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Hyperbaric oxygen therapy: medical hope or hot air?

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Some parents of children with cerebral palsy and other forms of brain damage say a treatment long used by doctors for other conditions has brought what seem like near-miraculous advances in kids who hadn't been able to talk, walk or feed themselves.

The treatment -- hyperbaric oxygen therapy, or HBOT -- delivers pure oxygen at higher-than-normal pressures to patients sitting or lying in a chamber. Although there is no proof, advocates believe that in brain damage cases the extra oxygen can prompt dormant or damaged neurons to become reinvigorated.

Hyperbaric oxygen therapy has long been used in mainstream medicine to treat a dozen very specific problems, such as stubborn wounds, but its use in neurological conditions is highly controversial.

In the past few years, parent activism has spawned a nationwide movement to get research and recognition for the use of the therapy for their disabled children. And the mainstream medical community -- though skeptical -- is starting to funnel some money and effort into the question.

"As of now, there is no scientific evidence in support of the use of hyperbaric oxygen therapy for cerebral palsy, but on the other hand, there are still enough questions here that we are reluctant to say this is just foolishness," said Dr. Murray Goldstein, medical director of the United Cerebral Palsy Research and Education Foundation.

The organization expects soon to announce a \$300,000 study into the treatment, which involves multiple sessions in a chamber over the course of weeks or months.

QUESTIONABLE PAST

At the same time, hyperbaric oxygen therapy also has a long history of being championed by quacks who promise it will do everything from restore hair color to cure cancer, and some worry that desperate parents are spending money and time on a fruitless search for a miracle.

One of the most vocal proponents of the therapy is Julie Gordon of Green Bay, Wis. She

said her 25-year-old daughter, who was brain-damaged at birth, functioned at the level of a toddler, was very spastic and lived in her own autistic world before receiving hyperbaric oxygen therapy.

"After 22 treatments, I noticed a reduction in the spasticity, and now she can stand with very little assistance and her autistic behaviors have subsided," Gordon said. "She now wants to know who will come to her funeral when she dies. She is at such a level of intelligence that I'm amazed.

"I have personally seen two children stop seizing," she said. "I saw a boy's (crossed) eyes straighten in one treatment. I saw a 5-year-old walk for the first time."

Gordon now runs a clearinghouse of information on the therapy for children. And parents frustrated by the lack of interest by traditional medicine have formed the International Hyperbaric Medical Association, which has sponsored two symposiums on the therapy and brain injury in children. They believe that the many reports of benefit prove it works.

"People have been sentenced to death on less information than we have" about hyperbarics and brain injury, said Ken Locklear, who heads up the International Hyperbaric Medical Association and is editor of the magazine *Hyperbaric Medicine Today*.

INSURANCE BATTLE

Some parents have won court cases against insurance companies or state Medicaid programs to get the treatments covered. In Texas, hyperbaric activists helped enact a new law that they hoped would lead to insurance coverage for hyperbaric oxygen therapy in children. A bill in the California Legislature to require Medi-Cal reimbursement for hyperbarics is on hold.

An Oklahoma congressman whose aide's son reportedly improved after the therapy has helped push the agenda on a federal level, getting a nonbinding statement in support of the therapy included in last year's appropriations bill for the National Institutes of Health. And last year's Food and Drug Administration regulatory changes made it easier for chamber operators to treat a wider range of conditions.

At the same time, a growing number of stand-alone hyperbaric centers have sprung up nationwide to meet the demand, which has created some concern in the mainstream hyperbaric medical community. The therapy is generally considered safe, but pure oxygen can pose a hazard, including the rare risk of seizure.

"We're concerned about the cottage industry" that has sprung up, said Donald Chandler, executive director of the Undersea and Hyperbaric Medicine Society, which represents doctors trained in the use of the therapy. "Some people look on it from the standpoint of money -- they can make money by treating people in their garage. It has the potential to do a lot of damage."

LONG-TERM COMMITMENT

Sessions typically last an hour and cost parents \$100 to \$200 per hour, often with discounts for multiple sessions. Usually, parents are told they need at least 20 sessions, often up to 100, to see results.

One reason so many centers are cropping up -- more than 500 nationwide -- is that many mainstream hyperbaric doctors turn away patients with brain injuries.

"We get calls from people who have cancer, people who have HIV, arthritis --

all kinds of things," said Dr. Neil Hampson, director of the hyperbaric medicine program at Virginia Mason Medical Center in Seattle and president of the Undersea and Hyperbaric Medical Society. "And we don't treat those patients either without published, scientific evidence" that it works.

Hyperbaric oxygen therapy has been around for many years. In the 1930s, doctors learned it could treat decompression sickness in divers ("the bends"), and since then, the recognized applications have expanded to the treatment of many types of nonhealing wounds, carbon monoxide poisoning and intercranial abscesses. As of April 1, Medicare will cover the therapy for stubborn sores that often afflict diabetics' feet.

But hyperbaric oxygen therapy also has a long history of being oversold. In the 1920s, a doctor who claimed it could cure hypertension, diabetes, syphilis and cancer built a six-story hyperbaric chamber in Cleveland where patients stayed for days or weeks at a time. By 1930, it was clear the treatment had no benefit, and the clinic was demolished and sold for scrap metal.

LITTLE MEDICAL PROOF

The legacy of hype remains one of hyperbaric oxygen therapy's biggest obstacles. Even today, many of the most vocal proponents easily slide into sweeping statements about the therapy that are far from proven.

"This treatment, applied appropriately to patients who need it -- from people in battered women's shelters to people who've been beaten up in gang initiations to people with strokes or in drug treatment programs -- would literally revolutionize neurological medicine and massively decrease the costs to society in both education and health care," said Bill Duncan, an aide to Rep. Ernest Istook, R-Okla., who has been promoting the therapy in Congress. Duncan said his brain-damaged son improved dramatically after treatments.

But reports of benefit remain largely anecdotal, and experts in hyperbaric medicine say they are still waiting for proof.

"The issue with us is that there is not enough scientific evidence yet for us to get on board with this," said Chandler of the Undersea and Hyperbaric Medicine Society. "We know

there are a lot of people who have facilities out there and who are treating it, and from what we have heard, there are some good reports and some bad reports. If we just had the evidence, we'd be happy to support it. But it just isn't there."

STUDY SHOWED BENEFITS

The largest and most cited research to date involved children with cerebral palsy in Canada. That study found no difference between the group treated with oxygen and the placebo group that received pressurized air to simulate the sensation.

Still, both groups did show some improvement, and hyperbaric oxygen therapy proponents say that proves that even providing ordinary air at high pressure can have beneficial effects.

Getting money to undertake rigorous clinical studies is difficult because hyperbaric oxygen therapy cannot be patented, like a new drug.

Goldstein of the cerebral palsy foundation said that what is known about brain injury doesn't support the notion that hyperbaric oxygen therapy could be helpful, and that has made it difficult to find respected scientists willing to do the research.

"Our problem, quite frankly, is there is so little belief in it as a hypothesis that it's hard to get busy, highly skilled people to devote time and energy to it," he said.

Still, the foundation is committed to trying to get more answers, starting with funding a study using PET (positron emission tomography) scans of children with cerebral palsy before and after hyperbaric oxygen therapy.

"We're bending over backwards to be open-minded about this," Goldstein said.

"Look, these families and these physicians are reporting what I consider rather miraculous kinds of results. So let's take a very hard look, because if they're right, it would be tremendous."

RESEARCH IN THE WORKS

At the same time, the federal Agency for Healthcare Research and Quality has commissioned a report surveying the state of the evidence about hyperbaric oxygen therapy and brain injury, which is expected to be released this year. Congress also earmarked \$1.1 million for a study of the therapy and cerebral palsy at Wright-Patterson Air Force Base in Dayton, Ohio, which will begin after gaining military approval.

Like many parents of disabled children, Karen So of San Francisco first heard about hyperbaric oxygen therapy through word of mouth. Another mother told her that her brain-injured daughter began talking after receiving the pressurized oxygen treatments.

At the time, So's 7-year-old daughter, Michelle, couldn't talk, eat or walk on her own.

After 40 hourlong sessions at Bay Area Hyperbarics in Mountain View, So said Michelle was able to lift a spoon and take her first steps.

"It's messy, but at least she's self-feeding," So said. She chalks up the improvement to the treatments, although 60 more sessions in the chamber since then haven't brought any significant additional advances.

Still, So said she continues with the therapy because she believes it helps her daughter stay more alert.

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Cheryl Bryant Bruce of Belmont and her 9-year-old son, Gregory, are placed in a hyperbaric chamber with the help of Dr. Lane Scott (left) and Patty and Wally Weible of Foster City. Gregory has brain damage and is receiving increased levels of oxygen and atmospheric pressure from Lane, director of HyperbariCare. The Weibles are friends of his mother's and own the hyperbaric chamber. Chronicle photo by Michael Maloney



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Gregory and Cheryl Bryant Bruce sit inside the chamber in their Belmont home. They received a two-hour treatment. Chronicle photo by Michael Maloney



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Michelle So, 7, took her first steps after 40 hyperbaric sessions, her mother says. Chronicle photo by Gina Gayle



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