CONGRESUL CONSACRAT ANIVERSĂRII A 75-A DE LA FONDAREA USMF „NICOLAE TESTEMIȚANU”

20 23 octombrie 2020

UTILITY OF ROMA ALGORITHM IN ASSESSING THE AGGRESSIVE POTENTIAL OF OVARIAN TUMORS DURING PREGNANCY

Igor Munteanu[1], Zinaida Sârbu[1]

[1]Department of Obstetrics and gynecology, Nicolae Testemitanu State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

Introduction

According to literature data the incidence of ovarian cysts during pregnancy ranges from 0.15 to 5.7% [1],[7],[13].

Of the total number of ovarian tumors detected during pregnancy, the incidence of those with malignant potential varies within the limits of 0.8 - 13% [4].

It is important to emphasize that malignant ovarian tumors are among the top five cancers detected during pregnancy [9], [6]. Their low incidence incriminates the pathology an incognito status for most of practitioners by creating difficulties in adopting a rational conduct of both pregnancy and birth for these patients.

The vast majority of ovarian tumors in pregnant women are detected in the first or second trimester of pregnancy, of which 65-80% are usually asymptomatic and regress spontaneously by 14 weeks of gestation[8].

In order to prevent complications related to ovarian tumors during pregnancy such as ovarian torsion, rupture of the ovarian cyst with acute abdomen, obstruction of the birth pathways, and last but not least, tumor malignancy, persistent ovarian tumors in the second trimester of pregnancy are usually resolved surgical [3], [10].

The incidence of ovarian cysts detected during pregnancy varies considerably in different researchers reports.

Most of them are functional cysts that usually reabsorb spontaneously up to 14 weeks of gestation and that generate an illusory shadow for practitioners, underestimating a considerable percentage of tumors with aggressive potential.

Using imaging tools, clinical data, tumor markers in combination with logistic tools for calculating aggressive tumor potential through the Adnexal Mass Risk Prediction Models platform, is essential for risk stratification, making a prognosis and facilitating the choice of rational management.

Purpose

Familiarizing practitioners with the adjuvant opportunities of developed diagnostic tools to optimize the preoperative differential diagnosis of ovarian tumors during pregnancy.

Keywords

Ovarian tumors, pregnancy, prognosis.

Material and methods

We conducted a cross-sectional, prospective study. The paper reflects the analysis of the results obtained in 26 pregnant women with ovarian cysts detected during pregnancy, who subsequently benefited from surgical treatment during the period 2016-2019.

The following specific laboratory data were analyzed in the study:

Tumor markers

Tumor markers are useful both in the diagnosis of neoplastic processes, for assessing the progress of treatment and clinical surveillance of patients who have received antitumor treatment [2].

CA-125 (cancer antigen 125)

CA-125 is a mucoglycoprotein synthesized mainly by tumor cells, but we will mention that this tumor marker is synthesized in considerable quantities and in the embryonic coelomic epithelium, so the importance of this oncomarker in the first trimester of pregnancy is limited, with considerable increase of its sensitivity and specificity in the second and third trimesters of pregnancy [1], [18].

The threshold value of CA-125 during pregnancy, according to numerous studies, is 35U / ml with limits of variations in the first trimester between 40 and 100 U / ml [16], [14]. Starting with the second trimester of pregnancy, there is a decrease reaching the values of a healthy nonpregnant woman 15 - 35 U / ml which are maintained until the end of the pregnancy [14], [15].

HE4 (Human Epididymis protein 4)

A tumor marker of specific importance that can be detected physiologically in insignificant amounts in trachea, pancreas, in the normal tissues of the ovary, fallopian tube, endocervix [17], [12].

Pregnancy has no impact on HE-4, being useful in doubtful cases of ovarian tumors in pregnant women [2].

Elevated levels of this tumor marker have been detected in most cases of serous and endometrioid ovarian adenocarcinoma, in cases of ovarian clear cell cancer and less frequently in the case of ovarian mucinous adenocarcinoma [11], [5].

ROMA index - includes two serological variables, namely the values of tumor markers CA-125 and HE4.

Morphopathological study with histological examination:

Basic diagnostic method is widely accepted and empowered with the right to state the final decision regarding the tumor substrate and the type of tissue.

It offers the possibility to choose a complementary method of targeted postoperative treatment, especially for oncological pathologies.

This relatively inexpensive method provides valuable data on the reversibility or not of the morphofunctional integrity of the organ, after removing the vulnerable factor.

The analysis and systematization of the data obtained from the morphopathological and histological examination can generate objective conclusions that would be the basis of the argument of radical surgery without remorse regarding the preservation of functionally depleted tissues by dystrophic mechanisms.

At the same time, it can bring solid arguments in favor of organo-preservation surgery when whole morphofunctional units are discovered in the remaining tissue after the removal of the vulnerable factor.

Fig. The structure of ovarian tumors and tumor risk in our study

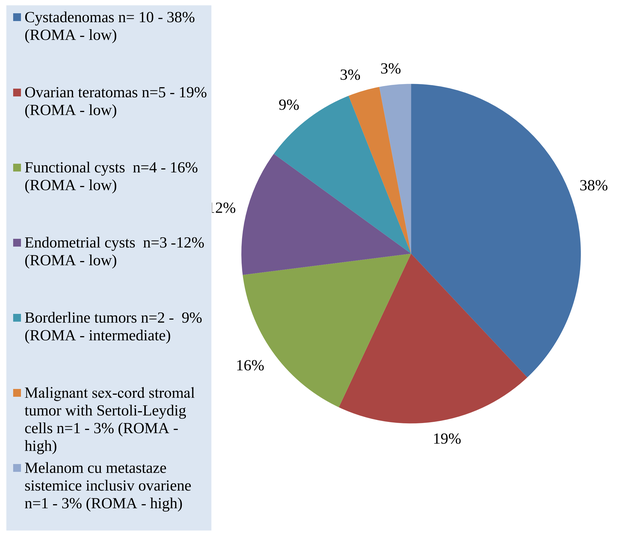


Fig. Assessment of potential tumor risk using the ROMA index through the Adnexal Mass Risk Prediction Models platform

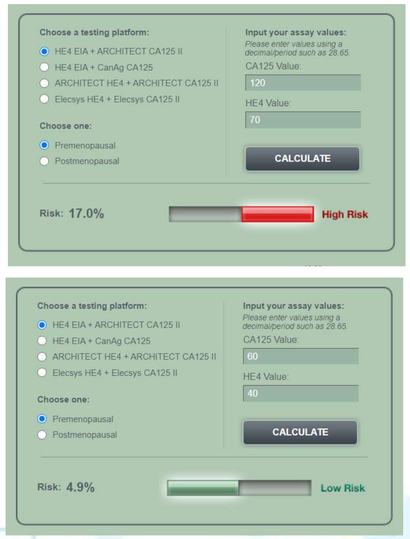
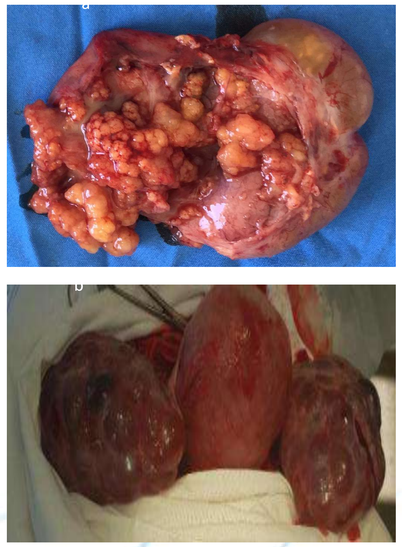


Fig. a - malignant ovarian tumor;
b – functional ovarian cyst - hyperreactio luteinalis



Results

Preoperatively for each case, the serological results of the tumor markers were computer-modulated.

Criteria for assessing the prognostic power for ROMA score served the histological result of the fragment removed intraoperatively.

To assess the sensitivity and specificity of ROMA algorithm with estimation of the prognostic power of aggressive tumor potential, borderline ovarian tumors were considered as potentially malignant.

The sensitivity and specificity of the ROMA algorithm in this research is almost similar to the results presented in literature: ROMA- sensitivity-87%; specificity-70%.

In the structure of the ovarian formations that included the histological analysis of n = 26 anatomosurgical pieces, we confirmed: 10 cases - 38% simple or mixed seromucinous cystadenomas; 5 cases - 19% of ovarian teratomas with embryonic tissue content - mainly hair, elements of cartilaginous tissue, neuronal and adipose tissue; 4 cases - 16% being functional cysts such as thecalutein cysts and yellow body ovarian cysts; 3 cases - 12% endometrial cysts were detected; also2 cases - 9% were borderline tumors and only one case constituting - 3% of the total group of ovarian formations analyzed was malignant sex-cord stromal tumor with Sertoli-Leydig cells; and one case - 3% of melanoma with systemic metastases including ovarian.

Conclusions

The ROMA algorithm suggests prognostic confidence, analyzing its sensitivity and specificity according to the results of our study.

It can serve as an essential argument for triage pregnant women with ovarian masses in the context of personalized approach and choice of pregnancy management.

The assessment of tumor risk through the ROMA algorithm is simple and can be easily implemented in daily practice in order to complement the diagnostic methods used at the stage of choosing personalized treatment.

References

1.Asima Mukhopadhyay, "Ovarian cysts and cancer in pregnancy," Best Pract. Res. Clin. Obstet. Gynaecol. xxx (2015, vol. 2, no. 1, pp. 1–24, 2015.

2. A. Carbonaro, R. Distefano, M. Stracquadanio, and F. G. C. L. and P. M, "Management of Adnexal Masses During Pregnancy: A Literature Review," J Gynecol Reprod Med, vol. 2, no. 4, pp. 1–10, 2018.

3. A. M. Hakoun, I. AbouAl-Shaar, K. J. Zaza, H. Abou-Al-Shaar, and M. N. A Salloum, "Adnexal masses in pregnancy: An updated review.," Avicenna J. Med., vol. 7, no. 4, pp. 153–157, 2017.

4. G. B. Sherard, C. A. Hodson, H. J. Williams, D. A. Semer, H. A. Hadi, and D. L. Tait, "Adnexal masses and pregnancy: a 12-year experience," Am. J. Obstet. Gynecol., vol. 189, no. 2, pp. 358–362, 2003.

5. G. Ruggeri et al., "HE4 and epithelial ovarian cancer: Comparison and clinical evaluation of two immunoassays and a combination algorithm," Clin. Chim. Acta, vol. 412, no. 15–16, pp. 1447–1453, 2011.

6. H. Marret et al., "Guidelines for the management of ovarian cancer during pregnancy," Eur. J. Obstet. Gynecol. Reprod. Biol., vol. 149, no. 1, pp. 18–21, 2010.

7. H. Stensheim, B. Møller, T. Van Dijk, and S. D. Fosså, "Cause-specific survival for women diagnosed with cancer during pregnancy or lactation: A registry-based cohort study," J. Clin. Oncol., vol. 27, no. 1, pp. 45–51, 2009.

8. J. Yazbek, R. Salim, B. Woelfer, N. Aslam, C. T. Lee, and D. Jurkovic, "The value of ultrasound visualization of the ovaries during the routine 11-14 weeks nuchal translucency scan," Eur. J. Obstet. Gynecol. Reprod. Biol., vol. 132, no. 2, pp. 154–158, Jun. 2007.

9. N. Behtash, M. Karimi Zarchi, M. Modares Gilani, F. Ghaemmaghami, A. Mousavi, and F. Ghotbizadeh, "Ovarian carcinoma associated with pregnancy: a clinicopathologic analysis of 23 cases and review of the literature.," BMC Pregnancy Childbirth, vol. 8, p. 3, 2008.

10. Nishat Fatema1, Muna Mubarak Al badi, and Zarrin Tasnim Moon, "Management and Outcomes of Ovarian Masses Measuring ≥5cm in Pregnancy - a Series of Six Cases," MOJ Clin. Med. Case Reports, vol. 5, no. 3, pp. 1–6, 2016.

11. T. Van Gorp et al., "HE4 and CA125 as a diagnostic test in ovarian cancer: Prospective validation of the Risk of Ovarian Malignancy Algorithm," Br. J. Cancer, vol. 104, no. 5, pp. 863–870, 2011.

12. Y. M. Kim et al., "Evaluation of the accuracy of serum human epididymis protein 4 in combination with CA125 for detecting ovarian cancer: A prospective case-control study in a Korean population," Clin. Chem. Lab. Med., vol. 49, no. 3, pp. 527–534, 2011.

13. Y. S. Kwon et al., "Ovarian cancer during pregnancy: clinical and pregnancy outcome.," J. Korean Med. Sci., vol. 25, no. 2, pp. 230–4, 2010.

14. S. N. Han, A. Lotgerink, M. M. Gziri, K. Van Calsteren, and M. H. and F. Amant, "Physiologic variations of serum tumor markers in gynecological malignancies during pregnancy: a systematic review," BMC Med., vol. 10, pp. 66–9, 2012.

15. С. А. Мартынов"Онкомаркеры их характеристика и некоторые аспекты клиникодиагностического использования" Проблемы репродукции, vol. 3, pp. 65–79, 2005.

16. Е. С. Ляшко, А. В. Николаева, Ю. И. Липатенкова, and Е. А. Кулабухова, "Хирургическое лечение беременных с опухолями и опухолевидными образованиями яичников," Гинекология, vol. Диагностик, no. 1, pp. 7–9, 2011.

17. С. А. Мартынов, "Акушерство и гинекология Гинекология - Современные онкомаркеры в дифференциальной диагностике опухолей яичников вне и во время беременности (обзор литературы)," Гинекология, vol. 04, pp. 63–67, 2014.

18. Л. В. Адамян, А. А. Попов, and А.В.Козаченко, "Беременность и доброкачественные опухоли яичников," АКУШЕРСТВО И ГИНЕКОЛОГИЯ новости, мнения, обучение, vol. №4, pp. 58–62, 2015.