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The results of the Epilepsia poll on the use of medical marijuana (MMJ) and cannabidiol (CBD) reveal a striking difference in the assessment of the safety and efficacy between epileptologists and patients. In our review, we highlighted the limited evidence supporting MMJ and CBD to treat epilepsy and acknowledged the encouraging preclinical evidence and calling for rigorous research, a view echoed by our colleagues who responded to the Epilepsia survey. However, the enthusiastic acceptance of the efficacy and safety of MMJ and CBD by patients and advocates reminds us that science is a religion held by a small minority. The convenient science creates new technologies and knowledge that does not conflict with our intuition and beliefs, and is readily embraced by society. True science is inconvenient, as it forbids the conversion of powerful beliefs into facts. Most people embrace cultural beliefs tempered by science, and if the belief is strong, science takes a back seat. Experience trumps doubt.

Two maxims by Nobel laureates are instructive:

Science is the belief in the ignorance of experts. —Richard Feynman

What you see is all there is. —Daniel Kahneman

Believe no one without objective, replicable data—no matter how expert, honest, or emotionally compelling the source. What you see may be obvious, but wrong, since you may see only a sliver of the full dataset. Throughout human history, belief has been informed by the apparent quality of the evidence, repeated exposure, the need for an answer, and the belief of others.

In the case of MMJ and CBD for children with epilepsy, these criteria conspire to suspend belief in the scientific method for >90% of lay people. Reports of dramatic cures and personal benign experiences with cannabis hold tremendous sway over patients, parents, advocates, and politicians. Accounts of people who tried MMJ and did not improve or had psychiatric reactions do not make for compelling news reports and, therefore, do not inform the collective experience.

Beliefs about MMJ are influenced by the naturalistic fallacy—the concept that natural substances, for example, those from plants, are safe. Although intuitively attractive, we should know exactly what natural substances are given to a child; MMJ contains >500 compounds. We and many epileptologists who responded to the survey emphasized a distinction between therapies based on the whole plant (MMJ) and pharmaceuticals derived from isolated cannabinoids such as CBD, but the difference was not always clear to the survey respondents. Nature contains poisons from innocents like mushrooms and puffer fish. Pharmacology is derived from the Greek word pharmacon—substances with beneficial and toxic properties. Drugs have variable effects at different doses and in different people.

Is MMJ or CBD safe and effective for children with epilepsy? We don’t know. Are some children particularly vulnerable to the effects of tetrahydrocannabinol (THC)? Evidence suggests that early exposure to THC increases the risk of cognitive, addictive, and psychotic disorders. Are there subgroups of children for whom THC, CBD, or other compounds may exacerbate seizures? Many questions remain unanswered.

The lay community is correct in that these compounds may be beneficial. Some potential therapies carried along by public outcry were truly miracle cures (valproic acid, highly active antiretroviral therapy [HAART] for HIV), while others lacked any benefit or were harmful (hyperbaric oxygen for multiple sclerosis, laetrile for cancer).

Many patients, caregivers, and advocates mistake scientific objectivity for “nihilism” and worse, and relate it to the corrupt influence of the pharmaceutical industry. They fear that doctors fail to recognize the terrible side effects
of U.S. Food and Drug Administration (FDA)–approved antiepileptic drugs (AEDs) and the terrible burden of severe epilepsy. Families ask, “given the dramatic responses documented in the media, how could any reasonable physician deny access to MMJ?”

But that was not the question in the poll. Many clinicians advocate for access to MMJ and CBD in carefully supervised settings for children who have failed to respond to standard therapies. Most physicians are keenly aware that available AEDs often fail to control seizures and often have disabling side effects, and that the morbidity and potential mortality of severe epilepsy is horrific. But those truths do not provide objective data on the safety and efficacy of MMJ. They can influence the decision—formed by the principles of autonomy, beneficence, and nonmaleficence—about what is a reasonable course of action with limited scientific data. But they do not elevate the available data anywhere near the level of proof of efficacy and safety. They are separate issues.

Patient’s beliefs about the efficacy of MMJ and CBD may strongly influence clinical trials. There is an enormous degree of expectation of benefit from cannabinoids on the part of potential subjects. In the literature on pain, psychiatry, and Parkinson’s disease, such expectation influences placebo response and diminishes treatment effects. There is also the potential for “therapeutic misconception,” a bioethical concept in which research subjects fail to distinguish the difference between research and therapy.

As clinicians and scientists, we should not ignore these poll results and should acknowledge the public–medical divide on this issue. There should be more discussion and education—in both directions—to find common ground that can inform clinical decisions and advance scientific knowledge. Epileptologists should remain engaged in this dialogue, both in the clinic and in the public sphere. The public and state legislatures increasingly support access to MMJ by patients with epilepsy. If clinicians and scientists disengage from the dialogue, the MMJ industry will expand, promoting cures to desperate parents and, as with vitamin and nutritional supplements, the science will never catch up to the hype, drowned out by unverified claims, sensational testimonials, and clever marketing.

**Disclosure**

I have no conflict of interest to disclose. I confirm that I have read the Journal’s position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

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