

# Association and Risk of Autism in Relation to Parental Age (40 Years)

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## ABSTRACT

**Aim:** To determine and evaluate the parental age as an important risk factor for autism

**Study Design:** Case control study

**Place and duration of study:** 6 months duration study (from first June 2013 till first December 2013) at WAPDA teaching hospital Ferozepur road Lahore and Asadpaediatrics and eye care clinic Faisal town Lahore.

**Methodology:** In this study parents of 100 cases (diagnosed patients with autism) and parents 100 controls (healthy children) were taken using non-probability convenience sampling. In this study there were 77 male and 23 female patients with male to female ratio 3.35:1. The mean age of all patients was  $7.80 \pm 3.71$  in which the mean age of boys and girls was  $7.42 \pm 3.60$  years and  $9.13 \pm 3.77$  years respectively. History was taken about the age of parents at the time of birth of child (age and sex matched) from both case and control group and data was recorded on a specified questionnaire form.

**Results:** The mean age of all patients was  $7.80 \pm 3.71$  in which the mean age of boys and girls was  $7.42 \pm 3.60$  years and  $9.13 \pm 3.77$  years respectively. There were 3.907 times chances to have autistic child if mother's age is  $\geq 40$  years and there were 3.50 times more chances to have autistic child if father's age is  $\geq 40$  years at the time of offspring conception. Moreover if both mothers and father's age is  $\geq 40$  years there are 4.42 times more chances to have autistic child at the time of offspring conception. On concluding remarks as age of mother and father increases, there is higher risk of autism of children.

**Key words:** Neurodevelopment, Autism, maternal and paternal age, odds ratio

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## INTRODUCTION

Autism is described by deficiency in verbal communication, limited and monotonous patterns of interests, behavior and impairment of social interaction<sup>1</sup>. It is a lifelong, multifaceted and poor neurodevelopment disorder of mainly unknown conditions. Nevertheless no consistently identified factors have been shown and factors associated with autism may be nonspecific<sup>2</sup>.

Its prevalence is increasingly day by day following mental retardation<sup>3</sup> the statistics show its frequency 1% of the population<sup>4</sup>. It is estimated that frequency of autism is 3 times higher in males when compared to females<sup>5</sup>. The major cause of autism is not well recognized; however, it is evident from findings of family and twins studies that genetics<sup>6</sup> play an important role for autism along with some environmental risk factors<sup>7</sup>. Another important etiological factor is related to autism is maternal and paternal advanced age<sup>8</sup>. Some epidemiological data

reported that Autism is associated when parent's age is over 40 years<sup>9</sup>. Although a lot of researchers has been done to prove role of parent's advanced age for autism but local data is limited so we decided this study was to see association between parental age and autism.

## MATERIALS AND METHODS

This case controls study was conducted at department of Pediatrics Wapda Hospital Lahore. Non-probability convenience sampling was used. This study was completed in 3 months. 100 cases and 100 controls were taken in this study

**Cases:** Diagnosed autistic children [their parents were asked about their age at the time of conception of their autistic children]

**Controls:** Healthy children [their parents were asked about their age at the time of conception their healthy children]

All cases and controls aged  $\leq 14$  years of age of either gender were taken. Females with previously diagnosed gestational DM (diabetes mellitus) and hypertensive disorders at the time of their conception of autistic child were excluded.

After meeting inclusion criteria a total 200 (100 cases and 100 controls) were taken from the department of Pediatrics WAPDA hospital and Asad

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eye and paediatrics care clinic Lahore..After taking informed consent form from parents their demographic details were taken. They were requested to provide information regarding their ages [both maternal and paternal] at the time of their children's conception (for both cases and controls). All collected information was entered and analyzed using SPSS 22. Quantitative variables like age presented in form of mean±S. D. Frequency(%) was used for different age groups. Data was further analyzed using Odds ratio to calculate the risk and chi-square test was applied to see association in parent's age (≥ 40 years, < 40 years) and Autism.

## RESULTS

In this study there were 77 male and 23 female patients with male to female ratio 3.35:1. The mean age of all patients was 7.80±3.71 in which the mean

age of boys and girls was 7.42±3.60 years and 9.13±3.77 years respectively. Most of the patients were 3-10 years old at the age of presentation. The mean age of mother's and father's of cases was 38±7.22 years and 43.2±7.85 years respectively, while the mean age of mother's and father's of controls was 30.6±7.85 years and 36.7±7.86 years. There were 14 mothers of cases and 4 mothers of controls with age ≥40 years while there were 40 fathers of cases and 16 fathers of controls with age ≥ 40 years. There were 3.907 times chances to have autistic child if mother's age is ≥ 40 years and there were 3.50 times more chances to have autistic child if father's age is ≥ 40 years at the time of offspring conception. Moreover if both mothers and father's age is ≥40 years there are 4.42 times more chances to have autistic child at the time of offspring conception.

Table 1: Descriptive statistics of age of children

Age Category	Boys	Girls	Total
<3	13	2	15
3-5	31	6	37
5-10	26	9	35
>10	10	6	16
Total	77	23	100
Mean age	7.42 ± 3.60	9.13 ± 3.77	7.80 ± 3.71

Male to female ratio = 3.35:1

Table 2: Age of parents in cases and control groups

Age	Mother's age		Father's age		Both mothers and Fathers	
	Cases	Control	Cases	Control	Cases	Control
≥ 40 years	14	4	40	16	22	6
< 40 years	86	96	60	84	78	94
Odds Ratio	3.907 [1.239 – 12.32]		3.50 [1.795 – 6.82]		4.42 [1.71 – 11.44]	

## DISCUSSION

According to Lisa A, reported that advanced maternal age is linked with autistic child but this relationship is not proved yet<sup>10,11</sup>. Limitation regarding methodologies, for paternal age lack of statistical control, birth order and parity may pose potential role as a confounder have made these statistics difficult to understand. The role of paternal age has been proven for adverse reproductive and fetal outcomes, such as fetal death, miscarriage, malignancy in children, neuro and motor related disorders<sup>10,12,13</sup>.

One more study reported higher male to female ratio in autism they reported that the male to female ratio in their study was males: females = 4.6:1, and there was higher risk for autistic children with advanced age of both mother and father.<sup>11</sup> They reported that when father's age was more than 40 years then there were 1.36 (1.26–1.47) chances for autism as compared to control subjects.<sup>11</sup> One

more recent study showed that when mother's age increases 30 there are higher risk to have autistic child, there is 1.75 [1.63-1.89] times more chances especially in mother's age group of 40-45. For father's age odds ratio is reported 1.39 [1.29-1.50] for ages 55-59 was<sup>14</sup>. There is more evidence to support our statistical findings; there was a statistically significant monotonic relationship and 5.75 times higher risk between father's age (≥ 40 years) and risk of Autism<sup>15</sup>.

We in this study also found similar trend and higher to have autistic child when mothers and father ages are ≥ 40 years. The findings of current study also suggest that there were 3.907 times chances to have autistic child if mother's age is ≥ 40 years and there were 3.50 times more chances to have autistic child if father's age is ≥ 40 years at the time of offspring conception. Moreover if both mothers and father's age is ≥ 40 years there are 4.42 times more chances to have autistic child at the time of offspring

conception. Our findings show higher risk and association between advanced age and autism. The limitation of this study was lower sample size and not to control other risk factors for autism such as environmental and genetic factors that may boost up the association of Autism and advanced maternal age.

## CONCLUSION

According to findings of our study it is proved that there is positive association and higher risk to have autism when maternal, paternal or both have increased age ( $\geq 40$  years).

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