CHEST

Circulating Endometrial Cells

A Diagnostic Test for Distinguishing Catamenial From Spontaneous Pneumothorax?

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Among the numerous physiologic functions of the lung, the ability of the pulmonary vasculature to filter remains critically important and frequently overlooked. Most clinicians consider pulmonary vascular filtering in the context of clinical derangements, such as pulmonary thromboembolic disease, venous air embolism, fat emboli syndrome, amniotic fluid embolism syndrome, and tumor emboli syndrome.[1]

However, the circulation contains spontaneously forming thromboemboli in healthy individuals, gas bubbles following phlebotomy or surgery, globules following long bone fracture, amniotic debris in the peripartum period, and tumor cells in malignancy. These substances and cells can circulate to and through the circulation without triggering adverse consequences of clinical syndromes.[1] No single diagnostic test exists to discern patients with benign circulating substances and cells from patients experiencing a potentially life-threatening clinical syndrome.[1]

FOR RELATED ARTICLE, SEE PAGE 342

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However, gene expression profiling of the endometrium can distinguish between women with and without endometriosis.[2] Endometrial cells circulate in women with endometriosis, regardless of whether they are destined to experience catamenial pneumothorax (CP).[3] In this issue of *CHEST*, Kiss et al[4] use gene expression profiling to extend these prior observations with an analysis of the genetic signatures associated with circulating endometrial cells (CECs) in women with CP. Their proof-of-concept study reveals one CEC genotype associated with transdiaphragmatic communications between the abdomen and thorax; and another CEC genotype associated with pleural implantations of endometrial tissues.[4] Both CEC genotypes exhibit significantly higher expression of HER2 compared with CECs from women with endometriosis who had not experienced a pneumothorax.[4] Their data also hint at a potential dose-response relationship, with larger numbers of CECs found in patients with recurrent CP.[4]

Kiss et al[4] propose assessing CEC gene expression profiles as a potential diagnostic test for women. Such a diagnostic test might cue a search for endometriosis in young women presenting with a de novo spontaneous pneumothorax, as well as identify women with known endometriosis at high risk for developing CP.[2,5,6] This diagnostic test could inform decision making on pleurodesis after an initial presentation with spontaneous pneumothorax.[5,6] Indeed, this general approach could have broader applications, with the number of CECs and their gene expression profile potentially distinguishing CP from other unique, rare causes of spontaneous pneumothorax in young women with cystic lung disease, such as Birt-Hogg-Dubé syndrome, Langerhans cell histiocytosis, and lymphangioleiomyomatosis, although most of these disorders are readily identifiable on clinical grounds.

The development of a useful test will hinge on future studies replicating the findings of Kiss et al, comparing gene expression profiles of patients with CP and spontaneous pneumothorax with those of appropriate clinical cohorts, and fulfilling standardized criteria for the development of a routine diagnostic test.[7,8]

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