



Movement and Nutrition in Health and Disease

Explaining the emergence of attention deficit hyperactivity disorder: Children, childhood, and historical change

| Review

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Abstract: This article argues that the origins of attention deficit hyperactivity disorder (ADHD) can be traced to the late 1950s, and the emergence of a series of political, demographic, technological, cultural, and environmental changes occurring in the United States. While some of these changes, for example, Cold War concerns about the Space Race and heightened academic expectations of children, cast hyperactive, inattentive, and impulsive behaviours in a negative light, others, such as the introduction of synthetic food additives in the American diet, increased the occurrence of these very same characteristics in American children. The article concludes by contending that it is crucial to understand these historical factors in order to develop effective and child-centred responses to ADHD.

Keywords: Attention deficit hyperactivity disorder; history; children; psychiatry; allergy.

1. Introduction

In April 2019, the Food and Drug Administration (FDA) in the United States approved the marketing of the Monarch external Trigeminal Nerve Stimulation (eTNS) System, the first non-drug treatment of ADHD [1]. The system, which can be used in the home, is the size of a mobile phone, and generates a low electrical pulse that is transmitted into the patient via a patch that is wired up to the device. Although the precise mechanism for eTNS remains a mystery, clinical trials have indicated that such stimulation can be therapeutic for children with ADHD [2].

For some parents of children diagnosed with ADHD who do not wish to go down the route of pharmacotherapy, eTNS may represent a welcome alternative, despite its \$1,000 price tag. Unlike stimulant drugs, which have been available in the United States for the treatment of children since 1962, eTNS does not cause any known side effects. But for others, the thought of wiring their child up to such a device might be

unpalatable. Mental health watchdog, the Citizens Commission on Human Rights International, for example, stated that they could not recommend a device that “electro-shocks children into docility”, drawing parallels between eTNS and the FDA’s recent approval of electroconvulsive therapy (ECT) for children over the age of 13 with bipolar disorder [3].

The recent debates about eTNS are only the latest chapter in the long, controversial history of ADHD. Although ADHD is often depicted as a neurological dysfunction that is genetic in nature, a close look at its history and the ways in which researchers, clinicians, and parents have attempted to understand it demonstrates that its origins are much more complex than that. First diagnosed in the late 1950s and quickly becoming the most common childhood disorder in the United States and, eventually, the world [4], ADHD has always divided opinion about what it is, whether it constitutes a mental disorder, what causes it, and how it should be treated. Usually missing in these debates, however, is any sense

of the history of ADHD, most notably, why the disorder emerged in the first place.

In what follows, I provide an overview of this history, arguing that it is helpful to divide the factors behind ADHD's emergence into two categories. The first category includes all the factors that gave rise to the idea that hyperactive, impulsive, and inattentive behaviour in children was serious enough to be considered a medical condition. Such behaviours were not always considered to be pathological; indeed, prior to the 1950s, psychiatrists and paediatricians were much more concerned by the very opposite sort of behaviours [5]. The second category includes all of the factors that – at roughly the same period in history – were contributing to more hyperactive, impulsive, and inattentive behaviour in children. In other words, ADHD emerged at a time when hyperactive, impulsive, and inattentive behaviour was not only becoming perceived as more problematic, but also at a time when such behaviours were becoming more common.

2. Changing expectations of children

ADHD as we know it [6] emerged in the United States during the late 1950s. The concept became known in Canada by the late 1960s, came to Australia and New Zealand by the 1970s, and began to spread elsewhere by the 1980s and 1990s [4]. So, why did it emerge in the United States when it did? To begin with, the 1950s were a time of enormous change for children. The first children diagnosed with hyperkinetic impulse disorder (a term coined in 1957, and one of many terms used to describe what we would call ADHD today) were of the baby boom generation, the largest cohort in American history. The 75 million baby boomers flooded into a school system that had been suffering from a lack of investment dating back to the Great Depression and reeling from a teacher shortage, as many female teachers chose to leave the profession to have families of their own after the end of the Second World War [7–9]. More so than any previous generation, education was seen to be vital to the success of the baby boom generation and, in turn, the success of the United States during the Cold War. Heightened educational expectations were spurred in part by the GI Bill of 1944, which provided funding for returning servicemen to complete higher education [10]. An expectation developed, therefore, that the children of the millions of veterans who benefitted from the GI Bill would also complete high school and go onto college.

American educational achievement was thrust into the spotlight in a more existential sense in September 1957, when the Soviet Union launched two Sputnik satellites into orbit. Sputnik convinced the American political, military, and educational establishment that they were losing the Cold War “brain race,” and, if they did not improve their education system, they would lose the Cold War altogether [11]. Within months, the National Defense Education Act (NDEA) was passed, outlining a clear strategy for getting the American education system back on track. One of the unintended consequences of NDEA was the emergence of ADHD.

NDEA tackled educational underachievement in three ways: First, it put additional emphasis on the importance of core subjects, such as mathematics, sciences, and English, shifting from a predominantly child-centred approach to education (Progressive Education), which had been prevalent for a number of decades, to a subject-centred approach [12]. Second, it stressed the importance of all students – no matter their class, race, or educational ability – staying in school as long as possible [13]. Finally, it provided for the hiring of thousands of guidance counsellors to identify and attempt to help children who appeared to be underachieving. These measures gave rise to ADHD because the type of behaviours associated with educational underachievement in these core subjects tended to consist of hyperactivity, impulsivity, and inattentiveness. Guidance counsellors would then refer these hyperactive, impulsive, and inattentive children to physicians, who would tend to diagnose them with hyperkinetic impulse disorder (or equivalent) and, following the FDA's approval of Ritalin for use in children in 1962, treat them with stimulant drugs.

Sputnik, therefore, served as a catalyst for heightened concerns about academic performance during the late 1950s, but other factors, ranging from the GI Bill to concerns about automation in the workplace, were also contributory. It should also be emphasised that, once Ritalin was approved for use in children, CIBA Pharmaceutical Company went to considerable lengths to stoke the concerns about hyperactivity, impulsivity, and inattention in children that had been fomented by Sputnik and NDEA, in order to market their product [14]. They were successful: by the late 1960s, Ritalin was their best-selling drug. American biological psychiatrists, determined to emphasise the neurological aspects of mental disorder at a time when psychoanalysts and social psychiatrists were highly influential, also played a key role in consolidating the view that such behavioural

problems were neurological and best treated with stimulant medication [15]. Finally, American parents (especially mothers) who had been implicated by both psychoanalysts and early autism researchers for the behavioural problems of their children, were often receptive of the concept of ADHD, which explained their children's struggles in an apparently scientific and non-judgemental way, and came with a readily available, inexpensive, and often effective pharmaceutical treatment [11]. Within ten years of Sputnik, what we now call ADHD was the most common childhood psychiatric disorder in the United States.

3. A changing environment for children

As expectations for American children's behaviour were increasing, so too was the social and physical environment in which they were expected to behave. These changes encompassed where children lived, how they played, how they were raised, and the chemicals to which they were exposed. As baby boomers flooded into American schools, their families were fleeing the cities for life in the newly-built suburbs [16]. The design of these suburbs often revolved around the automobile, and left little "wild" space for children to play in [17]. The baby boomers were also the first television generation, with the children and grandchildren, the first generations to spend time playing video games and using social media. Although corporal punishment was still employed, it was becoming less acceptable, meaning that parents and teachers had fewer means to control unruly children. While most would argue that this was a positive development, it is possible that into the corrective vacuum that was created came ADHD drugs; Ritalin may have replaced the rod. Finally, children were both directly and passively exposed to numerous new chemicals during the post-war period, most notably in the form of food chemicals, but also in terms of atmospheric lead and other pollutants [18]. The link between many of these factors and the epidemiology of ADHD remains contested and under-researched. But when methodical, rigorous, and unbiased research has been done into these connections, new insights into the nature of behavioural problems have emerged.

The association between food chemicals (especially food colours, but also flavours and preservatives) and ADHD provides an interesting case in point. Shortly after the term "allergy" was coined by Austrian paediatrician, Clemens von Pirquet, in 1906, clinicians began to recognise that food could trigger emotional disturbances and neurological symptoms, especially in children

[19–21]. A survey of North American physicians in 1950 confirmed the belief in this connection: 95 of the 171 allergists surveyed acknowledged "that they had noticed personality changes due to allergy which corrected themselves when the allergic element was eliminated" [22]. By the 1960s, amidst concern about environmental chemicals and health [23], allergists were beginning to raise alarm about food additives and behavioural problems as well [24].

Such warnings were amplified in 1974 with the publication of the book "Why Your Child is Hyperactive" by San Francisco allergist, Ben Feingold (1899-1982) [25]. Feingold had recognised the link between food additives and hyperactive behaviour in the late 1960s, and spent the early 1970s trying to get his findings presented at leading conferences and in respectable medical publications [26]. Finding himself excluded by the mainstream medical community, Feingold opted to publish a popular book with Random House; it soon became a best-seller and Feingold found himself discussing his food additive-free Feingold diet on national television. Clinical trials, some backed by the food industry lobby group, the Nutrition Foundation, were quickly designed to test Feingold's hypothesis, but little consensus emerged about what the trials revealed. Not only were there serious methodological problems inherent in the design of many of the trials, but also interpretations of trials (both individually and in aggregation) varied enormously. Then, in 1982, Feingold died and much of the media and medical interest in his diet faded away.

While these debates were unfolding, however, thousands of parents had been adopting additive-free diets with their children, with many of them finding success. A support organisation, the Feingold Association of the United States (FAUS), soon emerged to raise awareness about the diet, help parents identify food additive-free foods, and lobby for better labelling. At a grassroots level, interest in the Feingold diet slowly increased. During the early 2000s, the Food Standards Agency (FSA) in the United Kingdom, was pressured by parents to fund new research into Feingold's hypothesis. Two studies emerged, both of which demonstrated a link between food additives and ADHD [27,28]. Soon the FSA and the European Food Safety Authority revised their guidelines on food additives, resulting in new warning labels on foods containing certain food dyes, and many food producers and grocery stores voluntarily began to reduce or eliminate the number of foods containing such additives. In 2011, the FDA in the United States launched

hearings into the issue, which included testimony from FAUS and other supporters of the Feingold diet. On the basis of an 8-6 vote, they decided not to take any action, but called on yet more research to be done. Although a 2018 policy report by the American Academy of Pediatrics on food additives and health emphasised the risks such chemicals posed to child health, there was only one brief mention of ADHD and no mention of Feingold [29].

4. Conclusion

The story of food additives and ADHD demonstrates how contested and controversial alternative ideas about the causes and treatment of ADHD have been. Despite over 40 years of parent testimony, dozens of positive trials, changes to labelling legislation in Europe, and the food industry voluntarily removing additives from their products, medical opinion about the issue remains divided. Similarly, in the face of considerable evidence that ADHD emerged at a certain time and place and for specific reasons, the predominant tendency in the media and within medicine is to perceive the condition as a wholly neurological condition that is best treated pharmacologically. I would humbly suggest that the first step in resolving such debates and, in turn, develop a more sophisticated, nuanced, and patient-centred understanding of this controversial condition is to pay more attention to its history.

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Conflict of interest

The author declares no conflict of interest.

References

- Smith A. FDA permits marketing of first non-drug treatment of ADHD. *PharmaTimes Online*. April 23, 2019. http://www.pharmatimes.com/news/fda_permits_marketing_of_first_non-drug_treatment_for_adhd_1285317. Accessed May 20, 2019.
- McGough JJ, Sturm A, Cowen J, et al. Double-blind, sham-controlled pilot study of trigeminal nerve stimulation of attention-deficit/hyperactivity disorder. *J Am Acad Child Adolesc Psychiatry* 2019; 58: 403–411.
- CCHR condemns FDA's approval of electricity-zapping for 'ADHD' kids. https://finance.yahoo.com/news/cchr-condemns-fdas-approval-electricity-181500789.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAFKHSmcepuJlxYf3_HMmV4u3cIKJ75zrkvCchl_LdZR0GPG-_bTgha5RDulEMx7vFPOb_DyIRjNsQyagfeRrG17wJSqn7KT
- Smith M. Hyperactive around the world: the history of ADHD in global perspective. *Soc Hist Med* 2017; 30: 767–787.
- Smith M. Snips and snails and puppy dog tails: boys and behaviour in the USA. *Can Bull Med Hist* 2019; 36: 51–79.
- Smith M. The uses and abuses of the history of hyperactivity. In: Graham L, ed. (De)constructing ADHD: Critical Guidance for Teachers and Teacher Educators. New York: Peter Lang, 2010: 21–39.
- Bernstein I. Promises kept: John F. Kennedy's new frontier. New York: Oxford University Press, 1991.
- May ET. *Homeward bound: American families in the Cold War era*. Revised Edition. New York: Basic Books, 2017 [1988].
- Owram D. *Born at the right time: a history of the baby-boom generation*. Toronto: University of Toronto Press, 1996.
- Mettler S. *Soldiers to citizens: the G.I. Bill and the making of the greatest generation*. Oxford: Oxford University Press, 2005.
- Smith M. *Hyperactive: the controversial history of ADHD*. London: Reaktion, 2012.
- Ravitch D. *The troubled crusade: American education, 1945-1980*. New York: Basic Books, 1983.
- Conant JB. *Slums and Suburbs*. New York: McGraw-Hill, 1962.
- Schrag P, Divoky D. *The myth of the hyperactive child: and other means of child control*. New York: Penguin, 1975.
- Smith M. Psychiatry limited: hyperactivity and the evolution of American psychiatry, 1957–1980. *Soc Hist Med* 2008; 17: 541–559.
- Ramsden E, Smith M. Remembering the West End: social science, mental health and the American urban environment, 1939–1968. *Urban History* 2018; 45: 128–149.
- Louv R. *Last child in the woods: saving our children from nature deficit disorder*. Chapel Hill, NC: Algonquin Books, 2005.
- Silbergeld EK, Goldberg AM. Hyperactivity: a lead-induced behavior disorder. *Env Health Pers* 1975; 7: 227–232.
- Hoobler BR. Some early symptoms suggesting protein sensitization in infancy. *Am J Dis Child* 1916; 12: 129–135.
- Shannon WR. Neuropathic manifestations in infants and children as a result of anaphylactic reactions to food contained in their dietary. *Am J Dis Child* 1922; 24: 89–94.
- Smith M. *Another person's poison: a history of food allergy*. New York: Columbia University Press, 2015.
- Clarke TW. The relation of allergy to character problems in children; a survey. *Psychiatr Q* 1950; 24: 21–38.
- Carson R. *Silent spring*. Boston: Houghton Mifflin, 1962.
- Randolph TG. Clinical ecology as it affects the psychiatric patient. *Intl J Soc Psychiatry* 1966; 12: 245–254.
- Feingold BF. *Why your child is hyperactive*. New York: Random House, 1974.
- Smith M. *An alternative history of hyperactivity: food additives and the Feingold diet*. New Brunswick, NJ: Rutgers University Press, 2012.
- Bateman, B, Warner JO, Hutchinson E, et al. The effects of a double-blind, placebo-controlled, artificial food colourings and benzoate preservative challenge on

- hyperactivity in a general populations sample of preschool children. *Arch Dis Childhood* 2004; 89: 506–511.
- 28 McCann D, Barrett A, Cooper A, et al. Food additives and hyperactive behaviour in 3-year-old and 8/9-year-old children in the community: a randomised, double-blinded, placebo-controlled trial. *Lancet* 2007; 307: 1560–1567.
- 29 Trasande L, Shaffer RM, Sathyanarayana S. Food additives and child health. *Pediatrics* 2018; 142: e20181408.