Pharmacogenomic Testing

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Summary: Pharmacogenomic (PGx) testing is a way of analyzing a person's genetics, in order to understand why some people don't respond to certain medications or have significant side effects with certain medications. In certain situations, this can be helpful in deciding what medications might be helpful.

Introduction

Medications can be helpful for many conditions. However, many people find that despite trying multiple medications, they still struggle.
Pharmacogenomic (PGx) testing is a way of analyzing a person's genetics, in order to understand why some people don't respond to certain medications or have significant side effects with certain medications. The testing can help guide decisions around what medications might be helpful for certain conditions.

When Might Pharmacogenomic Testing be Helpful?

Pharmacogenomic testing is not helpful for most situations.
However, it might possibly be helpful for the following specific situations:

- You have tried the usual medication(s) for a condition (such as depression) but have not responded to the medication;
- You are taking multiple medications for multiple conditions;
- You have significant side effects from taking medications, which prevents you from being able to take medication(s).

What Does Pharmacogenomic Testing Involve?

Pharmacogenomic testing involves providing a saliva sample and having it tested by a laboratory. At the lab, it is possible to extract the DNA (genetic material) from cheek cells, and thus analyze the person's DNA.
After the DNA is analyzed, one receives a report that comments on:

- Pharmacokinetic markers: These markers give information about how a medication is metabolized ("broken down") by the P450 cytochrome system by a person's body. It can explain how if a person is a "rapid

metabolizer" that they might not respond to a medication because it is broken down too quickly. It can also explain how a person might be a "slow metabolizer" which means medication builds up quickly in the body leading to side effects.

- Pharmacodynamic markers: These markers are supposed to give information on how the drug affects the person. At this point, there is much less evidence about these markers, e.g. many are based on single studies with limited sample sizes.

What Does the Evidence Say?

The field of pharmacogenomic testing is still at the starting point.
A review in 2017 by Health Quality Ontario looking at pharmacogenomic testing for depression found that it did not actually make a significant difference in patient outcomes.
https://www.hqontario.ca/Portals/0/documents/evidence/reports/hta-genesight-13-03-2017-en.pdf
The FDA has issued a statement of caution as well.
https://www.fda.gov/medical-devices/safety-communications/fda-warns-against-use-many-genetic-tests-unapproved-claims-predict-patient-response-specific#actions
For this reason, pharmacogenomic testing is not recommended for everyone, but more for certain situations, e.g. poor response despite several medication trials.
Note that even if one has had a poor response to several medication trials, one should also fully explore other explanations such as:

- Are there other diagnoses or conditions that might be contributing to the situation? For example, could there be a diagnosis such as:
    - Autism spectrum disorder
    - Sensory processing problems
    - Developmental coordination disorder
    - Learning disabilities
    - Intellectual disabilities
    - Trauma
    - Substance use issues
    - And so on….
- Are there other **non-medication treatments** that should be tried, such as talk therapies (cognitive-behaviour therapy), or non-talk therapies (seeing an occupational therapist), etc.?

Where To Find Pharmacogenomic Testing

Speak with your health care provider or pharmacist to see if it might be helpful in your situation, and where to find it in your area. Note that in many (perhaps even most) situations, it will probably not add much information.

About this Article

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Conflicts of interest: The authors have no competing interests to declare.