General information about positive NIPT results: Autosomal monosomies

My patient's NIPT is positive for an autosomal monosomy. What does this mean?

Your patient's noninvasive prenatal testing (NIPT) result suggests the absence of a copy of a chromosome. NIPT is a screening test; false positives can occur. The actual chance for the pregnancy to have an autosomal monosomy depends on many factors, including the patient's clinical and family history.

Next steps to consider: You should discuss the results and the potential clinical implications with your patient. Globally, professional medical societies recommend that all women with a positive screening result should have genetic counseling and a comprehensive ultrasound evaluation with an opportunity for diagnostic testing to confirm the results.[1,2] Confirmation prior to birth can also help with pregnancy and neonatal management.

See below for information about autosomal monosomies.

What is autosomal monosomy?

Autosomal monosomy is a condition that is caused by the absence of one of the pairs of an autosomal chromosome (numbered 1-22), ie, one copy of a particular chromosome instead of two.

What are the features of an autosomal monosomy?

Autosomal monosomies are not common in liveborns. Most pregnancies with a monosomy of any autosome will miscarry spontaneously. Pregnancies with monosomies of larger chromosomes (1-13), or gene-dense chromosomes (17, 19) usually do not survive. However, certain monosomies, especially in a mosaic state, may survive. There are a few reported cases of certain autosomal monosomies (14, 15, 16, 18, 20, 21, 22) surviving. These cases had physical and developmental sequelae.[3] Prenatal ultrasound may indicate a fetal demise and other structural anomalies suggestive of an autosomal monosomy; however, a normal ultrasound will not exclude the condition.

What is the prevalence of this condition?

Unknown, but very rare. For this reason, positive predictive value (PPV) cannot be calculated.

What testing could be considered?

Specialized genetic tests such as karyotyping, fluorescence *in situ* hybridization (FISH), quantitative polymerase chain reaction (qPCR), and microarray are available to confirm the presence of an autosomal monosomy.

These confirmatory tests are generally performed on cells from chorionic villus sampling (CVS) or amniocentesis during pregnancy, on cord blood or peripheral blood sample after the baby is born, or on products of conception (POC) in the case of a miscarriage. The type of invasive procedure and diagnostic testing should take into account the underlying chromosome anomaly.[4,5]

Ultrasound evaluation may be useful in aiding with a prenatal diagnosis of an autosomal monosomy, but a normal ultrasound cannot exclude this condition.

References

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Additional resources

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