Audiovisual hyperactivity disorder (AVHD): a peril of the desire to Excel

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Attention deficit hyperactivity disorder (ADHD) is a well-recognized behavioural problem in children.[1] Perhaps Heinrich Hoffmann's *Struwwelpeter*,[2] a popular German tale written in rhyme for children, describes an index case. The clinical characteristics and diagnostic criteria of ADHD[3] are shown in Table 1. We have observed most of these clinical features in physicians during academic rounds when they choose to use PowerPoint presentations rather than simple slide shows. We undertook an observational study to document the incidence and age of onset of this audiovisual hyperactivity disorder (AVHD) among physicians in an academic setting and to describe the visual clues that should prompt a diagnosis and lead to immediate intervention on humanitarian grounds.

Methods

The study was conducted in the Department of Pediatrics of the University of British Columbia, Vancouver. We were all familiar with the diagnostic criteria for ADHD and documented the incidence of comparable behaviours in presenters at weekly academic grand rounds. Presenters were divided into 2 age groups: those less than 30 and those 30 years of age and older. In addition, we documented the sex of the presenters and the medium chosen for presentation — PowerPoint presentation (PPP) or simple slide show (SSS).

Baseline data were collected by observing each presenter "at rest" before his or her presentation. We continued the observation following the ordeal (presentation) to document recovery time from visible dysfunction. The measures observed were overt operator physical signs of autonomic dysfunction (OOPS): increased facial colour, sweating, tremors, ticks and incoordination, raised vocal volume and descent into infantile or foul language

(coprolalia). A Likert scale was used to rate the severity of the signs (0 = normal or nil, 5 = abnormal or extreme). A secondary outcome measure was the extent of peer assistance: the number of audience members coming up to assist the presenter, their proximity to the podium, the volume of the ensuing conversation and the level of practical intervention were scored.

The data were processed both by pen and paper exercises and by an electronic medium, to avoid bias. The marker of statistical relevance used was the Ah^2 value.[4]

Results

The age distribution of presenters in the 2 groups and the severity of the major OOPS signs observed are shown in Table 2. Men and women were equally represented. For convenience, the 100 most typical cases are shown.

Age was significantly associated with choice of presentation format: 99% of the presenters in the SSS group were 30 years and older, whereas in the PPP group impetuous youth braving this medium outnumbered the older presenters more than 2:1.

In the PPP group, the mean severity scores for the OOPS signs were dramatically higher in the older group than in the younger group ($Ah^2 > 0.99$). However, early signs of behavioural dysfunction were also evident in the younger PPP group. In the SSS group, extreme responses were observed only in 2 presenters, both with outlying events (a youthful presenter experienced a major autonomic change in facial colour when 2 of her slides were projected upside down, and a senior faculty member uttered an unfortunate expletive when all of his slides fell from the carousel to the floor as he mounted the podium).

Significant differences in peer response were evident between the PPP and SSS groups. In the former, large numbers of the audience exhibited bizarre group behaviour when there was laptop–projector incompatibility, hopeless resolution, calling up of wrong files and computer crashes. In 12% of the PPP presentations, more than 10 people were counted around the podium actively troubleshooting problems or counselling the presenter, or both. In the SSS group, peer response was rare, but it did raise the spectre of age and sex bias. Of the 2 slide users with outlying events, the youthful presenter received supportive murmurs from the audience and verbal reassurance from the moderator, whereas the older faculty member received no audience response or moderator assistance.

Among the slide users, the incidence of generic slide trauma (GST) was low, residual physical and emotional ef-

Table 1: Diagnostic criteria for attention deficit hyperactivity disorder (ADHD) and occurrence of these behaviours in people with audiovisual hyperactivity disorder (AVHD)

ADHD diagnostic criteria*	Occurrence in AVHD
Fidgets with hands or feet or squirms in seat	+++
Has difficulty remaining seated	++
Is easily distracted	+/–
Has difficulty waiting turn	++++
Has difficulty following instruction	+++
Often talks excessively	++
Behaviour often interrupts or intrudes on others	++++
May not seem to listen	++++
Often loses essential items (e.g., notes, pointers)	++
Often engages in activities without consideration of consequences	+++
Has difficulty playing quietly	+/–
Often blurts out questions or judgements	+++++

*Modified from DSM-III-R criteria.[3] ADHD is diagnosed if 8 or more of the above behavioural disturbances are present.

Table 2: Observed behaviours and recovery times of presenters and assistance received from audience members

	SSS group		PPP group	
Variable	< 30 years old *n = 1*	≥ 30 years old *n = 99*	< 30 years old *n = 70*	≥ 30 years old *n = 30*
OOPS sign, mean severity score (and range)*				
Change in facial colour	3†	1.2 (0–2)	1.0 (0–2)	4.8 (2–5)
Sweating	1	1.5 (0–2)	2.0 (1–3)	4.8 (2–5)
Tremors	1	0.2 (0–1)	3.0 (2–4)	4.8 (2–5)
Childish or foul language	0	0.9 (0–5)‡	4.0 (3–5)	4.8 (2–5)
No. of audience members who assisted presenter, no. (and %) of presenters				
0–1	0 (100)	98 (99.0)	0	0
2–4	–	1 (1.0)	35 (50.0)	5 (16.7)
5–10	–	–	30 (42.9)	20 (66.7)
> 10	–	–	5 (7.1)	5 (16.7)
Mean recovery time from visible dysfunction (and range)	Immediate and uneventful	< 10 min (0–90)	20 min (10–90)	36 h (1 h–never)

Note: SSS = simple slide show, PPP = PowerPoint presentation, OOPS = overt operator physical signs of autonomic dysfunction.
*Severity of OOPS signs was rated by observers using a 5-point Likert scale (0 = normal or nil, 5 = abnormal or extreme).
†Presenter experienced an outlying event (2 slides were projected upside down).
‡One presenter experienced an outlying event (all slides fell from carousel to floor).

fects were brief, and recovery times were unremarkable. However, in the PPP group, PowerPoint slide trauma (PST) was alarmingly common and recovery time worryingly long. Youth clearly provided an advantage: the younger presenters had a mean recovery time from visible dysfunction of 20 minutes, as compared with 36 hours usually needed by the older faculty members (Table 2). In terms of health care delivery, though, some junior faculty members were not fully functional for up to 90 minutes after a presentation, and some senior faculty members have yet to recover.

Interpretation

AVHD is a new behavioural disorder seen in people attempting to Excel in presentations by projecting Word(s) with PowerPoint. It manifests most commonly as MACNAB syndrome (*m*ania in *a*cademic *c*omputer *n*eophytes due to *a*udiovisual *b*ravado).

It is our impression that people with AVHD are typically of normal intelligence but have abnormal behaviour characteristics that are predominantly due to overstimulation of the autonomic nervous system. As with ADHD, agitation, impulsiveness and hyperactivity often cause AVHD sufferers to perform poorly in academic settings and make extreme demands on their peers or audience. We estimate that the majority of faculty members 30 years of age and older have AVHD to some degree, which would make this the most common behavioural disorder among physicians. Worryingly, younger faculty members are not immune to the disorder, as there was clear evidence of early symptom evolution in the PPP group less than 30 years old.

Unlike ADHD, AVHD appears to have no sex bias. Clearly, this is one area where the X chromosome offers no protection. In cases of AVHD, agitation is evident immediately after the presenter is called to the podium, with hyperactivity often beginning soon after the presentation has started. All those affected typically have difficulty sitting still before their presentation. The adverse effects of AVHD hyperkinesis do not usually resolve rapidly. Residual symptoms (short attention span and immature behaviour) persist and probably impose significant burdens on the delivery of health care by faculty following their presentations. PST (PowerPoint slide trauma) is clearly more disruptive in this context than GST (generic slide trauma).

For once a careful history is not essential for formulating a diagnosis. Once aware of AVHD, physicians will be able to detect the signs readily and should feel able to make the diagnosis with confidence.

No laboratory studies are currently available to confirm the clinical diagnosis of AVHD. The cause is clearly GENETIC (*g*enerated *e*xclusively in *n*eophytes with *e*lectrical and *t*echnical *i*nnovation *c*hallenge), but the Human Genome Project has yet to map AVHD to a specific gene. Unlike obsessive compulsive disorder,[5] there is no evidence of an autoimmune component in AVHD. Although central nervous system stimulants have shown a striking benefit in 75% of children with ADHD,[1] massive doses of a benzodiazepine appear more logical in cases of AVHD (A.J.M.: personal observation). We have not identified diet as a causal factor; however, folate supplementation will inevitably be explored. People with AVHD should be counselled that most dietary manipulations (with the possible exception of a stiff drink) will neither be of benefit nor contribute to the disorder.

Shakespeare probably foresaw AVHD. Certainly he describes the root cause in most cases: "The common curse of mankind, folly and ignorance, be thine in great revenue,"[6] and identified society's cure: "We have our philosophical persons, to make modern and familiar, things supernatural and causeless."[7] In addition, the Earl of Birkenhead identified benefit in the supportive group behaviours we observed in response to overt AVHD: "What I like about scientists is that they are a team."[8]

We could find no limitations in our study. On the contrary, we are united in our belief that the study was brilliant, insightful and timely.

Implications for practice

Innate empathy should be nurtured among faculty members for those afflicted with AVHD. For PPP users, OOPS signs may be prevented with the daily use of SALICYLATES (*s*essions for *a*cademics with *l*ikeable, *I*nternet-*c*ognizant *y*outh to *l*earn *a*udiovisual *t*echnology *e*ssential *s*kills). In addition, we recommend that government warnings be prominently displayed on all PowerPoint software and projection hardware.

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Contributors: Dr. Macnab has the disorder and wrote the paper. Mr. Duffy coined the diagnostic term. Drs. Milligan, Miller, George, Grant and Steinraths emphatically deny any symptoms of AVHD but observed them enthusiastically in older faculty members.

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