Study: Genetic tests often overused and misinterpreted

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One of every three genetic tests examined by a team of researchers at the San Diego Naval Medical Center shouldn't have been prescribed, a finding that adds to growing body of evidence suggesting that genetic tests are routinely overused and often misinterpreted.

The new analysis earned a first-place award from the American Congress of Gynecologists and Obstetricians, or ACOG, which is nearing the end of its annual national meeting in San Diego.

Though the study's scope was limited - it reviewed 114 cases and looked at only seven genetic tests among the hundreds that doctors regularly order - its results nonetheless reinforce previous research that arrived at similar conclusions.

In 2014, for example, Stanford University reported that three San Francisco Bay Area women chose abortions after undergoing DNA screening tests that erroneously showed that their unborn babies had a serious genetic condition such as Down syndrome or nearly-always-fatal genetic condition Trisomy 13.

Recently, many researchers have criticized physicians who counsel bilateral mastectomies for women who get an "ambiguous" finding of "uncertain significance" when they undergo genetic testing for mutations of the BRCA1 and BRCA2 cancer genes.

"This underlines that informed decision-making is very important," said

Dr. Kathleen Ruzzo at the naval medical center, who is the main recipient of the OB/GYN organization's award.

Her team found that 44 of the cases it evaluated - 38 percent - used genetic tests in ways that were not fully compliant with best practice guidelines issued by organizations such as ACOG. Twenty-four were ordered to help diagnose symptoms that they were not designed to explain, 12 provided inadequate information to diagnose specific symptoms and eight provided false reassurance about genetic risk.

Dr. Monica Lutgendorf, another obstetrician and gynecologist on the San Diego research team, noted that one commonly ordered genetic screener, called a free cell DNA test, is significantly pricier than the blood serum test it replaces.

"It costs between $600 and $1,000 compared to the serum screen, which costs about $100," Lugendorf said.

The research team did a financial analysis of the 44 wrongly ordered tests it discovered and found that choosing the correct alternatives would have saved nearly $21,000.

What's more, looking just at the free cell DNA test, both physicians noted that choosing the serum test for women younger than 35 would not just save money, but also increase the odds of detecting other potentially harmful conditions and would reduce the chance of the of false positives for scary conditions such as Down syndrome. It is these kinds of misdiagnoses that have led some women to choose abortions as chronicled in a 2014 expose by the New England Center for Investigative Reporting.

San Diego researchers said their findings argue for better education of doctors who are ordering these tests and for greater involvement of

genetic counselors who specialize in understanding the often-subtle nuances of what these powerful diagnostic tools can do and what they can't.

ACOG, which attracted about 5,000 obstetricians and gynecologists to San Diego for its national meeting, is featuring new training modules designed to help doctors improve their knowledge about genetic tests they might want to order for their patients.

Mary Freivogel, president of the National Society of Genetic Counselors, applauded that perspective. She said the San Diego naval team's results roughly track with another study, published in the *American Journal of Medical Genetics* in 2014, which found that 26 percent of genetic tests were wrongly ordered when researchers analyzed 21 months of genetic test orders that passed through a university lab in Salt Lake City.

Freivogel said that there are plenty of doctors who understand every aspect of the genetic tests they order, but many don't. Medical schools, she said, may not spend much time on the ins and outs of genetic testing, and many may have gone to school before the current array of tests were invented.

Doctors are often faced with sales pitches on these tests, which can gloss over key issues, she said. Take the free cell DNA tests, for example. They can predict the risk of Down syndrome with 99 percent certainty. However, at the end of the day, risk of disease is not the same thing as actually having that disease. Screening for risk is not the same thing as making a definitive medical diagnosis.

"This is a screening test, and it should always be confirmed by an invasive test such as through amniocentesis to make sure," Freivogel said.

In the Bay Area cases, an expert at Stanford University reported examining the tissue of three babies aborted after a genetic test had indicated heightened risk of Down syndrome. In reality, further screening would have revealed that none of those children had the condition.

Likewise, some patients and their physicians have overreacted to test results for the BRCA1 and BRCA2 cancer genes.

While positive and negative results are quite reliable, some women get a middle-of-the-road finding often called a "genetic variant of uncertain significance." This means that the genetic test did find some mutations in the BRCA genes, but those mutations have not been proven to cause aggressive and difficult-to-treat breast cancer as other mutations in the same genes have.

In recent years, some women have undergone double mastectomies when they get these less-than-guaranteed findings.

At the end of the day, Freivogel said patients would do well to be thorough and methodical about genetic testing.

"The truth is, it is a unique thing to be able to do this well and to be able to take the time to do it well. If you are going to make an important decision based on genetic test results and you haven't seen a genetic counselor, I would encourage you to do so first," Freivogel said.

The society maintains a list of counselors at www.findageneticcounselor.com that is searchable by ZIP code.