

Abortion Rates in Women of Children with Trisomy 21-Down's Syndrome

M. Sujatha, G. Madhusudana Reddy, Uma Devi, C. Kusuma Kumari
Clinical Genetics Section and Cytogenetics Section, Inst. of Genetics,
Hospital for Genetic Diseases, Osmania University, Begumpet, Hyderabad – 500 016. (A.P.).

Summary: Abortion rate in 908 mothers with Trisomy 21 Down's Syndrome Children were analysed. The abortion rate in these women was compared with reproductive history of 1000 consecutive women who delivered in a local maternity hospital. The rate of abortion was found to be significantly high i.e. 16.7% in women who had given birth to trisomy 21 Down's Syndrome child when compared with women from control group who had an abortion rate of 3.7%.

Women were grouped into four categories depending on the age namely less than 19 years (Group I) between 20-24 years (Group II) between 25-35 years (Group III) and women aged more than 35 years (Group IV) at the time of birth of the affected child. The rate of abortion was 30.4%, 14%, 16.7% and 14.4% respectively in the four categories of women of children with 21 trisomy Down's Syndrome. The rate was high when compared with controls i.e. 2.8%, 1.6%, 5.3% and 6.3% in all the four groups.

The significant finding observed was the high rate of abortion in the group under study among women who were less than 19 years of age. The above observations confirm that women who give birth to babies with Trisomy 21 Down's Syndrome have a higher rate of spontaneous abortion than control groups probably due to increased production of trisomic conceptuses which are expected to be aborted. It was also observed that the total number of abortions in the study group was more before the birth of a child with Down's Syndrome. Hence women with a history of abortion form a high risk group for giving birth to a child with Down's Syndrome. This makes it mandatory to conduct antenatal screening and diagnostic tests for detection of Trisomy 21 Down's Syndrome in these women.

Introduction

Incidence of Down's Syndrome is almost the same in India compared to Western Countries i.e. 1 in 600 to 1 in 800 live births. Irrespective of maternal age we have been observing the birth of Down's Syndrome Children in younger women and there has been an increased demand for prenatal diagnosis in our genetic clinic. This has prompted us to identify the risk factors in women who give birth to Down's Syndrome Children.

There is now evidence that women with a live born child with trisomy 21 have an increased risk of having another live born child with either the same or different trisomy particularly when a woman is under 30 years when first the affected child is born. (Carter & Evans 1961, Richards 1977). This observation has been confirmed by Mikkelsen and Stene (1979) using data from the European

collaborative prenatal diagnostic study. They have observed that in women under 24 years at the time of birth of a child with Down's Syndrome had six times the number of affected pregnancies expected. Several investigators have analysed the abortion rate in mothers who had delivered children with Trisomy 21 Down's Syndrome but results of these studies were inconclusive (Smith & Record 1955; Mc Donald 1972). We therefore decided to use our data of 908 Trisomy 21 cases to evaluate the abortion rates in the mothers of these affected children.

Material and Methods

908 women who had given birth to Trisomy 21 Down's Syndrome Children formed the study group. The reproductive history of these women were recorded. Women were grouped into four different groups

Table-1

Abortion Rates in Study Group and Control Group

	Study Group	Control Group
Total Number of Pregnancies	1648	1568
Total abortions	276 (16.7%)	58 (3.7%)
(P < 0.001)		

depending on the age namely Group I (Women less than 19 years) Group II (Women between 20-24 years) Group III (Women between 25-35 years) and Group IV (Women more than 35 years) at the time of birth of a child with Trisomy 21 Down's Syndrome. Total number of abortions before and after the birth of a child with Trisomy 21 Down's Syndrome were also recorded. The rate of abortions in the study group was compared with the rate of abortions in 1000 women who delivered consecutively in a local maternity hospital. (Control group). Statistical significance was calculated using the chi-square method.

Observation:

Table 1 shows abortion rates in the study group and

control group. The abortion rates are high in the study group when compared with the control group. The increase was statistically significant ($p < 0.001$). Table II shows women of the study group and control group classified according to age, showing total number of pregnancies and abortions. The abortion rate was high in women with children of Trisomy 21 Down's Syndrome (study group) compared with control group in all the four age groups. But it was statistically significant in Group I, II and III. The abortion rate was not significant in women more than 35 years i.e. group IV.

Table III shows the number of abortions in women in the study group before and after the birth of a child with Trisomy 21 Down's Syndrome. The rate of abortions were high before the birth of a child with Trisomy 21 Down's Syndrome rather than after the birth of a child with Trisomy 21 Down's Syndrome which was statistically significant.

Table-II

Women of Study Group and Control Group classified according to age showing total number of pregnancies and abortions.

	Group I (19 years)		Group II (20-24 years)		Group III (25-35 yrs.)		Group IV (35 yrs.)	
	Study Group	Control Group	Study Group	Control Group	Study Group	Control Group	Study Group	Control Group
Total Number of Women	134	131	310	448	394	411	70	10
Total Number of Pregnancies	141	144	469	612	753	765	285	47
Total Number of Abortions	43 (30.4%)	4 (2.8%)	66 (14%)	10 (1.6%)	126 (16.7%)	41 (5.3%)	41 (14.3%)	3 (6.3%)
	(P<0.001)		(P<0.001)		(P<0.001)			

Table-III

Number of Abortions in women in study group before and after the birth of a child with trisomy 21 down's syndrome.

	Group I (19 years)			Group II (20-24 years)			Group III (25-35 years)			Group IV (35 years)		
	Before	After	Total	Before	After	Total	Before	After	Total	Before	After	Total
Number of Abortions	29 (20.5%)	14 (9.9%)	43 (30.4%)	51 (10.8%)	15 (3.2%)	66 (14%)	105 (13.9%)	21 (2.8%)	126 (16.7%)	32 (11.2%)	9 (3.1%)	41 (14.3%)
	(P<0.05)			(P<0.001)			(P<0.001)			(P<0.001)		

Discussions

The overall rate of abortions observed in the study group is significantly more ($P < 0.001$) than that in the control group and also the abortion rate is more in group I & II (women less than 25 years). Lippman et al. 1984 also observed an increased abortion rate in women less than 25 years. From these observations, it appears that women less than 25 years with a history of first trimester abortions are at increased risk of giving birth to a child with Trisomy 21. Hence these women form a high risk group and may need prenatal screening tests.

Acknowledgement

We are thankful to Mr. M. Rajasekher, Research Scholar, Institute of Genetics & Hospital for Genetic Diseases,

Hyderabad for his help rendered in statistical analysis of the data.

References

1. Carter O and Evans K.A., *Lancet* 2 :785;1961.
2. Lippman A., Ayme S., Jr., *Human Genet.* 48: 303; 1984.
3. Mc Donald A. D., *Canad. Med. Assoc. J.* 106: 1085; 1972.
4. Mikkelsen M and Stene J. *Proceedings of the 3rd European Conference on Pre-natal Diagnosis of Genetic Disorders.* Ed. Murken J. D., Stengel-Rutkowski S and Schwinger E., Stuttgart Ferdinand Euke. 22: 1979.
5. Richards B.W. *J. Ment. Defic. Res.* 21: 5;1977.
6. Smith A., and Record R.G. *Brit. J. Prev. Soc. Med.* 9:89; 1955.