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ADHD (G KULKARNI, SECTION EDITOR)

Attention Deficit Hyperactivity Disorder and Its Treatment in Geriatrics

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Abstract

Purpose of Review The main purpose of this review is to understand how attention deficit hyperactivity disorder (ADHD) affects geriatrics (elderly population).

Recent Findings ADHD is a common neuropsychiatric condition, which is not well studied in geriatrics. Current literature does not have too much information on effects of ADHD in geriatrics. ADHD in elderly population is accompanied by various comorbidities such as anxiety and depression.

Summary This review will provide an overview of existing literature on prevalence of ADHD in elderly population along with the comorbidities and available treatment options for the same.

Keywords ADHD · Attention deficit hyperactivity disorder · Geriatrics · Elderly patients

Introduction

What Is Attention Deficit Hyperactivity Disorder (ADHD)?

Attention deficit hyperactivity disorder (ADHD) is a neurological developmental disorder, which is usually inherited. Patients suffering from ADHD have lack of concentration, impulsiveness and restlessness [1–3].

ADHD typically has an onset before age 12 years. It has been reported that the worldwide prevalence of ADHD is around 5.0% among children and 4.4% among adults [4]. The symptoms of ADHD continue to appear during adulthood According to the *Diagnostic and Statistical Manual of Mental Disorders*, 5th Edition (DSM-5), the three main symptoms of ADHD are hyperactivity, impulsivity, and inattention [5••]. Hyperactivity may appear as nervousness, inner restlessness, fidgeting, and talkativeness. Many times, it is compensated by extreme physical activity. Impulsivity leads to binge eating, impulsive driving, impulsive purchases, difficulty waiting in line, etc. Inattention is described as distractions, difficulty making decisions and finishing tasks, procrastination, etc. [6••]. Although the impulsivity and hyperactivity tend to diminish during adulthood, the inattention tends to continue [7, 8].

Prevalence of ADHD in Elderly Patients

The symptoms of ADHD endure into adulthood for at least two-third of the patients who were diagnosed with ADHD in childhood [9]. The prevalence of ADHD among elderly adults has become an important issue as many of the adults aged 50 years and older have been seeking evaluation for ADHD for the very first time. The exact prevalence of ADHD in adults (50 years or older) is not well defined yet [10••].

In current literature, very few studies have reported the prevalence of ADHD in elderly patients. In a Dutch epidemiological study by Kooij JJ et al., 1813 participants in the age group of 18–75 years were evaluated. Around 50% of the participants in this study were older than 45 years, and this study reported that self-reported prevalence of ADHD was around 1.0–2.5% and there were not any signs of decline of symptoms in elderly patients [11]. In 2012, Michielsen M et al. investigated 1494 elderly patients in the age group of 60–94 years in the Dutch Longitudinal Aging Study

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Amsterdam (LASA) study. This study reported that the prevalence of syndromatic ADHD in elderly patients was around 2.8% and the prevalence of symptomatic ADHD was 4.2%. Moreover, the symptoms of ADHD were similar in both male and female patients [12•]. In addition, the findings from the Dutch LASA study also reported that younger elderly participants (60–70 years) had more ADHD symptoms compared with the participants in the oldest group (71–94 years) [12]. It has been also reported by Das D et al. (the Australian PATH Through Life project) that elderly adults (68–74 years) have significantly lower levels of ADHD symptoms (measured by Adult ADHD Self-Report Scale (ASRS)-screener score) compared with the middle-aged adult group (48–52 years) [13••]. This study also reported that compared with 6.2% adults in the middle-aged group, around 2.2% of the older-age adults met the recommended cut-off for the ASRS-screener score, which has been associated to a clinical diagnosis of ADHD [13••].

In a Swedish population-based study by Guldberg-Kjar T et al., the prevalence rate of self-rated childhood ADHD was 3.3% among 2500 participants in the age group of 65–80 years [14•]. However, it is important to note here that this study was performed based on recalling ADHD symptoms that occurred 50–70 years ago. Hence, there is a possibility of under- as well as overestimation of the symptoms. Table 1 provides the details of available studies on prevalence of ADHD in elderly population.

Impact of ADHD in Elderly Population

Symptoms and Comorbidities Associated With ADHD in Geriatrics

In the LASA study, Michielsen M et al. reported that the diagnosis of ADHD diagnosis and ADHD symptoms among elderly population were associated with anxiety (8% of times) and depressive symptoms (17% of times) [15••]. Moreover, 26% of the elderly participants with ADHD reported both anxiety and depressive symptoms. This study also reported that individuals with ADHD had more depressive and anxiety symptoms compared with the individuals without ADHD [15]. The Australian PATH Through Life project study has noted that the rate of comorbid depressive symptoms was 8% among elderly participants (68–74 years) with ADHD [13], and it was a stronger predictor of poorer cognitive performance than in younger participants (48–52 years) with ADHD [13]. Semeijn EJ et al. [16, 17] reported that the risk of depression in elderly population with ADHD was partially explicated by severe conflicts and adverse life events. This study also reported that decline in cognitive functioning was due to depressive symptoms. One study from Norway in adults (50 years or older) with ADHD found that 46.7% of the participants had psychiatric comorbidity, 36.7% had depression, 26.5% had anxiety, and 24.5% reported to have bipolar disorder [18••]. In a study by Brod M et al., out of 27 participants with ADHD, 8% had bipolar disorder, 42% had anxiety, 54% had depression, and 63% had other psychiatric conditions [19]. In summary, the prevalence rate comorbid depression and anxiety was found to be highly variable in geriatrics depending on study design and the participants. However, it is likely that comorbid depression contributes to cognitive decline in this population.

Various studies have reported an association between somatic diseases and ADHD in children, adolescence, and young adults, for example, allergy, asthma, obesity, and musculoskeletal pain [20–22]. However, the association between somatic diseases and ADHD in elderly population is not well-understood. In a study by Lensing et al., 149 adults (50 years or older) with ADHD were included. Out of these149 participants, 46.6% of the participants had complained about having somatic diseases [18••]. The most commonly occurring somatic diseases in this study were hypothyroidism (20.6%), hypertension (19.1%), fibromyalgia (16.2%), and arthritis (16.2%). In addition to somatic diseases, 73.7% participants were suffering from moderate-to-severe pain/discomfort. Another study with a smaller sample size of 11 patients (mean age: 61.6 years) has reported that 55% patients were suffering from somatic diseases such as diabetes mellitus type 2 (T2DM), hypertension, and ischemic heart disease [23••]. In a recent study by Chen Q et al., where the prevalence of ADHD was found to be 0.29% in participants aged 50 to 64 years, it was reported that the participants had one or more of the following comorbidities: Anxiety, depression, bipolar disorder, T2DM, substance use disorder (SUD), and hypertension [24]. All these studies denote the possibility that ADHD in geriatrics is not only associated with psychiatric, but also physical comorbidities.

Impact of ADHD on Quality of Life in Geriatrics

ADHD in general affects quality of life (QoL) of the patients. Older adults with ADHD (50–69 years) have also reported

Table 1 Summary of prevalence of ADHD in elderly patients

Study by:	Age range	*N*	Prevalence of ADHD
Kooij JJ et al. [11]	18–75 years	1813	1.0–2.5%
Michielsen M et al. [12]	60–94 years	1494	4.0% (60–70 years), 1.1% (71–94 years)
Guldberg-Kjar T et al. [14]	65–80 year	2500	3.3%

worse quality of life compare with the ones without ADHD [18]. So far there are only few qualitative studies that have demonstrated how QoL of geriatric adults get affected due to ADHD. One study, which included 24 older adults (mean age, 66 years) with ADHD, has reported that these elderly participants had lower income due to impulsive spending. These individuals also showed poor work performance and higher social isolation [19]. Another qualitative study by Henry E et al. included 9 older women (62–91 years) with ADHD, which was diagnosed after they turned 60 years old [25•]. This study noted that majority of these elderly women faced peer rejection not only in their past but also in their present lives.

ADHD also affects the psychosocial functioning of geriatric population. It has been reported that older adults suffering from ADHD are more often divorced and report more loneliness compare with the ones without ADHD [14, 26]. In addition, they have an inferior self-esteem, poorer self-efficacy, lower sense of mastery, and greater levels of social incompetence [27••].

Treatment Options for Elderly Patients With ADHD

Along with pharmacological treatment options, other beneficial options such as support group, psycho-education, and cognitive behavior therapy is used to treat elderly patients with ADHD.

Pharmacological Treatments

The first-choice of pharmacological treatment is the stimulants (e.g., methylphenidate and dexamphetamine) for the treatment of ADHD in both children and adults. Second and third choices of pharmacological treatment in adults are atomoxetine and bupropion [28–34]. Stimulants have dosage-related cardiovascular side effects and can increase the heart rate [28]. Hence, in geriatric patients, it is recommended to start medications at a lower dosage [35] and then gradually increase the dose to achieve the optimal dose.

Methylphenidate Till today there are not any large randomized controlled trials (RCTs) to investigate the safety and efficacy of stimulants in geriatrics; however, methylphenidate has been used to treat depression and dementia in elderly patients [10]. Few case studies have reported beneficial effects of stimulants in elderly patients with ADHD. In a case study by Da Silva et al., a 67-year-old woman with attention deficit disorder (ADD) reported improvement in concentration and her daily activities following the treatment with three daily doses of methylphenidate (10 mg) [36••]. Another case study reported similar outcomes in a 55-year-old male patient with ADHD treated with the same dose of methylphenidate. In a pilot study by Manor I et al., 11 elderly patients (56–70 year old) with ADHD were treated with different (from 50 to 108 mg/day) daily doses of methylphenidate [23]. And these patients had similar beneficial effects as younger adults.

As reported in a RCT, methylphenidate in combination with citalopram for the treatment of depression in 143 elderly patients caused a faster improvement of mood [37]. Methylphenidate has been reported to treat apathy in elderly patients with dementia [38].

Manor I et al. investigated the effects of methylphenidate on 11 middle-aged and elderly patients (55 years or older; mean age, 62 years) with ADHD. Out of 11 patients, 8 patients reported significant improvement on the test of variables of attention [23]. This study reported that these older patients had similar response to methylphenidate as younger patients with ADHD [23]. Brod M et al. [19] investigated the effects of various ADHD medications by telephonic interview with 24 elderly patients (mean age, 66 years) with ADHD. These patients reported that ADHD medications helped them be more organized and focused. In a study by Lensing MB et al. [18], 149 patients with ADHD (mean age, 55.8 years) were examined. Out of these 149 patients, around 64% patients were receiving ADHD medications (methylphenidate or amphetamine). Patients receiving ADHD medications reported to have better attention. This study also reported that the elderly patients were treated with the similar dosage of ADHD medications as younger patients. Table 2 provides a summary of important studies that investigated effects of medications in elderly patients with ADHD.

Dexamphetamine There are not any safety and efficacy studies indicating benefits of dexamphetamine in elderly population with ADHD. No large prospective RCTs were found. One case report on an elderly patient (81 years old) with ADHD reported that the severity of ADHD was reduced following a 4-week treatment with dexamphetamine [6].

Table 2 Pharmacological treatments in elderly patients (50 years or older) with ADHD

Study by:	*N*	Medication used	Outcome
Manor I et al. [23]	11	Methylphenidate	Significant improvements on "attention"
Brod M et al. [19]	24	ADHD medications	Improved organization and focus
Lensing MB et al. [18]	149	Methylphenidate or amphetamine	Better attention

In summary, methylphenidate was found to be equally beneficial in geriatrics in reducing ADHD symptoms as compared with younger population. However, the cardiac risks in elderly tend to be more than younger population, and so this medication should be used with caution. Due to lack of evidence, extreme caution should be used while using other stimulant medications in geriatrics.

Support Group

Support groups may be helpful for elderly patients with ADHD. Support groups help for common identification of lifetime symptoms of ADHD and are frequently very beneficial to decrease stigma and self-blame [39].

Psychoeducation

Psychoeducation on ADHD helps patients and their families understand the impact of ADHD. It includes the details such as possible symptoms, impairment, comorbidities, brain dysfunctions, and treatment strategy. This information helps the patients to understand the future difficulties as well. This may also help to improve their daily activities [39].

Coaching/Cognitive Behavior Therapy

For patients with ADHD, coaching plays a vital role along with pharmacological treatment. During coaching, general problems that occur due to ADHD such as anxiety, insomnia, depression, and low self-esteem are discussed. In addition, discussions on loneliness, financial problems, relationship problems, acceptance of the diagnosis, etc. at older age are also done. Coaching can be conducted individually, in a group, or online. The main advantage of coaching is that patients get support from other individuals with similar experiences. Coaching includes development of useful skills such as organization, planning, setting goals, and dealing with distractions. Cognitive behavior therapy is recommended in patients with low self-esteem and negative experiences caused because of failure or reckless behavior [39].

Due to the very limited literature available on pharmacological treatments of ADHD in geriatrics and the possible side effects risk involved, it makes sense to try coaching and psychoeducation tools first before considering the medication option.

Summary

ADHD in geriatrics tend to be less common than in children. It could be due to either ADHD gets better as patients age or they may be learning necessary coping skills over the years to the extent of not meeting diagnostic criteria. Regardless of that, ADHD carries significant psychiatric and physical comorbidities and nevertheless affects geriatric QoL. So, it remains necessary to provide required support to elderly patients with ADHD by understanding how ADHD symptoms have affected their overall health, functioning, and QoL. Old age comes with its own challenges such as decreased vigor and vitality, declining physical health, and increasing uncertainties, loneliness, and limited social support. In such conditions, any comorbidities such as ADHD can further significantly impact this vulnerable population. Early identification and treatment therefore should not be delayed, and personalized treatment should be considered to each elderly patient based on his/her symptoms.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflicts of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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