

Genetic Analysis in Our Cases with Thyroid Dysgenesis

Elif Özsu¹, Filiz Mine Çizmecioglu²,
Gül Yeşiltepe Mutlu³, Ayşegül Yüksel²,
Narumi Sotoshi⁴, Şükrü Hatun²

¹Samsun Obstetrics and Children Hospital, Clinic of Pediatric Endocrinology, Samsun, Turkey

²Kocaeli University Faculty of Medicine, Department of Pediatric Endocrinology, Kocaeli, Turkey

³Zeynep Kamil Gynecology and Children Training Hospital, Clinic of Pediatric Endocrinology, Istanbul, Turkey

⁴Keio University Faculty of Medicine, Tokyo, Japan

Aim: To investigate the gene mutations causing defects in thyroid organogenesis and morphogenesis in cases with thyroid dysgenesis (TD).

Methods: The presence of variations/mutations in the genes *TSHR*, *PAX8*, *NKX2*, *FOXE1*, *TPO*, *TG*, *SLC26A4*, *SLC5A5*, *DUOX2*, *DUOX2A*, *IYD*, *TSHB*, *TRHR* and *IGSF1* was investigated in 35 cases diagnosed with TD on the basis of thyroid function tests, ultrasound, and scintigraphy at the Kocaeli University Faculty of Medicine between 2003 and 2013.

Results: Agenesis was present in 11 of the 35 patients who underwent mutation analysis, ectopia in 22, and hemiagenesis in 2. Heterozygous mutation in *SCL264A* was determined in 3 patients and heterozygous mutations in *DUOX2*, *DUOX* and *TSHR* in one patient each. Biallelic *DUOX2* mutation was detected in one patient and monoallelic probable pathological variants were detected in 6 patients. Mutation was determined in 2% of the subjects. However, there have been no previous reports of all mutations determined being heterozygous and these are probably polymorphisms.

Conclusion: TD is generally sporadic and mutations in the genes responsible for thyroid development have been shown in only a very small group of the cases.

Key words: Genetic, thyroid development, thyroid dysgenesis, mutations, polymorphism

A Case of Mosaic 45,X/46,XY Infertile Man with an AZF Deletion

Mine Balasar¹, Pelin Taşdemir¹, Özgür Balasar³,
Emine Göktaş¹

¹Necmettin Erbakan University Meram Faculty of Medicine, Department of Medical Genetics, Konya, Turkey

²Dr. Faruk Sukan Women and Children Hospital, Clinic of Medical Genetics, Konya, Turkey

Objectives: The frequency of chromosomal abnormalities is approximately 15% in azoospermic men. 45,X/46,XY mosaicism or mixed gonadal dysgenesis is associated with phenotypes ranging from normal male development to clinical signs of Turner syndrome. Y chromosome with structural chromosomal abnormalities is unstable and can be lost during mitosis. Therefore, structural chromosomal abnormalities of Y chromosome can be observed in individuals with 45,X/46,XY mosaic karyotype. We report here a mosaic 45,X/46,XY infertile man with azoospermia factor (AZF) deletion and normal male phenotype.

Methods: Karyotype analysis of peripheral blood was performed for the azoospermic and infertile male. We detected 45,X/46,XY mosaicism. So we performed FISH using centromere probes for the X and Y chromosomes. Y chromosome microdeletions were investigated by polymerase chain reaction assays. Also we investigated the AZF and sex-determining region Y (SRY) microdeletions for patient's father.

Results: Our patient was a 31-year-old male who has been married for 7 months; the couple were distant relatives. The patient was referred to Medical Genetics department from Urology with azoospermia and infertility diagnosis. The physical examination was normal except sparse eyebrows. Karyotype analysis was 45,X[20]/46,XY[39]. After applying XY centromeric FISH analysis, we detected 63% XY and 37% X interphase cells. Molecular analysis revealed that AZFa and SRY regions were present, but AZFb, AZFc, and AZFd regions were deleted. The father's results were normal.

Conclusion: 45,X/46,XY mosaic karyotype and AZF deletion were not hereditary. Genetic counseling was given to the family. We concluded that wide AZF region deletions caused 45,X/46,XY mosaic karyotype status in our patient to reveal unstable Y chromosome during mitosis. Our aim is to emphasize that Y chromosome microdeletions should be analyzed in 45,X/46,XY mosaic karyotype detected in infertile men with normal phenotype.

Key words: Mixed gonadal dysgenesis, karyotype AZF, deletion, FISH, fragment analysis