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## Effect of advanced parental age on the birth of the child with mental retardation

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### Abstract

The study was conducted on 80 mentally retarded children (boys as well as girls, especially with mental retardation along with Autism and/or ADHD, cerebral palsy, Down syndrome etc.) between ages 6-14 year with an objective to track the various reasons behind mental retardation. All the children studied were going to special schools indicating their lower IQs (less than 70). The data was collected with the help of a questionnaire formed. The information was collected from the mothers or caretakers of the children included; after signing the consent letter. The questionnaire consisted of questions related to the background data such as child's age, name, gender, diagnosis, parental age, parents' educational as well as economical status, addiction in family, mother's health and environmental conditions during pregnancy etc, it also consisted of the food habits and three day diet recall of the child. The collected data was coded and then analysed using SPSS package. Various results were obtained such as iron deficiency and malnourishment in the children studied, near significant difference between addiction in family and child being mentally retarded etc. But, significant results were observed in case of advanced parental age and child being mentally retarded having p values less than 0.05 supporting the effect of advanced parental age on the birth of the child with mental retardation.

As the study was related to mentally retarded children, this study has gone through ETHICAL Clearance.

**Keywords:** Advanced parental age, mental retardation, down syndrome, cerebral palsy, effect, significant difference

### Introduction

Mental retardation is a developmental disability that first appears in children under the age of 18. It is defined as an intellectual functioning level (as measured by standard tests for intelligence quotient i.e. IQ) that is well below average and significant limitations in daily living skills (adaptive functioning). [https://www.health of children.com>mental-retardation].

Data obtained from various sources indicate that the prevalence of mental retardation is about 20 per 1000 general population. There are reportedly many known reasons behind mental-retardation, advanced parental age is one of them.

### Inter-relationship between parental age and mental retardation

There is currently a pronounced trend towards delayed childbearing across most of the developed countries. Significant complications for the fetus have been reported with increasing maternal age, including chromosomal abnormalities, congenital abnormalities, both macrosomia and low birth weight and Perinatal mortality <sup>[1]</sup>.

Researchers say the number of births to parents over age 35 has more than doubled in the last 20 years and this has raised questions about the role of paternal age in the risk of genetic abnormalities and birth defects <sup>[2]</sup>.

Previous studies have shown that the risk of a woman having a baby with Down syndrome rises dramatically after she reaches 35. Although this effect of maternal age on Down syndrome risk is well known, researchers say the influence of the father's age on Down syndrome has not yet been defined. Some studies have found no relationship, while other, smaller studies have suggested that older fathers may raise the risk of Down syndrome <sup>[2]</sup>.

Researchers found that the rate of Down syndrome among parents over 40 was 60 per 10,000 births, which is six times higher than the rate found among couples under 35 years old. Older fathers over 40 had twice the rate of Down syndrome births compared with men 24 years old

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and younger when they had children with women over 35 [2]. Researchers at INSERM, France's national medical research agency, studied 11 535 pregnancies resulting from artificial inseminations carried out at 22 fertility clinics across France. They divided the pregnancies into three groups according to the age of the sperm donor, and then calculated the percentage of Down's babies born in each group. The preliminary results, which are unpublished, show that 0.14 per cent of the children born to fathers under 35 had Down's syndrome, compared with 0.23 per cent of babies born to men aged between 35 and 39, and 0.41 per cent born to men over 39 – an almost threefold increase over those in the youngest age group [3].

From 1983 to 1997 a dramatic increase in the number of infants born to parents 35 years or older was observed. During the 15-year study period there was an increase of 111% and 60% in the number of mothers and fathers 35 years old or older, respectively. There was no parental age influence on Down syndrome until age 35 years and older. A paternal age effect was seen in association with a maternal age of 35 years and older, and it was most pronounced when maternal age was 40 years and older ( $p = 0.0004$ ). In this later maternal age group the paternal contribution to Down syndrome was 50% [4].

Mentally retarded patients born to mothers' of age >30 were more in moderate and severe group Several studies have noted that the age related risk of trisomy 21 does not continue to increase exponentially with increasing age for women of 45 years of age or over (Ferguson-smith and Yates, 1984). The highest advanced maternal age (AMA) fractions occurred among Asian/pacific Islanders, followed by non Hispanic Caucasians Blacks and Hispanics and Native Americans. Advanced maternal age effect was observed among the patients with developmental disabilities (Drews *et al*, 1995). Patients of mild mental retardation cases were found to be associated with increased maternal age (Lisa *et al*, 2001) [6].

In a systematic review of risk factors in term CP (cerebral palsy), an association with both young maternal age (less than 20 years) and advanced maternal age (greater than 40 years) was found [7].

All of the above studies are supporting the effect of advanced parental age over the birth of the mentally retarded child.

## Methods

1. Study was conducted on 80 mentally retarded children (both boys as well as girls especially with Down - syndrome, cerebral palsy, Autism and ADHD having IQs less than 70) between ages 6-14 years. The duration of data collection was from June 2018 to April 2019 when these children were studying at special schools in Chembur, Deonar, Govandi and Tilaknagar areas in Mumbai, India . The children studied were residing in nearby areas in Mumbai, India and were from lower socio economic strata. The data was collected from the mothers or care takers of these children with the help of a questionnaire formed. At the time of appointment at the respective school, the parents were firstly given a clear idea about this study and then the consent letter was signed by the parents and after that the questionnaire was asked to get the required information.
2. The questionnaire was including the questions related to the background data like name, age, gender, diagnosis of the child, age of the parents, educational and economical status of the parents, eating habits and three day diet recall of the child etc.
3. The collected data was coded and then analysed using SPSS package.

## Results and Discussions

This study included (n=80) special children or mentally retarded children (both boys and girls especially with Down syndrome, cerebral palsy, Autism and ADHD). The age group selected for the subjects was in the range 6-14 years. All these children were coming from joint as well as nuclear families and from lower economic strata. Most of these children were malnourished having height, weight and BMI below the average values for their age and dietary iron consumption was found to be very low.

Among all the 80 families considered in this study, 41% families were having addiction like tobacco chewing, smoking and alcohol consumption and 35% mothers were reported to be malnourished at the time of pregnancy. A near significant difference was observed between addiction in the family and child being mentally retarded, also a near significant difference was observed between maternal malnutrition during pregnancy and child being mentally disabled.

**Table 1:** Significant difference Co-relation was observed between advanced parental age and child being mentally retarded. (Especially, with Down syndrome or cerebral palsy)

Sr. No.	Significant Difference Between	Pearson Chi-Square Test Significance (p value)
1	Age of the father & child with Down Syndrome	0.000
2	Age of both the parents & child with Down Syndrome	0.030
3	Age of both the parents & child with Mental Retardation	0.001
4	Age of both the parents & child with Cerebral palsy along with Mental retardation	0.049

1. A significant difference between age of the father of the child and the child with Down syndrome was observed as the p value occurred to be 0.00 which is less than 0.001, which means if the age of the father at the birth of the baby is above 40 years, then more is the risk of the child having Down syndrome. An article published in WebMD Health News from journal of urology, June 2003 named 'Dad's Age Raises Down Syndrome Risk, Too-Combined Effect of Older Mothers and Fathers Increases Baby's Risk' by Jennifer Warner and also an article published in the magazine New Scientist on 22<sup>nd</sup> July 1995 named 'Ageing sperm linked to Down's syndrome

by Tara Patel both are supporting this result [2, 3].

2. Also, a significant difference between age of both the parents of the child and the child with Down syndrome was observed, as p value occurred to be 0.03 which is less than 0.05. That means if the age of both the parents (at the time of the birth of child) is more (above 35-40 years), then there is a risk of the child having Down – syndrome.

But in the study done in North West Spain; near significant correlation was obtained between age of the parent and the child with Down- syndrome [8]

The study, Association of Parental Age and the Type of Down Syndrome on the Territory of Bosnia and Herzegovina. by Sotonica M, Mackic-Djurovic M, Hasic S, Kiseljakovic E, Jadric R, Ibrulj S *et al.* and again the study, The influence of paternal age on down syndrome done by Fisch H, Hyun G, Golden R, Hensle TW, Olsson CA, Liberson GL *et al.* both are supporting this result [9, 4].

3. Similarly, a significant difference between age of both the parent and the child with mental retardation was obtained, as p value occurred to be 0.001 which is less than 0.05. That means, if the age of both the parents (at the time of birth of the child) is more (above 35-40 years) there is a risk of the child having mental retardation.

The study named 'The Effect of Paternal Age on Offspring Intelligence and Personality when Controlling for Parental Trait Levels' by Ruben C. Arslan, Lars Penke, Wendy Johnson, William G. Iacono, and Matt McGue doesn't support this result but the study, named Study of Maternal Age, Family History of Mental Retardation, Consanguinity in Mental Retardation (Various Risk Factors in Mental Retardation) Minakshi Vashist and Ritu Yadav supports that advanced maternal age has relation with developmental disabilities in children [5, 6].

4. A significant difference between age of both the parents and the child with cerebral palsy along with mental retardation also was obtained, as p value occurred to be 0.049 which is less than 0.05 that means, if age of both the parents (at the birth of the child) is more (above 35-40 years), there is a risk of the child having cerebral palsy along with mental retardation.

The study named 'A systematic review of risk factors for cerebral palsy in children at term in developed countries' done by Sarah McIntyre, David Taitz, John Keogh, Shona Goldsmith, Nadia Badawi, Eve Blair *et al.* and 'Variation in the influence of selected sociodemographic risk factors for mental retardation.' By Drews CD, Yearging-Allsopp M, Deecoufle P, Murphy CC. both are supporting that advanced maternal age has association with child with mental retardation along with cerebral palsy [7, 10].

## Conclusion

1. This study showed significant correlation between advanced parental age and the birth of a mentally retarded child. It can be concluded that, advanced parental age has an effect on the birth of the child with mental retardation. Proper counseling is advised for the parents of later ages (above 35-40 years of age) while going into matrimony. Government policies should be grafted in this kind of cases to avoid birth of mentally retarded child.

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