GOVERNMENT OF WESTERN AUSTRALIA

PathWest LABORATORY MEDICINE WA

CLINICIAN GUIDE

Pregnancy Loss Genetic Testing | Chromosomal Microarray

From 1 October 2020, all requests received by PathWest for chromosomal/cytogenetic analysis of fresh products of conception or fetal tissue will be analysed by chromosomal microarray. This will replace conventional karyotype for evaluation of pregnancy loss and comes with additional testing benefits, but also some important changes for clinicians and additional counselling information for patients.

Changes for clinicians - counselling patients

Prior to sending a test request, it is important that couples/individuals are counselled by the requesting clinician regarding the benefits, limitations and complexities of microarray.

To help guide this conversation and inform patient consent, patient guide 'Fetal Chromosomal Microarray Information & Consent' is available.

Requesting clinicians can utilise the updated PathWest request form 'Pregnancy Loss Genomic Test Request Form'.

These resources are both available at the PathWest website (see below).

About Chromosomal Microarray

Over half of early pregnancy losses are caused by a chromosomal abnormality and a genetic cause for a loss may be identified at any gestational age [1].

Microarray detects most clinically significant cytogenomic abnormalities, including gross chromosomal aneuplodies and triploidy, as well as submicroscopic (microdeletion/microduplication) copy number changes.

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Advantages of microarray

The key advantages of microarray over conventional karyotype for evaluation of pregnancy loss include:

- Cell culture is not required; therefore, the test failure rate is significantly reduced [2,3].
- A higher diagnostic yield is achieved as small clinically significant abnormalities can be detected that would not be visible by karyotype [2,3].
- The additional information provided may enable more accurate calculation of recurrence risks for future pregnancies and inform future reproductive decisions.
- In the presence of maternal cell contamination, microarray can reduce the possibility of an inaccurate result.

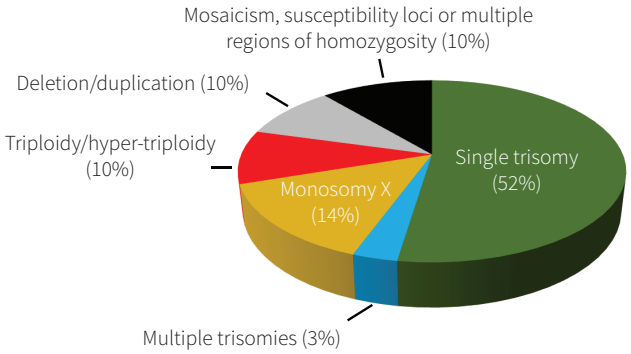

Figure 1

Abnormalities identified by microarray analysis of products of conception at PathWest
This figure represents PathWest data for requests received between 1 April 2019 and 30 June 2020. A main benefit of chromosomal microarray is the identification of submicroscopic deletions or duplications, which would not have been detected by conventional chromosome analysis.

Understanding the limitations and complexities of microarray testing

Please note the following limitations and complexities of microarray testing which may guide discussions and genetic counselling with your patients.

- Microarray cannot provide structural information. For this reason, follow-up parental karyotype analysis may be recommended in the test report for assessment of recurrence risk in future pregnancies.
- Genetic variants of uncertain clinical significance (VOUS) are sometimes identified; however, our reporting threshold policy greatly limits the possibility of a VOUS being reported. Parental testing may be useful in determining the significance of these variants.
- Microarray may reveal secondary findings with implications for the extended family. These may include variants associated with disease in later life or with susceptibility to neurodevelopmental disorders, and parental relatedness. Genetic counselling will be helpful to resolve issues with such findings.
- Although microarray offers a higher sensitivity than conventional cytogenetics, it cannot identify all genetic causes of pregnancy loss (e.g. sequence variants and epimutations).

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Test requirements and turnaround times

Sample requirements – collection and transportation

Fresh fetal tissue or products of conception will need to be transported in a sterile container with PBS or normal saline.

Request form

A generic pathology request form can be used; however, the specialised 'Pregnancy Loss Genomic Test Request Form' is recommended (see Supporting Resources below).

Consent

It is important that couples/individuals receive appropriate counselling regarding the benefits and limitations of microarray prior to the test request.

A patient guide and consent form is available to assist with the counselling process.

Please note that PathWest does not require a copy of this consent form.

Turnaround times

Results are typically available within six weeks.

Billing

The genetic analysis of pregnancy loss samples by microarray is covered by Medicare (Item 73287).

References

[1] Sahoo et al, 2017, PMID 27337029.
[2] Pauta et al, 2018, PMID 29055063.
[3] Martinez-Portilla et al, 2019, PMID 30549343.

More information

For more information or questions please get in touch with the PathWest Diagnostic Genomics team by calling (08) 6383 4234 or emailing DiagnosticGenomicsQE.PathWest@health.wa.gov.au.

For supporting resources, please email the PathWest Client Liaison team info@pathwest.com.au or visit the Diagnostic Genomics pages at www.pathwest.health.wa.gov.au

Supporting resources

Request Form
Pregnancy Loss Genomic Test Request Form

Patient Guide and Consent
Patient Guide and Consent | Fetal Chromosomal Microarray Information

Clinician Guide
Clinician Guide | Pregnancy Loss Genetic Testing - Chromosomal Microarray

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Available in alternative formats upon request