Kan Testleriyle Akciğer Kanseri Erken Teşhis Edilebilir

- ✓ **Akciğer kanseri, ölüme neden olan en sık kanserdir**

- ✓ **Akciğer kanserinin ana nedeni; yaklaşık olarak%90 oranında sigara ve benzeri ürünler neden olur. Daha az oranda, havada ki radyoaktif partiküller, genetik yatkınlık neden olur**

- ✓ **Akciğer kanserinin büyük bir oranı, tütün ürünlerinin azaltılması ile beraber önlenebilir. Bunun örneklerini, batı toplumunda ki istatistiksel oranlarda görüyoruz.**

- ✓ **Eğer bir kanser türünün oluşumunu engelleyemiyorsak, en ideali erken tanı koyarak, ölümcül aşamaya gelmeden önlemektedir.**

- ✓ **Kanada - Amerika ortak yapılan bir çalışma, bu konuda bilim dünyasını heyecanlandır.**

- ✓ **Çalışmaya geçmeden önce bazı temel bilgilerden bahsetmek gerekecek.**

- ✓ **Akciğer kanseri erken teşhiste Standard olan yüksek risk grubuna yıllık tomografi çekmektir. Detaylar aşağıda belirtilmiştir**

- ✓ **Low-dose helical computed tomography (CT)**

- ✓ **55-74 Yaşları arasında, 30 yıl/paket sigara içen bireylere önerilir**

- ✓ **Yılda bir yapılması önerili**

- ✓ **The National Lung Screening Trial (NLST) çalışması NEJM 2011 tarihinde yayınlaması ile kavuzlara girmiştir.**

- ✓ **Bu çalışmaya göre düşük doz helikal tomografi ile semptom, bulgu ve akciğer kanseri tanısı olmayan bireylerde tarama ile akciğer kanserine bağlı ölüm %15-20 oranında daha az görülmektedir.**

- ✓ **Düşük doz helikal tomografi ile 1000 taramada %24.2, PA akciğer ile taramada %6.9 oranında akciğer kanseri erken tanısı konmuş.**

- ✓ **Akciğer adeno ve skuamöz kanser erken evrede saptanmış, fakat küçük hücreli akciğer kanseri erken evre tespit edilme oranı çok düşük oranda saptanmış.**

- ✓ **Düşük doz helikal tomografi ile 1000 kişiye uygulanan tarama ile 3 kansere bağlı ölüm engellenmiştir.**

- ✓ **Yıllık tomografi yüksek risk grubuna önerilmek ile birlikte maalesef Ülkemiz dahil çoğu ülkede, maliyet ve uygulama, yorumlama zorluğu nedeniyle yaygın kullanılmamaktadır.**

- ✓ **Dana-Farber Cancer Institute ve Harvard Medical School ortkak çalışması, Akciğer kanserini kan testi ile önemli oranda erken evrede tanı konulabilineceğini göstermiştir.**

- ✓ **Kan testi ile somatik tek nükleotid mutasyonları, insertion, deletion, somatik gen değişimleri, epigentik değişiklikler(methylation) ile kanser teşhisi kanda konuluyor**

- ✓ **1700 denekte yapılmış, bunların %70 akciğer kanseri tansı var ve %30 kontrol olarak çalışmaya dahil edilmiş.**

- ✓ **Bu çalışmanın en önemli özeliği yalancı pozitiflik oranı%1 az. Yani kanser olmayana kanser teşhisi konma oranı çok düşük.**

- ✓ **Diğer önemli özeliği hedefe yönelik genetik analizle erken evre teşhisi(evre I-IIIA) oranı %51 ve geç evre(IIIB-IV) kanser tanısı konma oranı %89**

- ✓ **Çalışmayı yapan bilim adamaları, kan testi ile erken teşhiste umutlu olduklarını, testin daha büyük popülasyonda uygulanarak standart hale getirilmesi gerektiğini belirtiyor.**

Sonuç: Akciğer kanseri, Tomografi ile yüksek risk grubunda olanlarda %24 oranında erken teşhis koyar. Tomografi çekimine göre daha kolay uygulanan kan testleri ile yaklaşık %50 oranında erken teşhis konulabilinir. Kan testlerin Standard hale gelmesini beklemek gerekecek.

KAYNAK

2018 ASCO: Blood Test Shows Potential as a Detection Tool for Early-Stage Lung Cancer

Key Points

- At 98% specificity, the WGBS assay detected 41% of early-stage (I–IIIA) lung cancers and 89% of late-stage (IIIB–IV) cancers.
- The WGS assay was similarly effective, detecting 38% of early-stage cancers and 87% of late-stage cancers, whereas the targeted assay detected 51% of early-stage cancers and 89% of late-stage cancers.
- Initial results showed that all three prototype assays could detect lung cancer with a low rate of false-positive findings.

An initial report from the large, ongoing Circulating Cell-Free Genome Atlas (CCGA) study provides preliminary evidence that a blood test may be able to detect early-stage lung cancer. This is one of the first studies to explore blood tests analyzing free-floating or cell-free DNA as a tool for the early detection of cancer. The findings were featured in a press briefing today and will be presented by Oxnard et al at the 2018 ASCO Annual Meeting (Abstract LBA8501).

“We’re excited that initial results from the CCGA study show it is possible to detect early-stage lung cancer from blood samples using genome sequencing,” said lead study author **Geoffrey R. Oxnard, MD**, Associate Professor of Medicine at Dana-Farber Cancer Institute and Harvard Medical School.

“There is an unmet need globally for early-detection tests for lung cancer that can be easily implemented by health-care systems.”

Survival rates are significantly higher when lung cancer is diagnosed early. In the United States, annual lung cancer screening with low-dose computed tomography (CT) is recommended by the U.S. Preventive Services Task Force for people with significant smoking history, but screening is vastly underutilized. Globally, low-dose CT is not widely adopted due to cost and lack of health infrastructure.

Having a blood test that can be done through a simple blood draw at the doctor’s office may improve lung cancer screening rates, but before such a test could be widely used, additional validation in larger data sets and in studies with people who have not been diagnosed with cancer would be needed.

Analysis of cell-free DNA from blood is already used to help choose targeted therapies (eg, the cobas *EGFR*mutation test), but such “liquid biopsies” are used only for people with advanced lung cancer. Until recently there has been limited evidence to show cell-free DNA analysis may be feasible for early detection of lung cancer.

About the CCGA Study

The CCGA study has enrolled more than 12,000 of the planned 15,000 participants (70% with cancer, 30% without cancer), across 141 sites in the United States and Canada. This report is from the first preplanned substudy from the CCGA, in which three prototype sequencing assays were performed on blood samples from approximately 1,700 participants. Twenty different cancer types across all stages were included in the substudy.

In this initial subanalysis, researchers explored the ability of three different assays to detect cancer in 127 patients with stage I to IV lung cancer. The three assays that were designed to detect cancer-defining signals (mutations and other genomic changes) that could be used in the development of an early cancer detection test are:

- Targeted sequencing, to detect somatic mutations, such as single-nucleotide variants and small insertions and/or deletions
- Whole-genome sequencing (WGS), to detect somatic gene copy number changes
- Whole-genome bisulfite sequencing (WGBS) of cell-free DNA, to detect abnormal cell-free DNA methylation patterns (epigenetic changes).

Key Findings

Among the 127 participants with lung cancer, the biologic signal for lung cancer was comparable across the assays, and the signal increased with cancer stage. At 98% specificity, the WGBS assay detected 41% of early-stage (stage I–IIIA) lung cancers and 89% of late-stage (stage IIIB–IV) cancers. The WGS assay was similarly effective, detecting 38% of early-stage cancers and 87% of late-stage

cancers, whereas the targeted assay detected 51% of early-stage cancers and 89% of late-stage cancers.

Initial results showed that all three prototype assays could detect lung cancer with a low rate of false-positive findings. Of the 580 control samples (from people without cancer at study enrollment) in the substudy, 5 (< 1%) had a cancer-like signal across all three assays. Of those 5 participants, 2 were subsequently diagnosed with cancer (1 with stage III ovarian cancer and 1 with stage II endometrial cancer), highlighting the potential for such a test to identify early-stage cancers.

The study also found that in the participants with lung cancer, more than 54% of somatic mutations detected in the blood samples were derived from white blood cells and not from tumors. These mutations are likely due to natural aging processes (so-called clonal hematopoiesis of indeterminate potential) and will be important to consider when developing blood tests for early detection of cancer, noted Dr. Oxnard.

Next Steps

The researchers are verifying these results in an independent group of approximately 1,000 participants from CCGA as part of the same substudy.

“These are promising early results, and next steps are to further optimize the assays and validate results in a larger group of people,” said Dr. Oxnard. With increased sample sizes, machine-learning approaches are expected to improve assay performance, he noted.

Commentary

“We’re one step closer to being able to detect early lung cancer from a simple blood test. While there’s still a way to go before cell-free DNA from blood can be used for cancer detection on a broad scale, this research serves as a building block for the development of future tests,” said ASCO Expert **David Graham, MD, FASCO.**

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