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My46 Trait Profile

Androgen Insensitivity syndrome

Androgen Insensitivity Syndrome is a rare genetic condition that affects sexual development in genetically male individuals. It is caused by mutations in the AR gene which makes the androgen receptor protein.

Characteristics of Androgen Insensitivity syndrome

Androgen Insensitivity Syndrome (AIS) is a genetic condition that affects sexual development. It is also known as a disorder of sex development. This condition affects individuals who are genetically male (i.e., those with one X chromosome and one Y chromosome), and results from the body not being able to respond to certain male hormones known as androgens. As a result, people with AIS can have a range of features including normal female external genitalia or the external genitalia are ambiguous.

AIS can be divided into complete androgen insensitivity syndrome (CAIS), and partial androgen insensitivity syndrome (PAIS. Those with CAIS have external female genitalia, but do not have a uterus or fallopian tubes. They are born with testes (male sex organs) that have not descended and remain in the abdomen. The testes are usually removed as they pose a risk for cancer. People with CAIS develop breasts and have a growth spurt during puberty, but never start their periods, have sparse pubic and underarm hair, and may be taller than other women. Those with PAIS are born with genitals that more closely resemble a male, more closely resemble a female, or do not look clearly male or female (ambiguous). People with PAIS may be raised as male or female depending on how responsive their body is to androgens.

Diagnosis/Testing

PAIS is usually diagnosed at birth if a baby is born with external genitalia that do not look completely male or completely female (i.e. ambiguous). CAIS is often diagnosed later in life, either in childhood when a growth in the abdomen is discovered to be a testicle, or more commonly in adolescence when a woman does not get her period as expected.

People with AIS have a change or mutation in the AR gene. This gene makes the androgen receptor that is responsible for responding to the actions of male sex hormones such as testosterone, which are needed for the development of male sex characteristics. If this receptor is not functioning properly, these male characteristics will not develop as expected.

Management/Surveillance

Because AIS presents with such a range of features, management requires individual assessment of the functional, sexual, and psychological issues by a multi-disciplinary team including endocrinology, medical genetics, and psychology. For those born with ambiguous genitalia, there may be a question of gender assignment. This requires the input from a multi-disciplinary team as well as the family. For those with CAIS or PAIS with predominantly female characteristics, it is generally recommended to remove the undescended testicles since they pose a risk for cancer. For those with predominantly male characteristics who are raised as male, hormone therapy at puberty may be required for the development of male sex characteristics. Breast development can occur in these individuals, and removal of the breast tissue may be considered. Genital surgery in certain cases of PAIS may also be considered.

Mode of inheritance

AIS is inherited in an X-linked recessive pattern. This means the AR gene is located on the X chromosome. Genetic females have two X chromosomes, and genetic males have one X chromosome and one Y chromosome. Males with a change or mutation in the AR gene will be affected with AIS, while females with a mutation in the AR gene on only one copy of their two X chromosomes are considered carriers of AIS. The mutation can be inherited from a carrier mother or it can occur brand new (de novo) in an affected child.

Risk to family members

The risk for a carrier mother to pass on her AR gene mutation to her children is 50% with every pregnancy. If that child is genetically male, he will be affected with AIS; if that child is genetically female, she will be a carrier of AIS.

Special considerations

None

Resources

Genetics Home Reference: Androgen Insensitivity Syndrome
http://ghr.nlm.nih.gov/condition/androgen-insensitivity-syndrome
Intersex Society of North America
http://www.isna.org/faq/conditions/ais

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Created: 09/2013 **Created by:** Susan Hiraki, MS, CGC

Updated: mm/yyyy **Edited by:** Seema Jamal, MSc, LCGC