's chromosomes that shorten with age) and improve cognition in adults aged 64 and over—he says the results held for more than two years. (Efrati is 52 but claims his cellular age is closer to 30 after having undergone hyperbaric therapy for roughly 15 years.)

But while Efrati and his colleagues have shown that long-Covid symptoms appear to improve with the therapy, a lot of questions remain. With its 73 participants, Efrati's study is limited—more research is needed to see how widely effective the therapy could be across different groups.

Then there's the variety of long Covid. Depending who you ask, there seem to be as many definitions of the condition as there are symptoms associated with it, a problem in itself, say researchers. The mechanisms behind these symptoms are still being figured out, so whether all of them can be influenced by hyperbarics is unknown, as exactly what the therapy is resolving in patients hasn't yet been confirmed. Efrati hypothesizes it could be tissue damage in the brain.

And even if hyperbaric oxygen therapy is broadly effective, will the treatment scale to become widely available, and will people be able to afford it? Efrati's form of the therapy—which involves sitting up in a pressurized room rather than lying down in a chamber—is limited to a handful of clinics in Israel, Dubai, and Florida and costs tens of thousands of dollars.

Efrati acknowledges the price barrier but attributes it to the stage of the innovation, comparing oxygen therapy to cell phones: "In the beginning, they were expensive and huge, and now it's cheap and everyone has one. Why? Because it works, and the same thing will happen here."

Others aren't yet convinced. "It's a very small study, and the results aren't stellar, so it could be a false-positive finding," says Frances Williams, a professor of genomic epidemiology at King's College London who specializes in studying chronic pain syndromes. "There have been multiple studies of hyperbaric oxygen for all sorts of diseases—like venous ulcer and stroke—but overall it has not really had overwhelmingly positive results in any of them. So I remain rather skeptical."

While the study was small, meaning its results shouldn’t yet be used as evidence to support broad use of hyperbaric therapy for long Covid, it was a double-blind randomized controlled trial—the gold standard for testing medical interventions. The fact that the therapy showed promise under these conditions suggests it should be investigated further, particularly as there’s so little else available to treat Covid’s lasting symptoms. “Long Covid is very troublesome, so it’s worth trying hyperbaric oxygen,” says Williams. “And there are pathological reasons why it might be helpful.”

Efrati has no doubt that the treatment’s helpfulness will be proven in time and the therapy will gain widespread acceptance as a long-Covid treatment. “We have more papers coming, and thousands of people on our waiting list,” he says. “My job is to show the research works.”