poster presentations in cytogenetics

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DOUBLE TRISOMY IN SPONTANEOUS ABORTIONS—AN 11 YEAR REVIEW. HB Al-Kouatly[1], C Johnson[1], D Skupski[2], M Lita Alonso[1]. [1]The New York Presbyterian Hospital-Cornell University, [2]New York Hospital Medical Center of Queens, New York, NY.

OBJECTIVE: To describe the different types of double trisomies diagnosed in spontaneous abortions.

STUDY DESIGN: Retrospective review of spontaneous abortions with double trisomies, 1989-99. Maternal reproductive history was obtained by physician contact and medical record review. Data collection is ongoing.

RESULTS: There were 42 cases of double trisomy; 20 (47.6%) female and 22 (52.4%) male. The mean maternal age was 39.6 years (22-46); the mean paternal age (n=21) was 40.9 years (33-53). The gestational age ranged 5.8 - 10.2 weeks. A fetal pole was seen in 15/25 (60%). The 16 double trisomies cited for the first time in this study were X/6, 3/21, 4/20, 6/8, 7/8, 7/21, 8/19, 8/21, 10/15, 12/21, 13/14, 14/15, 15/18, 15/marker, 16/18, 20/21. Two cases, X/6 and 8/21 were mosaic; one of the 2 cell lines had a single trisomy. The most common double trisomy was 15/21 (4 cases), followed by 15/20 (3 cases). The chromosomes that were trisomic in more than one double trisomy case were: numbers 21 (18 cases), 15 (14 cases), 20 (8 cases), 18 (7 cases), 16 (6 cases), 14 (5 cases), 8, 13, 22 (4 cases each); 6, 7 (three cases each), 17 (2 cases), and 3, 4, 10, 12, 19 (1 case each). Chromosomes 1, 2, 5, 9, and 11 were not found. Assisted reproductive technology was used in 12/33 cases (36%). Gynecologic pathology was seen in 15/28 (53%) of cases. Reproductive history prior to the index pregnancy (n=34), showed 8 liveborn in 7 patients, and 41 spontaneous abortions in 20 patients.

CONCLUSION: Advanced maternal age is associated with double trisomy. Chromosomes 21 and 15 are the most frequently involved chromosomes in double trisomy. The mean maternal age of 39.6 years in double trisomy appears higher than that reported for single trisomy, 31 years. This is the largest reported series of double trisomies in spontaneous abortion specimens. This information can aid in the genetic counseling of patients with spontaneous abortions and advanced maternal age.

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A Case of 46,XX African American male. A. Asamoah[1], V.G. Dev[2], R. Misra[3], O. Onadeko[3], B. Parsh[3], P. Groening[3]. [1]Henry Ford Hospital, Detroit, MI, [2]Genetics Associates, Nashville, TN and [3]Meharry Medical College, Nashville, TN.

We report on a 16-year-old African American male with 46,XX karyotype. He was referred for evaluation because of gynecomastia. A pathology report from a surgically removed undescended testis at 2 years of age showed a left ovotestis. When we saw him, he had a tall thin habitus, female distribution of pubic hair, gynecomastia, and penile abnormality. Molecular methods using primers specific to YP11 locus failed to detect the presence of the SRY gene. Furthermore, using primers specific for the Y-linked and X-linked amelogenin loci showed the presence of only the X-linked amelogenin locus but not he Y-linked amelogenin locus in his genome. Fluorescence in situ hybridization (FISH) indicated the presence of Y material on one of his X-chromosomes. The presence of SRY sequences and other Y chromosome genes in this patient's cell lines of specific tissues might probably be the reason for his phenotype. The findings in this patient suggest the need to use both DNA analysis and FISH methods in studying patients with sex-chromosome abnormalities presenting with unusual phenotypes.

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A family with multiple chromosome anomalies. A.J. Dawson[1,2], D. Riordan[1], A. Vust[1], D. Konkin[1], D.E. Wickstrom[1], C. Prasad[2], and C.R. Greenberg[2]. [1]Cytogenetics Laboratory, [2]Section of Clinical Genetics and Metabolism, HSC, Winnipeg, Manitoba, Canada.

An 18 month male child, JM, was referred to Genetics because of developmental delay and coarse facial features. Chromosome analysis showed a mosaic male karyotype with an unidentified supernumerary ring chromosome in 12% of blood and 27% of skin cells and a normal male karyotype in the remainder. JM's father and uncle were found to be carriers for a balanced translocation inherited from their mother: 46,XY,t(6;22)(p24.1;q12.2)mat. The uncle has a deceased child with 45,X Turner syndrome. The t(6;22) predisposes to 3:1 segregation which may result in liveborn unbalanced offspring with a supernumerary der(22) trisomic for portions of 6p and 22q. FISH analyses of the supernumerary ring in JM were negative with *wcp6* and *wcp2* but positive with *wcp8*, identifying the ring as a pericentromeric derivative of chromosome 8: 47,XY,+r[12]/46,XY[88].ish r(8)(wcp8+). The clinical phenotype in JM is difficult to reconcile with the low percentage of abnormal cells and suggests a significantly higher proportion of partial trisomy 8 cells within the CNS. The presence of three apparently separate chromosome anomalies in this family may reflect either unfortunate coincidence or an undetermined familial predisposition to chromosome rearrangement and aneuploidy.

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Can pericentric inversion and C-heterochromatin cause interchromosomal effect leading to an increased aneuploidy in sperm nuclei? R. Diukman[1], F. Sardos Albertini[2], M. Fejgin[2], A.Shacham[1] and A. Amiel[2]. [1]Prenatal diagnosis unit Carmel Med. Ctr. Haifa, [2]Genetic unit Meir Med. Ctr. Kfar-Saba, Israel.

A 31 years old women underwent amniocentesis because of increased risk for Down syndrome on biochemical screen. Her previous pregnancy ended in a spontaneous abortion.

The Karyotype was 46,XY/47,XY,+21,inv(9) with a mosaicism rate of 45%. The husband, which was known to have oligo-terato-asteno-spermia on semen analysis, had a karyotype 46,XY,inv(9)(q11;13) 9qh+ .

Mono and dual color FISH was applied to his sperm as well as to sperm of normal controls, using centromer probes for 8,9,18,21,X and Y.

In this man with inv9 and 9qh+ the rate of disomy was significantly higher then in normal controls for all probes tested ($p<0.001$).

These findings represent interference in the first meiotic division. The disomy in this man's sperm can be explained by the difference in length of the hetrochromatic region in the two 9 chromosomes. This difference leads to incomplete pairing of chromosomes 9 and may be of the other chromosomes and to disturbance in the meiotic division especially meiosis I.

We assume that the 21 mosaicism might have occurred in the same mechanism.