General information about positive NIPT results: Multiple aneuploidies

My patient's NIPT is positive for multiple aneuploidies. What does this mean?

Your patient's noninvasive prenatal testing (NIPT) result suggests the presence of aneuploidy of more than one chromosome. The presence of multiple aneuploidies in a pregnancy is very rare, but can happen. NIPT is a screening test; false positives can occur. The actual chance for the pregnancy to have multiple aneuploidies 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 multiple aneuploidies.

What is multiple aneuploidy?

Multiple aneuploidy refers to the presence of an extra or missing copy of multiple chromosomes.

What are the features of multiple aneuploidy?

Multiple aneuploidy results are rare. Several biological explanations may underlie such a result. Some of these reasons include, but are not limited to, complete or partial concordance with fetal results, maternal benign or malignant tumor, maternal aneuploidy, or technical reasons.[3] Most pregnancies with multiple aneuploidies will result in spontaneous miscarriage.[4,5] However, an estimated 0.16% of trisomy 21 cases involve a double aneuploidy with a sex chromosome (XXX, XXY, XYY, or monsomy X).[6] The clinical features are dependent upon the exact chromosomes involved. Prenatal ultrasound can be normal. A normal ultrasound cannot 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 multiple aneuploidies.

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.[7,8]

Ultrasound evaluation may be useful in aiding with a prenatal diagnosis of multiple aneuploidy, but a normal ultrasound cannot exclude these conditions.

Special considerations

NIPT results of multiple aneuploidies have been linked to occult maternal benign or malignant tumors.[9-14]

NIPT should not be offered to patients with known malignancy, since the NIPT results may not accurately reflect fetal chromosomal status.[15]

References

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Pub. No. 1576-2020-066 QB9694