











PediaNews

The Official Newsletter of the Student Society of Pediatric Advocates (RxPups)

ADHD Medication Overuse

Written By: Anisha Patel, PharmD Candidate 2019

As the number of ADHD diagnoses slowly increases year by year, we are seeing more prescriptions being filled for controlled substances and a variety of new medications being introduced to treat this disorder. Attention Deficit Hyperactivity Disorder, or ADHD, is a neurodevelopmental disorder that is often discovered in early childhood and may continue into adulthood. The cause of ADHD remains unknown, but researchers believe there is some degree of genetic inheritance involved. According to Block et al., individuals who do not have ADHD may, at times, display symptoms of the disorder but those diagnosed with ADHD must display symptoms most of the time and across multiple settings such as at home and at school. These inconsistent symptoms often lead to misdiagnoses.

According to the fifth edition of Diagnostic and Statistical Manual of Mental Disorder (DSM-5), a child must display six or more ADHD symptoms for six months or longer in order to be diagnosed. An adult however must experience 5 or more symptoms to be eligible for diagnosis. The guidelines primarily rely on subjective information such as how often one has trouble staying focused or how often one forgets to complete daily activities such as

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Editors

Linda Logan, Pharm.D., BCPS, BCACP Faculty Advisor

Paige Watkins, Pharm.D., PGY2 Pediatric Pharmacy Resident

Namita Patel, PharmD Candidate Class of 2019 University of Georgia

College of Pharmacy

















ADHD Medication Overuse (Cont.)

chores. This in itself can lead to discrepancies in who is diagnosed with the disorder and who should be receiving treatment for it . The ideal treatment regimen for someone diagnosed with ADHD should begin with some combination of counseling, education, and behavioral therapy or psychotherapy. If behavioral and nonpharmacological interventions do not lead to improvement and if there is a moderate to severe functional disturbance caused by ADHD, stimulating medications may be considered. ²

The issue of overuse arises when different diagnostic measures are used and when physicians choose to medicate patients before trying nonpharmacologic options. Over 11% of school-aged children (6.4 million) were diagnosed with ADHD in 2011 and the number continues to rise each year. "Those are astronomical numbers. I'm floored," said Dr. William Garf, a pediatric neurologist and professor at the Yale School of Medicine. "Mild symptoms are being diagnosed so readily, which goes well beyond the disorder and beyond the zone of ambiguity to pure enhancement of children who are otherwise healthy." ³

ADHD remains underdiagnosed and undertreated in many countries such as China and Brazil but over treated in countries such as the United States.⁴ As the rates of diagnosis increase, children may take stimulants merely to calm down or to do better in school. As these children make their way to college, medications may be shared with or sold to classmates.³ Chronic, long-term use can lead to various health concerns beginning with dependence. Concerns of stunting growth and sudden death from cardiac effects have become primary issues with overuse and long-term use. Other effects include worsening of tics or seizures in affected people, insomnia, suicidal thinking, and the possibilities of long-term effects on brain development or self-image.⁴

Attention Deficit Hyperactivity Disorder diagnoses and subsequent stimulant prescribing continue to rise year by year. The increasing number of stimulants prescribed may lead to an increase in abuse of medication. This overuse can also lead to long-term dependence which is becoming a more prominent issue. As this becomes a larger problem, it is important that prescribers are aware of appropriate stimulant prescribing and ways to prevent medication overuse and abuse.

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The Use of a 3rd Dose of MMR as Post– Exposure Prophylaxis for Mumps

Written By: Kajal Jain, PharmD Candidate 2019

Mumps is a disease that is no longer common in the United States, although there are still periodically outbreaks. These outbreaks occur in areas where people are living in close quarters such as college campuses. The characteristic signs of the mumps include swelling of the salivary glands and puffy cheeks. If a person contracts the



mumps, they are contagious from before the swelling of the salivary glands begins and up to 5 days after the swelling occurs. One of the most common

complications from the mumps can is inflammation of the testicles, which occurs in 60-83% of male patients. Less commonly there may be the development of deafness, pancreatitis, or inflammation of the breasts, ovaries, brain, or spinal cord.² This is a viral disease, and because of that treatment is mainly symptomatic management. Rest, over the counter pain medications, drinking plenty of water, and a hot or cold compress can all be beneficial in the management of symptoms caused by the mumps.³

The current childhood vaccination schedule recommends one dose of the measles, mumps, and rubella (MMR) vaccine between 12 and 15 months and another dose between the ages of 4 and 6 years old. As of 2016, 8.1% of children ages 19 to 35 months old had not received the MMR vaccine⁴. Lower vaccine rates are linked with

higher rates of disease contraction and spread. If more and more of the population is unvaccinated, then the chances of both contracting the disease and spreading it are increased.

That brings up the question of what to do in case there is an outbreak of the mumps. At the University of lowa, there was an outbreak in 2015, and they looked at whether receiving a third dose of MMR as post-exposure prophylaxis was effective in preventing the mumps. The study looked at the University of Iowa student population, which consisted of 20,496 students, and 20,107 of those students had two or more doses in the past. Of these students, 4,793 received a third dose as post exposure prophylaxis during the outbreak period.⁵

The attack rate in number of cases per 1,000 people were as follows:⁵

- 12.6 in the entire group of 20,496 students
- 14.5 in the group that had two doses of MMR
- 6.7 in the group that had three doses of MMR

Getting a third dose of MMR vaccine showed a 78.1% effectiveness compared to two doses after 28 days. The probability of remaining mumps free was also increased in the patients who received three doses.

Another important factor that the study addressed was the impact of waning immunity. The current vaccination schedule provided by the CDC does not require a dose of MMR after the age of 6 years old. Because of this, there is a risk of waning immunity, especially as one gets older.

















The Use of a 3rd Dose of MMR as Post—Exposure Prophylaxis for Mumps (Cont.)

The attack rate in number of cases per 1,000 people were as follows:⁵

- 1.6 if it had been 0-2 years since the second dose of MMR
- 3.9 if it had been 3-12 years since the second dose of MMR
- 11.2 if it had been 13-15 years since the second dose of MMR
- 17.6 if it had been 16-23 years since the second dose of MMR

The attack rate was higher in the groups in which more time had passed since they had received their second dose. From these findings, they were able to conclude that as time passed, there was waning immunity most likely due to antibodies decreasing over time. ⁵

The mumps is not a very common disease in the United States anymore, but there are still outbreaks as seen at the University of Iowa. Through the study, it was concluded that receiving a third dose of the MMR vaccine as post-exposure prophylaxis is effective in preventing the mumps due to decreased immunity as time passes since receiving the second dose.

These findings could be crucial if and when another outbreak occurs on a college campus or any other setting. It is also possible that with more studies, there may be a movement to add a third dose of MMR to the vaccination schedule to help boost immunity, but only time will tell if this will happen.

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The Impact of Social Media on Young Adolescents

Written By: Namita Patel, PharmD. Candidate 2019

In developing countries, digital technology has become a crucial aspect in the lives of most adolescents. Also known as the "digital natives", these adolescents use social media, such as Facebook and Twitter, daily to feel a sense of belonging, to develop psychosocial wellbeing and to form an identity. Social media has provided them with an outlet to connect and interact with their peers. Although social media can have positive implications, it can also have negative consequences. Research conveys that adolescents who have a better sense of belonging in school are more likely to perform better academically. Conversely adolescents who have a weaker sense of belonging are more likely to participate in maladaptive behavior. Social media can influence adolescents' levels of anxiety, loneliness and depression. Thus it is important to understand the impact that social media can have on an adolescent's mental health in order to understand how it may impact their social development.

Sense of Belonging

Psychosocial Wellbeing

Identity development

Social media can affect an adolescent's sense of belonging. Young people use their phones and computers daily to message, text, and tweet to their peers. It allows them to interact with others who have the same beliefs

and interests as them regardless of where they are, thus broadening their friend group. In other words, they do not have to be face to face to "stay in touch." Also adolescents can gain validation of their thoughts and experiences from their peers which in return increases their sense of belonging. Although this does seem to be beneficial for young people, it can also have a negative impact. Adolescents may feel less of a sense of belonging due to social exclusion, ostracism and social disconnection. Cyberostracism is a term created that describes how an adolescent may feel due to their isolation from others while online.1 Adolescents can feel excluded by being defriended on Facebook, being excluded from Facebook groups, and being denied access to follow others on Twitter.2

An adolescent's psychosocial wellbeing may also be impacted by social media. Social media can affect their sense of loneliness, or how their expectations of social contact correlates with their lived experiences. Studies show that online communication may be beneficial for young people who are socially anxious, because it allows them to make friendships without having personal contact. During their online communication, they do not have to make eye contact or respond instantaneously. On the other hand, it has been shown that social media can have a negative impact on adolescents who have learning disabilities. Adolescents with learning disabilities may be using online communication to form fewer personal relationships. Loneliness can affect an adolescent's wellbeing and in return can affect their development.

Social media can have positive or negative impact on identity development.

















The Impact of Social Media on Young Adolescents (Cont.)

Adolescents can use social media to connect with others who are similar to them. There are currently 25 ADHD Facebook groups with over 100 members. In these groups, they portray students with ADHD in a positive light, as the group provides support to one another.3 Additionally, adolescents who use online communication were shown to have greater self-concept clarity; they had a well-defined sense of self. Some individuals use social media in a positive manner, others may use it negatively. An adolescent's prefrontal cortex is still developing and thus they have difficulties with impulse control and realizing the consequences of their actions. Overall, they have a limited capacity for self-regulation. Young people may post comments or pictures which may lead them to get bullied or harassed, because they may draw attention from their peers or unwanted attention

from an unintended audience. Social media and its effect on social identity needs to be further evaluated.

The interaction between social media and social connectedness and its effect on adolescents is very important. Adolescents are on social media daily as they are on Facebook, Twitter and Instagram. Although the use of social media is significant, the research is still preliminary and still needs further investigation. The influences can be paradoxical, and thus the relationship between social and social connectedness needs further inquiry so that parents, teacher and young people themselves can be more aware of its influence and how it can affect the development of adolescents.

The Impact of Social Media on Young Adolescents References:

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How Does Childhood Trauma Affect Future Health Outcomes? An Introduction to ACE Scores

Written By: Amanda Wolfe, PharmD Candidate 2020

While many would agree that negative childhood experiences impact adolescents and adults psychologically, people may not consider how recurrent traumatic events can affect physical health later in life. In 1998 a select few set out to study the correlation between childhood trauma with physical health outcomes, and the first article on adverse childhood experience (ACE) scores was published. Since then, there have been many studies delving into how childhood trauma may impact chronic diseases. While these studies may not provide insight for all chronic disease states, they serve as initial exposure to an important and developing clinical finding.

The original study looked at a sample of almost 13,500 individuals over the course of four months who visited the Kaiser San Diego Health Appraisal Clinic and were members of the Kaiser Health Plan. Each member was mailed the ACE questionnaire one week after their clinic visit, and 9,500 people responded. This was then repeated during the following year.

In order to evaluate a broad selection of adverse childhood experiences, the study was broken down into multiple categories. Patients were asked about three categories of childhood abuse: psychological, physical, and contact sexual. Another element included their exposure to four specific household issues including substance abuse, mental illness, violent treatment of a maternal

Prevalence of Categories of Adverse Childhood Exposures by Demographic Characteristics

		Number of categories (%) a						
Characteristic	Sample size (N)	0	1	2	3	4		
Age group (years)								
19-34	807	35.4	25.4	17.2	11.0	10.9		
35-49	2,063	39.3	25.1	15.6	9.1	10.9		
50-64	2,577	46.5	25.2	13.9	7.9	6.6		
≥65	2,610	60.0	24.5	8.9	4.2	2.4		
Gender ^b								
Women	4,197	45.4	24.0	13.4	8.7	8.5		
Men	3,859	53.7	25.8	11.6	5.0	3.9		
Raceb								
White	6,432	49.7	25.3	12.4	6.7	6.0		
Black	385	38.8	25.7	16.3	12.3	7.0		
Hispanic	431	42.9	24.9	13.7	7.4	11.2		
Asian	508	66.0	19.0	9.9	3.4	1.7		
Other	300	41.0	23.5	13.9	9.5	12.1		
Education ^b								
No HS diploma	480	56.5	21.5	8.4	6.5	7.2		
HS graduate	1,536	51.6	24.5	11.3	7.4	5.2		
Any college	2,541	44.1	25.5	14.8	7.8	7.8		
College graduate	3,499	51.4	25.1	12.1	6.1	5.3		
All participants	8,056	49.5	24.9	12.5	6.9	6.2		

View Table in HTML

 $^{
m a}$ The number of categories of exposure was simply the sum of each of the seven individual categories that were assessed (see Table 1).

b Prevalence estimates adjusted for age.

figure, and criminal behavior.
Researchers measured exposure
to these incidents o (unexposed)
to 7 (exposed to all categories).
These exposures, termed adverse
childhood experience (ACE)
scores, were then compared to
past medical history for diseases
that are considered among the
highest leading causes of
mortality in America. These
included ischemic heart disease,
cancer, COPD, diabetes, and
hepatitis.

Over half (52%) of the participants had experienced at least one category of adverse childhood exposure, and 6.2% stated experiencing over four of the seven childhood adverse event categories. **Table 1** demonstrates the different characteristics of the sample (i.e. age, gender, and ethnicity) and how many categories of adverse childhood exposures each had reported experiencing.

How Does Childhood Trauma Affect Future Health Outcomes? (Cont.)

Relationship Between Number of Categories of Childhood Exposure and Number of Risk Factors for the Leading Causes of Deatha

		% with	number o	f risk fact	ors	
Number of categories	Sample size	0	1	2	3	4
0	3,861	56	29	10	4	1
1	2,009	42	33	16	6	2
2	1,051	31	33	20	10	4
3	590	24	33	20	13	7
≥4	545	14	26	28	17	7
Total	8,056	44	31	15	7	3

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^a Risk factors include: smoking, severe obesity, physical inactivity, depressed mood, suicide attempt, alcoholism, any drug use, injected drug use, ≥50 lifetime sexual partners, and history of a sexually

The study then compared the number of risk factors patients were exposed to with the number of categories of adverse childhood events they reported experiencing as shown in **Table 2**. As noted beneath the table, the study included ten risk factors: smoking, severe obesity, physical inactivity, depressed mood, suicide attempt, alcoholism, any drug use, intravenous drug use, having over fifty lifetime sexual partners, and a history of a sexually transmitted diseases. The researchers then used data collected on each

participant's disease states prior to the patients receiving questionnaires and compared the information to the ACE scores of each patient.

Table 3 highlights this information and illustrates the odds ratio of experiencing certain diseases with an increasing number of traumatic childhood events. Markedly, patients exposed to four or more adverse childhood events, according to this study, were at least two times more likely to experience ischemic heart disease, strokes, and chronic bronchitis or emphysema. They were almost two times more likely to experience cancer or diabetes.

Although these results are noteworthy, they are more than likely underestimated. This data is based on patient-reported Information regarding events which took place during the patients' childhoods, which may mean that traumatic experiences could be inaccurately reported.

Number of Categories of Adverse Childhood Exposure and the Prevalence and Risk (Adjusted Odds Ratio) of Heart Attack, Cancer, Stroke, COPD, and Diabetes

Disease condition d	Number of categories	Sample size (N) a	Prevalence (%)	Adjusted odds ratio c	95% confidence interval
Ischemic heart disease	0	3,859	3.7	1.0	Referent
	1	2,009	3.5	0.9	(0.7-1.3)
	2	1,050	3.4	0.9	(0.6-1.4)
	3	590	4.6	1.4	(0.8-2.4)
	4 or more	545	5.6	2.2	(1.3-3.7)
	Total	8,022	3.8	-	_
Any cancer	0	3,842	1.9	1.0	Referent
	1	1,995	1.9	1.2	(1.0-1.5)
	2	1,043	1.9	1.2	(1.0-1.5)
	3	588	1.9	1.0	(0.7-1.5)
	4 or more	543	1.9	1.9	(1.3-2.7)
	Total	8,011	1.9	-	-
Stroke	0	3,832	2.6	1.0	Referent
	1	1,993	2.4	0.9	(0.7-1.3)
	2	1,042	2.0	0.7	(0.4-1.3)
	3	588	2.9	1.3	(0.7-2.4)
	4 or more	543	4.1	2.4	(1.3-4.3)
	Total	7,998	2.6	-	-
Chronic bronchitis or	0	3,758	2.8	1.0	Referent
emphysema	1	1,939	4.4	1.6	(1.2-2.1)
	2	1,009	4.4	1.6	(1.1-2.3)
	3	565	5.7	2.2	(1.4-3.3)
	4 or more	512	8.7	3.9	(2.6-5.8)
	Total	7,783	4.0	-	-
Diabetes	0	3,850	4.3	1.0	Referent
	1	2,002	4.1	1.0	(0.7-1.3)
	2	1,046	3.9	0.9	(0.6-1.3)
	3	587	5.0	1.2	(0.8-1.9)
	4 or more	542	5.8	1.6	(1.0-2.5)
	Total	8,027	4.3	_	_

- Sample sizes will vary due to incomplete or missing information about health problems.
- b Prevalence estimates are adjusted for age.

 C Odds ratios adjusted for age, gender, race, and educational attainment.

 d Indicates information recorded in the patient's chart before the study questionnaire was mailed.

How Does Childhood Trauma Affect Future Health Outcomes? (Cont.)

Previous studies have shown that the relationship between negative childhood experiences and health risk factors is greatly diminished due to incomplete self-report (Femina, 1990).

Out of the 9,500 respondents, over 1,300 participants were excluded from the analysis for failure to answer specific questions about their adverse childhood experiences, with the majority of these questions related to childhood sexual abuse. Gathering such sensitive information creates an obstacle in representing the data accurately as many of these participants probably experienced traumatic childhood experiences but were uncomfortable reporting them. The study also indicated how premature mortality in adults who experienced childhood trauma and then comorbidities skews the data as well since their additional information would have strengthened the results of the study.

The question after analyzing this study remains—how does this relate to pharmacy? Another study was done the following year through the same clinic assessing the relationship between ACE scores and prescription drug use. To no surprise, the higher the ACE score, the more prescription drugs patients were prescribed in general due to chronic disease states. What is the connection then between childhood trauma and health outcomes/prescription drug use? The answer is thought to lie in the pathophysiology of the hypothalamic-pituitary-adrenal, or HPA, axis. The HPA axis is responsible for releasing stress hormones such as adrenaline or cortisol when the body identifies dangerous, possibly life-threatening situations. This mechanism is essential to our survival in life-threatening situations; however, when this system is repeatedly activated on a daily or weekly basis especially during childhood, developing nervous systems can be tremendously harmed. One primary example is the effects on the ventral tegmental area (VTA) in the nucleus accumbens. This is the brain's reward center, and when it is damaged, children may seek to engage in rewarding yet high-risk behaviors early on such as smoking or substance abuse. Another equally important effect of the HPA axis is on the immune system. Trauma to this center can lead to chronic inflammation, which may increase the risk of disease states such as COPD.

While there are pharmacologic mechanisms to alter neurotransmitters involved in the HPA axis and nucleus accumbens, the best treatment against nervous system damage through trauma is prevention. How can childhood trauma be prevented? Screening for ACE scores in young children is a start. While addressing parental and household problems is beyond the scope of healthcare practice, identifying them early on and referring patients to more equipped professionals such as social workers would play a key role in prevention. Screening pregnant women and young families or couples for alcohol and drug use, risky sexual behavior, and mental disorders could lead to parental treatment as well. As the neurological effects of childhood trauma are continually studied, possible pharmacologic options may open the door to preventative treatment against brain damage in younger children and adolescents. Our goal as healthcare professionals is to not only prevent harm for patients and lengthen lifespan but also increase the quality of our patients' lives. Through continued research and education regarding ACE scores, chronic diseases in adulthood could be prevented by identifying trauma in children early on.

















How Does Childhood Trauma Affect Future Health Outcomes References:

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If you would like to contribute to PediaNews, please contact Namita Patel at namita3@uga.edu

Student Society of Pediatric Advocates

The Student Society of Pediatric Advocates is a student organization affiliated with the University of Georgia College of Pharmacy. We are a student group associated with the Pediatric Pharmacy Advocacy Group. The Mission of the SSPA is to bring awareness to the proper use of medication therapy in pediatric populations through various service and education-based initiatives. Service activities center around lending our medication-based knowledge to pediatric patients and their parents in our community. Educational activities are directed toward student members in an effort to safely and effectively extend pharmacy practice to pediatric populations by building relationships with mentors and professionals in the health care community, as well as supplementing didactic coursework with lectures by specialists and our peers. Overall, SSPA advocates for the safety and happiness of young patients while learning and having fun along the way. The purpose of our newsletter is to educate pharmacy students about pediatric pharmacy and advocate for pediatric patients within the University of Georgia College of Pharmacy.















