Three Generations and Six Family Members with a t(13q15q) Chromosome*

Summary. A patient with the clinical features of trisomy 13 without preencephalic defects and with a 46,XX, 15−,t(13q15q) + karyotype is reported. The translocation chromosome was present in five other phenotypically normal family members and could be traced back to the maternal grandfather.

The t(DqDq) Robertsonian translocation is one of the most common translocations that occurs in man (about 1:1000, Hamerton, 1971). Cohen (1971) has compiled 64 cases of t(DqDq) individuals in whom the D group chromosomes composing the translocation have been identified by autoradiography. Forty-nine of the t(DqDq) chromosomes involved numbers 13 and 14, while only six were t(13q15q), five t(13q13q), three t(14q15q), and one t(15q15q). This report presents a family with a t(13q15q) chromosome detected in six individuals and spanning three generations. The aberration was discovered when the patient described below was born and diagnosed as having trisomy D.

Case Report

The proposita was a premature infant, birth weight 2170 g, born to a 30-year-old gravida IV, para III, abortus I, whose prenatal course was unremarkable. Labour and spontaneous delivery were uncomplicated. There had been no history of drug intake, radiology, or illness in the mother throughout gestation. At birth (Fig. 1) the infant was noted to have an ulcerated area in midline of her scalp overlying a bony defect or third fontanelle, a slanted, small forehead with mild microcephaly, enophthalmos, and low set ears. There was a narrow chest with a grade II systolic murmur along the left sternal border, kidneys enlarged to palpation, poor muscle tone with complete head lag (the Moro reflex was normal), rocker-bottom feet, and bilateral simian creases. The laboratory data were non-remarkable.

Chest radiology revealed cardiomegaly but no increased pulmonary vasculature. Skull films showed some thinning of the parietal bone and thinning of the soft tissue overlying the thin portion of the parietal bone; the lumbo sacral spine was normal. Radiology of the hips revealed flaring of both ilia with flattening of both acetabula; there was no dislocation. An intravenous pyelogram showed a normal collecting system in the left kidney without any evidence of obstruction. The right kidney did not opacify nor was a collecting system visualized.

The infant developed jaundice at 24 hours of age with a total bilirubin of 9.1 mg%, (1.2 mg%, direct bilirubin). The maximum value of bilirubin on the third day of life was 10.3 mg% (total) with a direct bilirubin of 1.3 mg%. She had a generalized seizure within the first 48 hours of life associated with a low blood sugar (36 mg%) and normal serum calcium (10.2 mg%). Multiple seizures without hypoglycaemia occurred over the next six days but were then controlled with Dilantin and phenobarbital. Her condition remained stable until she again developed jaundice on the 22nd day of life. This was obstructive in character with a total bilirubin of 7.3 mg% and a direct bilirubin of 4.9 mg%. The haematocrit decreased to 36% six days later. The baby also de-
developed purulent discharge from the left ear from which staphylococci, resistant to penicillin, were cultured.

Her weight increased to 3277 g by the 72nd day of life, but she had difficulty with her feedings because of a poor sucking reflex. On the 73rd day of life she developed aspiration pneumonia and expired on the following day. Permission for a necropsy was denied.

Cytogenetic Studies

The proposita was thought to have an extra D group chromosome because of the clinical findings. Analysis of the chromosome complement revealed a D/D translocation chromosome, and autoradiographic studies indicated that it was composed of the long arms of chromosome numbers 13 and 15 (Fig. 2).

Chromosome analysis of the family (Fig. 3) showed the mother (II.3) to be a balanced t(13q15q) carrier. Subsequent karyotyping of other phenotypically normal family members demonstrated the balanced state in the maternal grandfather (I.1), aunt (II.2), cousin (III.1), and one sister of the proposita (III.2). The grandfather has a sister and a brother who are unavailable for chromosomal studies; both reportedly have phenotypically normal children.

Discussion

Even though the numbers of individuals in the family presented here are small, it is still interesting to compare what has occurred within this family with the findings in other t(DqDq) families. Two recent studies (Hamerton, 1968; Dutrillaux and Lejeune, 1970) have shown that there is no increase in the frequency of miscarriages among progeny of balanced male carriers. This has been the case with the present family. The maternal grandmother (I.2, see Fig. 3) experienced no miscarriages, and the grandfather (I.1) was the carrier.

There was one miscarriage in the balanced female carrier (II.3) in four pregnancies. Dutrillaux and Lejeune (1970) studied 67 families with transmissible t(DqDq) chromosomes and found that 25% of the pregnancies resulted in miscarriages when the female was the translocation carrier. An earlier study (Hamerton, 1968), however, did not find an increase in the frequency of miscarriages among the carrier females.

Hamerton (1968) also demonstrated a significant increase in balanced carriers among offspring of the male carriers; in the present case, both daughters (II.2 and II.3) of the carrier male (I.1) were balanced carriers.
Thus, the mode of inheritance of the D/D translocation chromosome found in the family reported here is quite similar to what has been demonstrated by larger studies.

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References


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Chromosome Nomenclature

The nomenclature of human chromosomes has been standardized by a series of meetings in Denver, London, and Chicago. A report on the most recent meeting of the series which was held in Paris in September 1971 has been published* by the National Foundation of the USA. Authors are now requested to use the Paris nomenclature when submitting manuscripts. An annotation on the new nomenclature, which takes account of the banding patterns on chromosomes for the first time, will appear in the June issue of the Journal of Medical Genetics.