Docket #: S22-302

Blood-based inflammatory biomarkers for the prediction of post-operative cognitive decline after surgery

Stanford scientists develop a method for assessing patient risk of developing postsurgical neurocognitive complications using a combination of biomarkers. This method will ensure improved interventions and treatment outcomes.

Postoperative cognitive decline (POCD), defined as cognitive impairment arising after surgery, is a common clinical problem that occurs in 10-54% of patients within the first few weeks following surgery and can persist for several months and years. POCD affects patients of all ages but is more common in older people. A recent study reported that 28.5% of people over 60 develop POCD upon discharge. Predicting the risk of developing POCD would improve interventions and patient care.

Therefore, Stanford researchers developed a method that assesses patient risk for POCD after surgery that involves:
1. Quantifying protein activity of multiple immune cell subsets in peripheral blood using fluorescence flow or mass cytometry.
2. Quantifying plasma proteins using an antibody-based or aptamer-based technology.
3. Integrating immune cell and proteomic features with patients demographic, medical history, and cognitive data using a multivariate machine learning method.
4. Calculating a surgical complication risk score for the prediction of postoperative neurocognitive disorder.
With this novel approach, the current burden of POCD can be reduced.

Stage of Development
Proof of concept

Applications

- Pre-surgery, in vitro diagnostic testing for POCD susceptibility for any patient undergoing elective surgery.

Advantages

- It is the only test of its kind.

Patents

- Published Application: WO2024064892
- Published Application: 20260229316

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