ECRONICON OPEN ACCESS

EC GYNAECOLOGY
Editorial

Biomarkers for Ectopic Pregnancy. Why is it So Hard?

Ricardo F Savaris*

Full Professor of ObGyn Department, School of Medicine, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil

***Corresponding Author:** Ricardo F Savaris, Full Professor of ObGyn Department, School of Medicine, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil.

Received: March 05, 2021; **Published:** March 08, 2021

DOI: 10.31080/ecgy.2021.10.00581

The search for biomarkers to identify early cases of ectopic pregnancy (EP) has been sought by many [1-8]. Nevertheless, β-hCG is the only biomarker that has been widely clinically used for the diagnosis of EP [9]. A promising commercially available biomarker [10] was not confirmed in a larger cohort [11].

Many questions are raised about these discrepancies. The answer is not complex, but it is long. We have four phases to develop a biomarker for clinical use: 1) Preclinical exploration, 2) Clinical assay development, 3) Assessment of predictive ability in a retrospective study and 4) Validation in a prospective setting [12]. The fourth phase is the real test and many biomarkers do not pass the test. The reason for this failure is that basic aspects of epidemiology and Bayesian theorem are forgotten.

We need to know the incidence of a condition, signs and symptoms, risk factors, and the performance of ancillary exams. After these procedures, a probability is obtained. This probability may cross an arbitrary threshold of action and no further diagnostic test will be necessary. For instance, a physician decides that after crossing the 85% chance of having EP, no further diagnostic tests are needed and surgery is scheduled; if the probability of ectopic is less than 1%, EP is excluded. A negative biomarker with excellent performance is useless when embryo heartbeat is present outside the uterus. Consider the following parameters: the probability of having EP in an asymptomatic woman, without risk factor, is 2% (patient 1), while in a woman with pelvic pain and vaginal bleeding and a history of tubal ligation is 45% (patient 2). A hypothetical biomarker has a sensitivity and specificity of 84% and 93%, respectively. In the first patient, the probability of having an EP is 19.8%, while in the second, is 90.8% when the same biomarker is positive.

Therefore, the problem with biomarkers is how and when they are used. In medicine, we need to know the incidence of a disease in our setting, which risk factors really matter, the performance of each exam and what sequence they should be applied. The sequence of exams varies by different society guidelines [13]. In a case of pregnancy of unknown location, the use of biomarkers should be used in light of the signs, symptoms and risk factors of the patient.

Medicine is not made solely of biomarkers; they are ancillary tests to confirm or to exclude a diagnostic hypothesis. Thus, the physician should have a hypothesis first, apply the risks of having the disease, perform the physical exam and use the biomarker. They should not do the opposite, ask the biomarker and then check the patient. As we used to say in medical school, if lab exams are inconclusive, perform history and physical examination.

Bibliography

1. Sun Jianhua., *et al.* "Exosomal MicroRNAs in Serum as Potential Biomarkers for Ectopic Pregnancy". *BioMed Research International* 2020 (2020): 3521859.

2. Bobdiwala Shabnam. "The ABPEP Study: Assessment of Biomarkers in PUL (pregnancy of Unknown Location) and Ectopic Pregnancy". N.p., (2019).

3. Ghorbani Maryam., *et al.* "Creatine Phosphokinase, a New Marker in Diagnosis of Tubal Ectopic Pregnancy; A Systematic Review". *Archives of Academic Emergency Medicine* 8.1 (2020): e9.

4. Friis Petersen Jesper., *et al.* "Soluble Urokinase Plasminogen Activator Receptor (suPAR) as a Biomarker of Early Pregnancy Location and Viability Compared with hCG, Progesterone and Estradiol". *Journal of Reproductive Immunology* 138 (2020): 103103.

5. Daponte Alexandros., *et al.* "Activin A and Follistatin as Biomarkers for Ectopic Pregnancy and Missed Abortion". *Disease Markers* 35.5 (2013): 497-503.

6. Rausch Mary E., *et al.* "Development of a Multiple Marker Test for Ectopic Pregnancy". *Obstetrics and Gynecology* 117.3 (2011): 573-582.

7. Florio Pasquale., *et al.* "Single Serum Activin a Testing to Predict Ectopic Pregnancy". *The Journal of Clinical Endocrinology and Metabolism* 92.5 (2007): 1748-1753.

8. Refaat Bassem and Adil O Bahathiq. "The Performances of Serum Activins and Follistatin in the Diagnosis of Ectopic Pregnancy: A Prospective Case-Control Study". *Clinica Chimica Acta; International Journal of Clinical Chemistry* 500 (2020): 69-74.

9. Memtsa M., *et al.* "Diagnostic Biomarkers for Predicting Adverse Early Pregnancy Outcomes: Scientific Impact Paper No. 58". *BJOG: An International Journal of Obstetrics and Gynaecology* 126.3 (2019): e107-e113.

10. Mazouz Silhem., *et al.* "Evaluation of a Urinary Test as a Diagnostic Tool of a Nonprogressive Pregnancy". *Fertility and Sterility* 95.2 (2011): 783-786.

11. Teixeira João L G., *et al.* "Sensitivity and Specificity of a Urinary Screening Test Used in an Emergency Setting to Detect Abnormal First Trimester Pregnancies". *American Journal of Obstetrics and Gynecology 212*.1 (2015): 58.e1-5.

12. Senapati Suneeta and Kurt T Barnhart. "Biomarkers for Ectopic Pregnancy and Pregnancy of Unknown Location". *Fertility and Sterility* 99.4 (2013): 1107-1116.

13. Van Mello Norah M., *et al.* "Ectopic Pregnancy: How the Diagnostic and Therapeutic Management Has Changed". *Fertility and Sterility* 98.5 (2012): 1066-1073.

Volume 10 Issue 3 March 2021