New Day in Medicine
Новый День в Медицине
NDM

TIBBIYOTDA YANGI KUN

Ilmiy referativ, marifiy-ma'naviy jurnal

AVICENNA-MED.UZ

ISSN 2181-712X.
EiSSN 2181-2187

12 (62) 2023

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НОВЫЙ ДЕНЬ В МЕДИЦИНЕ

NEW DAY IN MEDICINE

Илмий-рефератив, маънавий-маърифий журнал
Научно-реферативный,
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УЧРЕДИТЕЛИ:

БУХАРСКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ ИНСТИТУТ
ООО «ТИББИЁТДА ЯНГИ КУН»

Национальный медицинский исследовательский центр хирургии имени А.В. Вишневского является генеральным научно-практическим консультантом редакции

Журнал был включен в список журнальных изданий, рецензируемых Высшей Аттестационной Комиссией Республики Узбекистан (Протокол № 201/03 от 30.12.2013 г.)

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12 (62)

2023

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Received: 20.11.2023, Accepted: 27.11.2023, Published: 10.12.2023.

UDK 618.53-06- 07:618.3

DIAGNOSING THE SEVERITY OF PREECLAMPSIA

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✓ ***Resume***

Preeclampsia, according to the World Health Organization, complicates pregnancy in 8-26% of cases and is one of the main causes of maternal and perinatal mortality. The purpose of the study was to evaluate the prognostic significance of the biochemical markers homocysteine, lactate dehydrogenase(LDH), reactive protein C and vitamin D using ROC analysis in preeclampsia of varying degrees. Material and methods. A prospective study included 105 patients with preeclampsia and 31 physiologically ongoing pregnancies. A general clinical and laboratory examination of pregnant women was carried out. Results. The results of the study and according to the ROC curve showed a high value of LDH determination (AUC=0.97) (sensitivity=95.9%; specificity=93.5%). and C-reactive protein(CRP) (AUC=0.96) (sensitivity=97.3%; specificity=96.8%) in the diagnosis of the disease. 77.2%). Conclusion. The developed model for predicting preeclampsia can be used in the work of a practicing obstetrician-gynecologist

Key words: preeclampsia, ROC analysis, predictors

ДИАГНОСТИКА ТЯЖЕСТИ ПРЕЭКЛАМПСИИ

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✓ ***Резюме***

Преэклампсия, по данным Всемирной организации здравоохранения, осложняет течение беременности в 8-26% случаев и является одной из основных причин материнской и перинатальной смертности. Цель исследования - оценить прогностическую значимость биохимических маркеров гомоцистеина, лактатдегидрогеназы (ЛДГ), реактивного белка С и витамина D с помощью ROC-анализа при гестозе различной степени. Материал и методы. В проспективное исследование включены 105 пациенток с преэклампсией и 31 физиологически продолжающаяся беременность. Проведено общее клинико-лабораторное обследование беременных. Полученные результаты. Результаты исследования и по ROC-кривой показали высокое значение определения ЛДГ (AUC=0,97) (чувствительность=95,9%; специфичность=93,5%). и С-реактивный белок (СРБ) (AUC=0,96) (чувствительность=97,3%; специфичность=96,8%) при диагностике заболевания. 77,2%). Заключение. Разработанная модель прогнозирования преэклампсии может быть использована в работе практикующего врача акушера-гинеколога.

Ключевые слова: преэклампсия, ROC-анализ, предикторы.

PREEKLAMPSIYANING OG'IRLIGINI DARAJASINI TASHXISLASH

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✓ ***Rezume***

Jahon sog'liqni saqlash tashkiloti ma'lumotlariga ko'ra, preeklampsiya 8-26% hollarda homiladorliklarda kuzatiladi va onalar va perinatal o'limning asosiy sabablaridan biri bo'lib hisoblanadi. Tadqiqotning maqsadi turli darajadagi preeklampsiyada ROC tahlilidan foydalangan holda gomosistein, laktat degidrogenaza (LDG), C reaktiv oqsil va D vitamini kabi biokimyoviy markerlarining prognostik ahamiyatini baholash. Materiallar va usullar. Tadqiqotda preeklampsiya bilan og'rigan 105 bemor va fiziologik kechgan 31 nafar homiladorlar ishtirok etdi. Homilador ayollar umumiy klinik va laboratoriya tekshiruvi o'tkazildi. Natijalar. Tadqiqot natijalari va ROC egri chizig'iga ko'ra LDG ni aniqlashning yuqori qiymatini ko'rsatdi (AUC=0,97) (sezuvchanlik=95,9%; o'ziga xoslik=93,5%). va kasallik diagnostikasida C-reaktiv oqsil (CRO) (AUC=0,96) (sezuvchanlik=97,3%; o'ziga xoslik=96,8%). 77,2%). Xulosa. Preeklampsiyani bashorat qilish uchun ishlab chiqilgan model akusher-ginekologlar amaliyotida qo'llanilishi mumkin.

Kalit so'zlar: preeklampsiya, ROC tahlili, prediktorlar

Relevance

Preeclampsia (PE) according to the World Health Organization (WHO) complicates the course of pregnancy in 8-26% of cases and is one of the main causes of maternal and perinatal mortality[5,11]. According to the Confidential Audit of Maternal Mortality(MM) conducted in developed countries (for example, in the UK - the maternal mortality rate from preeclampsia / eclampsia is 0.42 per 100,000 live births, in the USA the MM level is 7.5 per 100,000 live births) and in developing countries (for example , in African countries - the level of MM - 98 per 1000 live births) in 90% of cases, mortality was preventable, in 80% of cases, the cause of MM was incorrect diagnosis and treatment[4,8,10]. In addition to maternal morbidity and mortality, preeclampsia is one of the main causes of early delivery, and hence the morbidity of newborns associated with preterm birth[3,7,9]. The risk of preterm delivery in PE, according to the WHO secondary analysis, increases by 8 times [2]. Perinatal mortality (PM) in preeclampsia in the world ranges from 9 to 20.0‰, perinatal morbidity in them is 463-780‰[1,6].

Purpose of the study. Using ROC analysis, to evaluate the prognostic significance of the biochemical markers homocysteine, lactate dehydrogenase, C reactive protein and vitamin D in preeclampsia of varying degrees.

Material and methods

A prospective study was conducted on the basis of the regional Perinatal Center (Uzbekistan, Bukhara) and the laboratory of the medical center "Bukhoro tibbiy diagnostica". To achieve this goal, 105 women with preeclampsia and 31 conditionally healthy pregnant women were examined. The study plan complied with the legislation of the Republic of Uzbekistan. Diagnostic criteria for mild and severe preeclampsia were elevated blood pressure (≥140/90 mmHg and ≥160/110 mmHg, respectively), daily proteinuria, or a combination of one or more threatening symptoms, such as severe persistent headaches. pain, epigastric pain, oliguria, blurred vision, shortness of breath, and with eclampsia - convulsions. Informed written consent of the patient to participate in the study.

For the study, laboratory tests were performed (general blood count and biochemical blood test (homocysteine, LDH, C reactive protein and vitamin D), as well as a urine test for the presence of protein), ultrasound. The general exclusion criteria from the study were the presence of oncological diseases, tuberculosis, severe somatic pathology, mental illness, and multiple pregnancy.

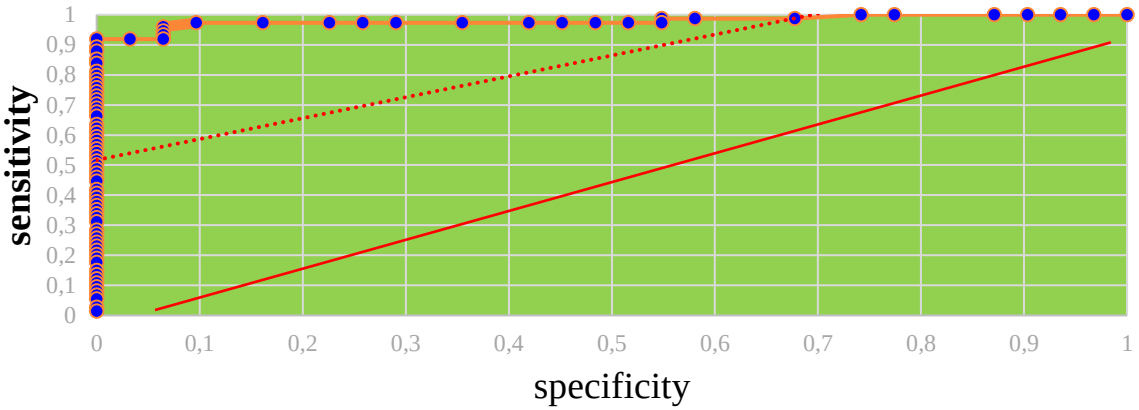
In order to identify the most significant clinical, laboratory and instrumental factors in the prognosis of severe preeclampsia, ROC analysis (receiver operating characteristic) was used using ROC curves. The ROC curve is a graph that allows you to evaluate the quality of a binary classification, showing the ratio between the proportion of objects from the total number of trait carriers that are correctly classified as bearing the trait (sensitivity), and the proportion of objects from the total number of objects that do not carry the trait, erroneously classified as bearing the trait (specificity). classification algorithm) by varying the threshold of the decision rule.

The quantitative interpretation of ROC is given by the AUC indicator (eng. area under ROC curve) - the area bounded by the ROC curve and the axis of the proportion of false positive classifications, which is equivalent to the probability that the classifier will assign more weight to a randomly selected

positive entity than to a randomly selected negative one. At the same time, the value of 0.5 demonstrates the unsuitability of the selected classification method. In accordance with the classification of J. Swets, the area under the ROC curve from 0.5 to 0.7 indicates a low accuracy of the test, a test with an area under the ROC curve from 0.7 to 0.9 can be used in practice and the area under the ROC curve higher than 0.9 characterizes a test with high accuracy [10].

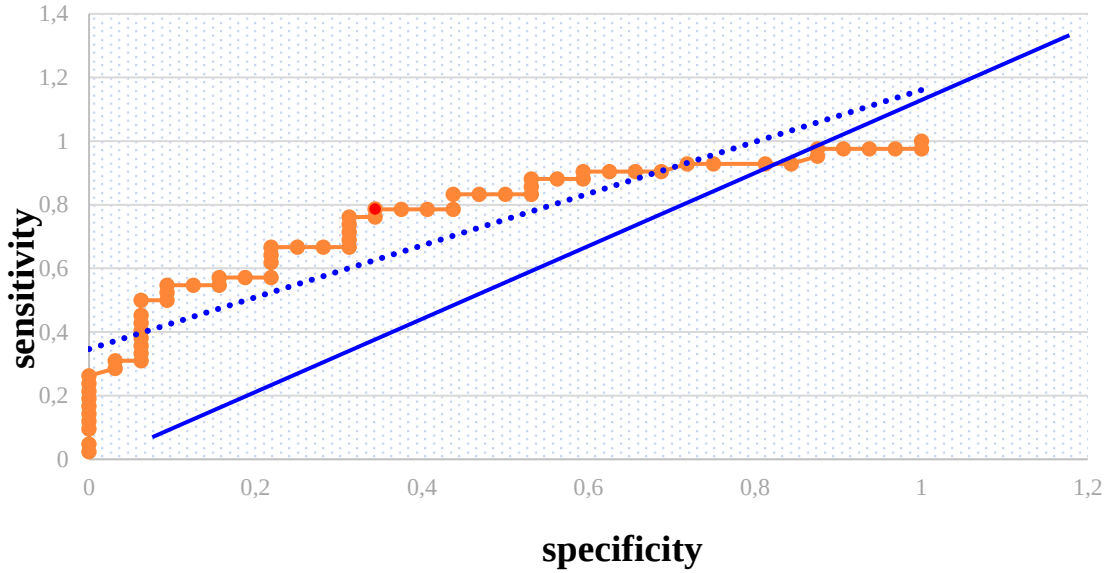
Results and discussion

The results of biochemical analyzes showed the level of LDH in the group with severe PE (701±42.8 U/l) was 2.63 times ($p<0.001$) higher than in the comparison group (266±12.7 U/l).



Picture 1. ROC-curve of the indicator "LDH" in the diagnosis of preeclampsia.

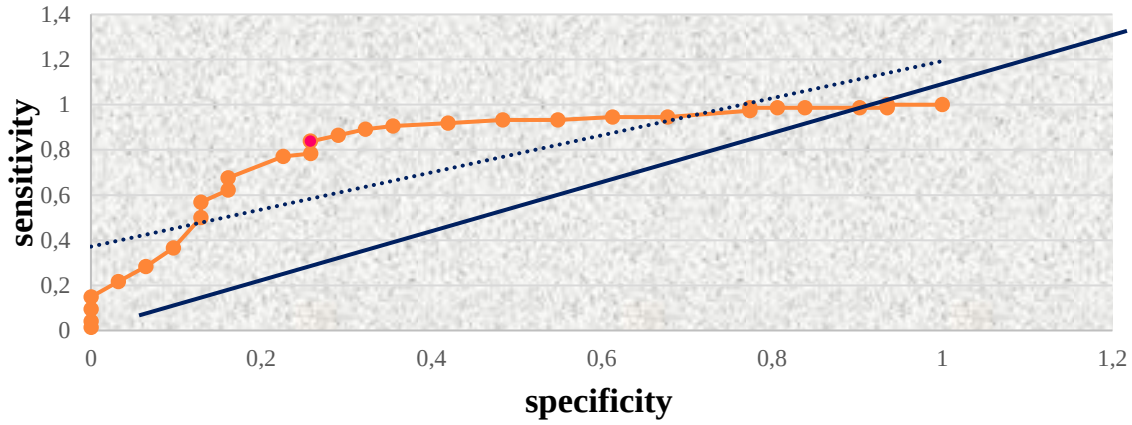
In Pic 1. the ROC-curve of the change in the indicator is presented to determine the diagnostic significance of LDH; sensitivity=95.9%; specificity = 93.5%). With an increase in LDH above 250 IU / l, there is an increase in the risk of the disease by 2.14 times for every 10 IU / l.



Picture 2. ROC-curve of the indicator "LDH" in the diagnosis of the severity of preeclampsia.

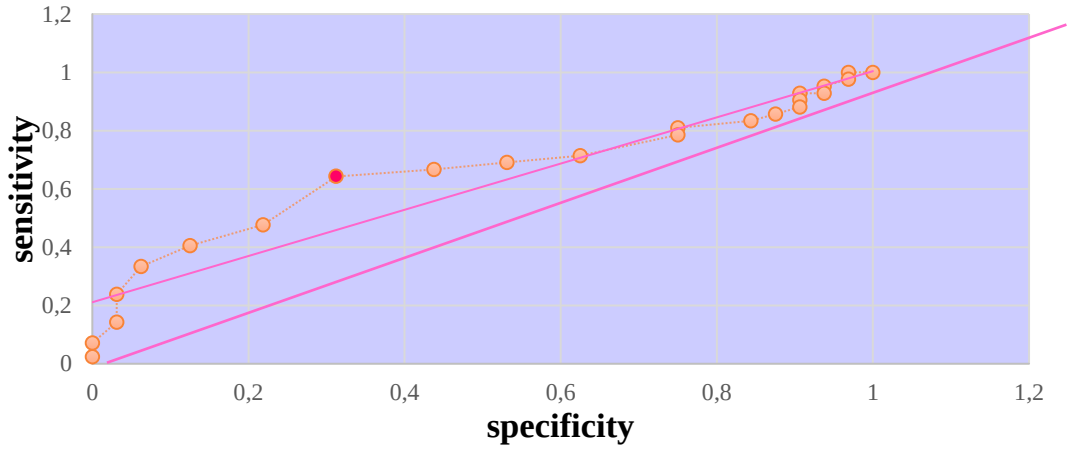
As can be seen from Pic.2. The ROC analysis performed to determine the diagnostic significance of LDH in determining the severity of the disease showed a relatively lower value of determining the LDH (AUC = 0.62) in diagnosing the severity of the disease, since LDH concentration >560 U/l indicates the risk of a severe course of the disease (sensitivity = 78.6%; specificity = 65.6%).

The level of vitamin D in the plasma of pregnant women with severe preeclampsia was (13.8 ± 0.89 ng / ml), in women with a physiologically ongoing pregnancy, the concentration of vitamin D in the blood was (24.7 ± 1.57 ng / ml).



Picture 3. ROC-curve of the indicator "Vitamin D" in the diagnosis of preeclampsia.

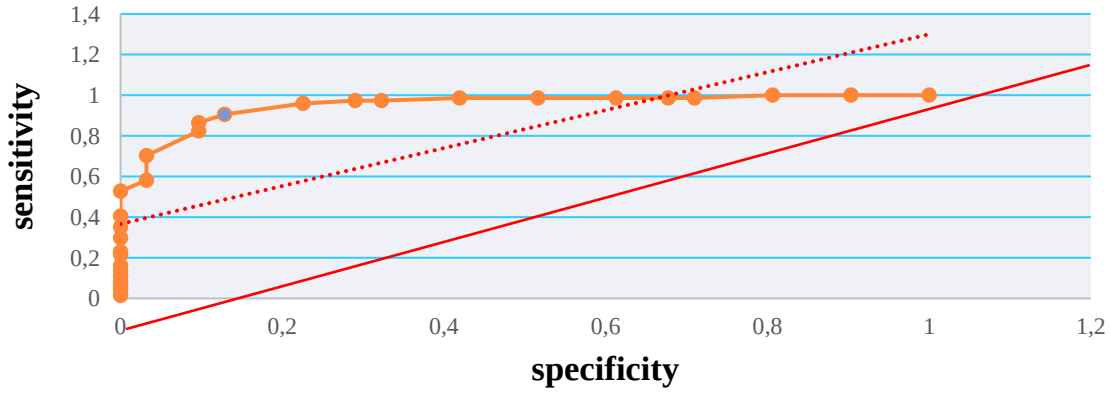
In Pic.3. the ROC-analysis performed to determine the diagnostic significance of Vitamin D is presented; 5%; specificity=71.0%). With a decrease in the level of Vitamin D <30 ng / ml, there is an increase in the risk of disease by 26% for every 1 ng / ml.



Picture 4. ROC-curve of the "Vitamin D" indicator in the diagnosis of the severity of the disease.

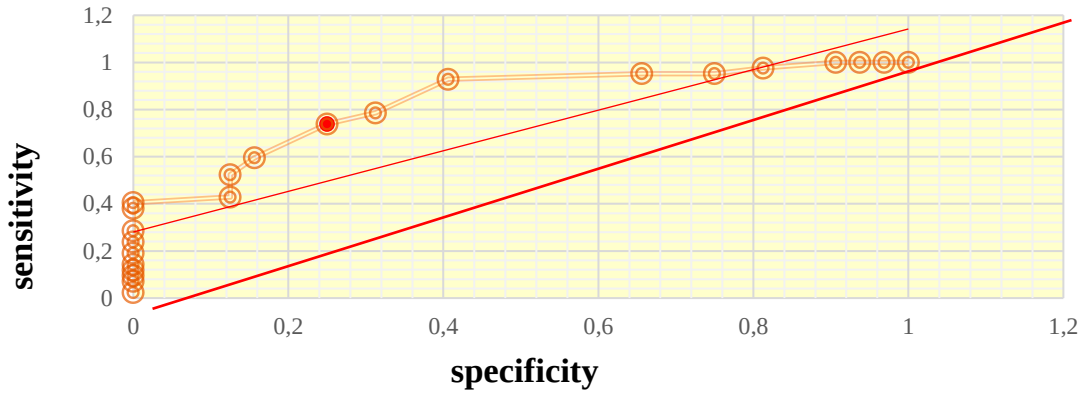
The ROC analysis performed to determine the diagnostic significance of Vitamin D in determining the severity of the disease showed (Pic. 4.) a relatively low value of determining Vitamin D (AUC = 0.52) in diagnosing the severity of the disease, since the concentration of Vitamin D<13 ng/ ml indicates the risk of severe disease (sensitivity=64.3%; specificity=68.9%).

The level of homocysteine concentration in pregnant women with severe preeclampsia was 24.7±1.14 μmol/l, in women with mild PE 18.8±0.7 μmol/l in the control group was 11.6±0.7 μmol/l.



Picture 5. ROC-curve of the "homocysteine" indicator in the diagnosis of preeclampsia.

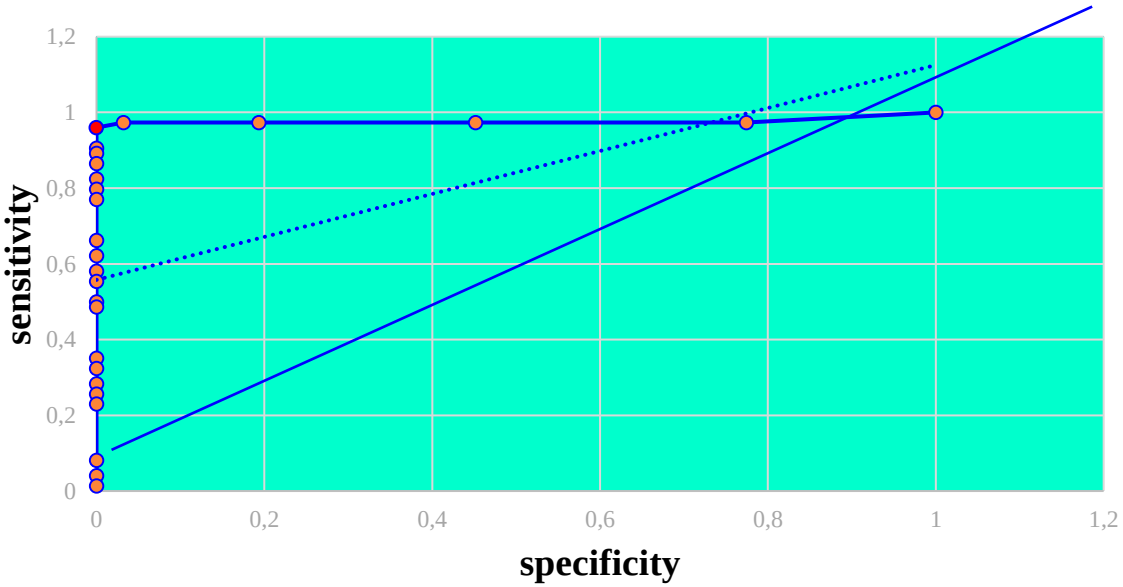
On Pic.5. the ROC analysis performed to determine the diagnostic significance of homocysteine was shown, showed the high value of homocysteine determination (AUC=0.88) in the diagnosis of the disease, so the concentration of homocysteine>17 μmol/l indicates a high risk in the development of the disease (sensitivity=90.5%; specificity=87.1%). With an increase in homocysteine \u003e 7 μmol / l, there is an increase in the risk of disease by 69.8% for every μmol / l.



Picture 6. ROC-curve of the "homocysteine" indicator in the diagnosis of the severity of preeclampsia.

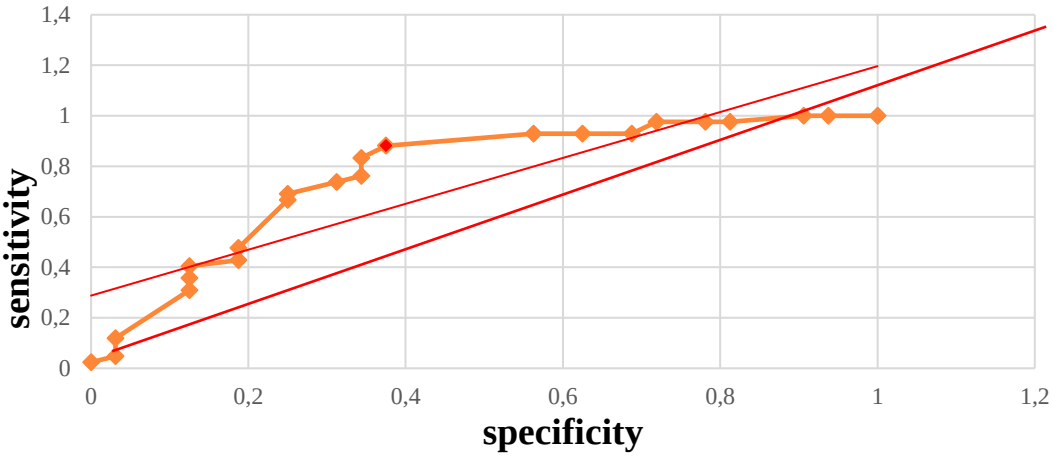
The ROC analysis performed to determine the diagnostic significance of homocysteine in determining the severity of the disease showed a relatively significant value of the determination of homocysteine (AUC = 0.74) in diagnosing the severity of the disease, since the concentration of homocysteine >22 μmol/l indicates the risk of a severe course of the disease (sensitivity =73.7%; specificity=75.0%). With an increase in homocysteine \u003e 18 μmol / l, there is an increase in the risk of severe disease by 75% for every 1 μmol / l.

The amount of CRP in the plasma of pregnant women with severe PE was 45.12 ± 1.5 U/l, and in the control group it was 5.23 ± 0.2 U/l. The concentration of CRP in the blood of pregnant women with mild PE is 23.0 ± 2.3 U/L.



Picture 7. ROC-curve of the indicator "CRP" in the diagnosis of preeclampsia.

The ROC analysis performed to determine the diagnostic significance of C-reactive protein showed a high value of determining C-reactive protein (AUC = 0.96) in the diagnosis of the disease, since the concentration of C-reactive protein> 8 nmol / l indicates a high risk in the development of the disease (sensitivity=97.3%; specificity=96.8%). With an increase in the level of C-reactive protein> 4 nmol / l, there is an increase in the risk of the disease by 7.56 times for every 1 nmol / l.



Picture 8. ROC-curve of the "CRP" indicator in the diagnosis of the severity of preeclampsia.

The ROC analysis performed to determine the diagnostic significance of CRP in determining the severity of the disease showed a relatively low value of determining C-reactive protein (AUC = 0.63) in diagnosing the severity of the disease, since the concentration of C-reactive protein> 28 nmol / l indicates risk of severe disease (sensitivity=83.3%; specificity=65.6%).

Conclusion

1. The results of the study and according to the ROC-curve showed a high value of LDH determination (AUC=0.97) (sensitivity=95.9%; specificity=93.5%). and C-reactive protein (AUC=0.96) (sensitivity=97.3%; specificity=96.8%) in the diagnosis of the disease.
2. The most significant value was shown by the determination of homocysteine (AUC = 0.74) in the diagnosis of the severity of the disease, since the concentration of homocysteine >22 μmol/l indicates the risk of a severe course of the disease (sensitivity = 73.7%; specificity = 75.0%).

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Entered 20.11.2023