

## Association of ADHD Symptoms Severity with Higher Paternal and Lower Maternal Age of A Clinical Sample of Children

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**Abstract-** This study examines the association of father's and mother's age with the severity of inattention and hyperactivity/impulsivity. Participants are 470 children with attention deficit hyperactivity disorder (ADHD) diagnosed according to DSM-IV diagnostic criteria. Moreover, parents reported the severity of ADHD symptoms through completing ADHD checklist. Mother's and father's age was associated with the score of hyperactivity/impulsivity. Lower father's age and advanced maternal age are associated with higher severity of hyperactivity/impulsivity in children and adolescents with ADHD. None of mothers' and fathers' age is associated with ADHD inattentiveness severity in children. Maternal and paternal education levels are not associated with ADHD severity. Older mothers and younger fathers have ADHD children with higher hyperactivity/impulsivity severity. It should be investigated whether the father's and mother's age are risk factors for ADHD.

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**Keywords:** Attention deficit disorder with hyperactivity; Parents, Father; Mother, Age Distribution; Child, Educational status

### Introduction

Attention deficit hyperactivity disorder (ADHD) is a very common psychiatric disorder in clinical samples. The rate of its symptoms in the community is up to 10.1% (1). ADHD has two main categories of symptoms including inattentiveness and hyperactivity/impulsivity. This disorder is associated with impairment in the social, academic, adaptive, and occupational aspect of life. ADHD is a familial disorder. However, its etiology is not clearly known (2, 3). Environmental and some other risk factors such as maternal self-perceived distress are involved (2, 3). The symptoms of ADHD are found in early childhood at the ages less than seven year. Therefore, birth risk factors are widely researched.

Recently, there has been an increasing interest to the possible association of parental age with the neuro-developmental disorder of autism. Higher maternal and paternal age are reported for children with autism (4). Moreover, parental age is a risk factor for autism in the community sample of children (5).

Advanced paternal age significantly increases the

risk of adverse 'externalizing' behaviours" in seven year old children (6). While advanced paternal age is associated with poorer neuro-cognitive function in infancy and childhood, advanced maternal age is associated with a better neuro-cognitive function in infancy and childhood (7). However, others reported that this negative impact of paternal age on neurocognition may be related to maternal educational level. Controlling for the maternal educational level offset the association of advanced paternal age and neuro-cognitive function of children (8).

The association of paternal age and ADHD is rarely studied. There is a report that the age distribution of fathers of children with ADHD is not different from the community sample (9). However, we could not find more studies about this matter. In addition, no study was found investigated the possible association of maternal age distribution and ADHD.

This study examines whether parental age is in association with the severity of inattentiveness and hyperactivity/impulsivity in children and adolescents with ADHD.

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## Parental age and ADHD

The clinical sample of ADHD is usually co-morbid with other psychiatric disorders. About 59% of them have oppositional defiant disorder (10). Separation anxiety disorder is also commonly reported in the clinical samples of children with ADHD (10). Male gender, low maternal and paternal educational level are a risk factor for ADHD (11). Therefore, gender, paternal and maternal educational level, the co-occurrence of oppositional behaviors and anxiety symptoms are considered as covariate factors.

## Materials and Methods

The participants of this study are a clinical sample of 470 children and adolescents with ADHD. They are referrals to a Child and Adolescents Psychiatry Clinic affiliated with Shiraz University of Medical Sciences. This is a data re-analysis of an ongoing study about ADHD (12).

The children and at least one of their parents were interviewed face to face. Psychiatric diagnosis was made according to the diagnostic criteria of Diagnostic and Statistical Manual of Mental Disorders-Text Revised (DSM-IV) (13).

## Statistical analysis

SPSS for windows was used for statistical analysis. Two separate linear regression analyses tests, backward method, were used to examine whether the father's and mother's age is associated with the severity of inattentiveness and hyperactivity/impulsivity scores in children with ADHD. The variables of gender of

children, father's educational level, mother's educational level, the co-morbidity of oppositional behavior symptoms, and separation anxiety symptoms were considered as covariate factors. P value less than 0.05 was set as statistical significance.

## Results

470 children and adolescents with ADHD are included in this study. 358 (76.2%) of them were boys. Their age range was 5 to 17 years old. The mean of age and its standard deviation was 9.0 and 2.3 years, respectively.

The distribution of paternal and maternal age of children with ADHD and general population are displayed in Table 1. The age range of father's in the ADHD groups was from 25 to 59 years. Their mean years of age was 39.6(SD=5.6). The age range of mothers of children with ADHD was from 25 to 52. Their mean years of age was 33.3(SD=5.0).

Linear regression analysis showed that father's age and the age of children with ADHD are negatively in association with hyperactivity/impulsivity score (Table 1). It also showed that mother's age, oppositional behavior score, and separation anxiety score are significantly associated with hyperactivity/impulsivity score.

Second linear regression analysis showed that none of father's and mother's age was significantly associated with inattentiveness score in children and adolescents with ADHD (Table 2).

**Table 1.** The association of father's and mother's age with the severity of parent-reported hyperactivity/impulsivity in children with ADHD.

Variable	Beta	Significance	95.0% Confidence Interval for Beta	
			Lower bound	Upper bound
Father age	-0.14	0.01	-0.26	-0.03
Mother age	0.12	0.02	0.01	0.27
Age	-0.23	0.001	-0.79	-0.38
Oppositional behavior score	0.54	0.001	0.45	0.62
Separation anxiety score	0.16	0.001	0.07	0.25

**Table 2.** The association of father's and mother's age with the severity of parent-reported inattentiveness in children with ADHD.

Variable	Beta	Significance	95.0% Confidence Interval for Beta	
			Lower bound	Upper bound
Age	0.14	0.001	0.11	0.46
Oppositional behavior score	0.28	0.001	0.17	0.33
Separation anxiety score	0.08	0.07	-0.007	0.16

Father's and mother's age were not associated with the severity of parent-reported inattentiveness.

## Discussion

The aim of this study was to examine whether parental age is associated the severity of inattention and hyperactivity/impulsivity in children with ADHD. Current results supports that both father's and mother's age are associated with the severity of hyperactivity/impulsivity. However, none of them was in association with the inattention severity. It shows that the higher age of mothers and the lower age of fathers are associated with higher hyperactivity/impulsivity. No previous published study was found investigated this association to be compared with us.

If future studies confirm these associations, it should investigate whether the father's and mother's age are risk factors for ADHD.

This is a cross-sectional study. Therefore, a cause and effect relationship cannot be investigated. Moreover, this study included a clinical sample of children and adolescents. Therefore, the generalization of the results to community samples or other clinics is not guaranteed. There are many risk factors for the neuro-developmental disorder should be considered such as labor characteristics, low birth weight, and prematurity. This study compared parental age distribution between ADHD group and general population. Further studies may include the parents of children without ADHD as a control group.

Despite these limitations, this study included a large sample of children with ADHD. The diagnoses were made using DSM-IV diagnostic criteria. In addition, some covariate factors were included in the analysis.

In conclusion, lower father's age and higher mother's age are associated with higher hyperactivity/impulsivity in children and adolescents with ADHD.

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