General information about positive NIPT results: Trisomy 16

My patient's NIPT is positive for trisomy 16. What does this mean?

Your patient's noninvasive prenatal testing (NIPT) result suggests the presence of an extra copy of chromosome 16. NIPT is a screening test; false positives can occur. The actual chance for the pregnancy to have trisomy 16 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 more information about trisomy 16.

What is trisomy 16?

Trisomy 16 is a condition that is caused by an extra chromosome number 16 (three copies instead of two).

What are the features of trisomy 16?

Pregnancies with full trisomy 16 will end in spontaneous miscarriage. If a developing fetus has mosaic trisomy 16 (where some cells are normal and some cells have trisomy 16), the pregnancy may survive to term. However, liveborn infants with mosaic trisomy 16 may have intrauterine growth restriction (IUGR), orofacial clefting, cardiac defects, renal abnormalities, and other medical conditions. Mosaicism for trisomy 16 can occur with variable phenotype. There is increased prevalence of adverse pregnancy outcomes such as preeclampsia, IUGR, spontaneous preterm birth, and stillbirth in pregnancies with trisomy 16. Confined placental mosaicism (CPM; when trisomic cells are present in the placenta, but not in the fetus) has not been frequently reported for trisomy 16.

What is the prevalence of this condition?

Trisomy 16 occurs in approximately 1 in 100 pregnancies. It is the most commonly observed trisomy in miscarriages, occurring in 7.5% of all miscarriages. This condition is rare in liveborn infants and the exact prevalence is not known. For this reason, positive predictive value (PPV) cannot be accurately 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 trisomy 16.

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.[3,4]

Ultrasound evaluation may be useful in aiding with a prenatal diagnosis of trisomy 16, but a normal ultrasound cannot exclude this condition.

Special considerations

Uniparental disomy (UPD) has also been described for chromosome 16. However, the role of UPD in the resultant phenotype remains unclear.

Resources for trisomy 16

MedlinePlus Genetics
medlineplus.gov/genetics/chromosome/16

Unique, The Rare Chromosome Disorder Support Group
rarechromo.org

References

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Additional resources

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