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Chronic diseases of the respiratory system during pregnancy. Approaches to diagnosis and treatment

Ключевые слова: кашель, беременность, муковисцидоз.

Rates of maternal and infant mortality are indicators of socio-economic well-being of the country and their reduction is included in the list of main Millennium Development Goals defined by the United Nations. The main causes of maternal and infant loss both in Ukraine and in the world are serious diseases of women, not directly related to pregnancy [5].

In connection with the reform of the health system, family physicians play a key role in pregnancy management. These specialists perform primary contact with the woman, watch her throughout the pregnancy and are the first to face the diagnosis and treatment of non-obstetric coexisting pathology.

Unfortunately, the state of health in women of childbearing age remains unsatisfactory and many already have a number of chronic diseases by the time of conception. According to Department of health in Dnipropetrovsk region, each year more than 25 thousand delivery occurs in women with somatic diseases, of which 20 % have a severe course [4].

Due to an increasing number of pregnancies that develop against the background of clinically significant pathology, one of the steps of the health reform was establishment of perinatal centers and specialized departments of pathology of pregnancy. Which have resources to provide proper care for women with complicated pregnancy. However, in real life practice, most pregnant arrive at

specialized departments with decompensation or complications of the disease that have been treated by family physician.

In our opinion, one of the reasons for this situation is the lack of clear guidelines on non-obstetric coexisting pathology for general practitioners and family physicians. Terms and amount of consultations of related specialists as well as principles of hospitalization to specialized departments are not clearly determined by any guideline.

According to data from 2004–2008 yrs. leading position among the diseases that complicate pregnancy took cardiovascular diseases (40.5 %), followed by infections (29.4 %) and neoplasms (19 %) [2].

However, the pandemic influenza A H₁N₁ has changed the structure of the non-obstetric coexisting pathology, increasing maternal mortality by 24 %. It also stressed that pregnant with chronic respiratory diseases (CRD) are at risk for severe pneumonia and acute respiratory failure [7, 9, 10].

The ability of respiratory system to provide an adequate gas exchange is especially important during pregnancy, since the oxygen consumption in this period increases by 15–20 % [3]. To meet that need a number of structural and functional changes occur and increase the load on respiratory system. On this background, CRD can change their clinical course and become severe.

That is why we would like to focus on CRD as a risk factor for severe respiratory failure and morbidity of respiratory infections.

Materials and methods.

The study was conducted in diagnostic cabinet “Spiro” and the Department of Pathology of pregnancy in the period from 2013 to 2015 yrs. During that time, we observed 112 pregnant that required consult of pulmonologist. They were divided into two main groups: Group I – women with acute respiratory pathology (n = 67) and Group II – women with CRD (n = 45).

Results and discussion

In Group I prevailed pregnant with community-acquired pneumonia (n = 45) and acute bronchitis (n = 10). To this group we also included women with leading complaint on prolonged cough (n = 12), with unknown diagnosis at the time of referral.

There are no clear recommendations on the management of pregnant with prolonged cough, in contrast to pneumonia and bronchitis. For that reason we decided to show one of the algorithms of diagnostic and treatment tactics, which was used in our patients.

Pregnant with complaints on prolonged (3 weeks or more) cough, according to the results of spirometry were divided into two subgroups: subgroup A – women with normal respiratory function and subgroup B – women with impaired respiratory function (obstructive type).

In subgroup A causes of cough were postnasal drip and use of unreasonably large number of mucolytics and expectorants.

Postnasal drip – a number of clinical situations in which as a result of the inflammatory process in the nasal cavity, paranasal sinuses, nasopharynx or without apparent cause discharge from the nose runs down the back of the throat into the lower respiratory tract [1]. The main complaint of these patients is cough, mainly in the evening or at night, which leads to misdiagnosis diagnosis of asthma or chronic bronchitis. Therefore, the differential diagnosis should involve a consult of otolaryngologist.

Overuse of self-administered mucolytics and expectorants is the second leading cause of prolonged cough. Collecting patient's history reveals simultaneous use of three or more different groups of mucolytics. Against the background of such therapy, excess phlegm accumulates in bronchi and leads to airway hyper reactivity, which imitates symptoms of asthma or bronchitis. Canceling unnecessary drugs leads to regression of symptoms within 5–7 days. If not, the spirometry with the test on airflow obstruction reversibility it is recommended.

Pregnant in subgroup B had a history of smoking and frequent (two or more per year) pneumonias. Their spirometry met criteria for a diagnosis of COPD. On the background of bronchodilator therapy lung function improved significantly and pregnancy developed without further complications. The fact that patients of subgroup B were primary diagnosed in gestation period emphasizes that pregnancy is a condition that not only unmasks previously undiagnosed pulmonary pathology but also draws more attention of physicians to respiratory complaints.

It should be noted, that a prolonged cough is not a reason for prescribing antibiotics

Algorithm of diagnostic search applied in subgroups A and B and its results are presented in Table 1.

Group II consisted of pregnant with asthma (n = 34), cystic fibrosis (n = 5) and congenital malformations of the lungs (n = 6).

Asthma is the most common chronic respiratory disease complicating pregnancy. Strategies of its management in gestation period are well known and described in international guidelines. Therefore, we decided to pay more attention to the more rare diseases such as cystic fibrosis (CF) and congenital malformations of the lungs.

Cystic fibrosis in the background of pregnancy

Due to modern medications and management strategies, the survival in patients with cystic fibrosis (CF) improved significantly. The mean life expectancy for women of child-bearing age, according to data of the Federal State Institution “Research Institute of Pulmonology of FMBA of Russia” is 31 years [3]. According to Fitzsimmons S. et al., 2006, pregnancy occurs in 4% of women with CF annually [8]. These data underline the topicality of management of this group of women during gestation.

If in the sixties the diagnosis of CF could be considered as an indication for termination of pregnancy, nowadays experts agree that pregnancy with successful completion is possible, but only on the background of basic treatment and its modification according to physiological changes.

Possible negative impact of pregnancy on subsequent survival and respiratory function are still a matter of dispute. Recent data published by Ahluwalia M. et al., 2014 in Journal of Cystic Fibrosis, showed the results of a case-control observation of 22 pregnant women with CF throughout the gestation and 4,5 years after birth. Study revealed no significant differences in life expectancy, respiratory function and frequency of exacerbations with control group, which consisted of women with CF that never got pregnant [6].

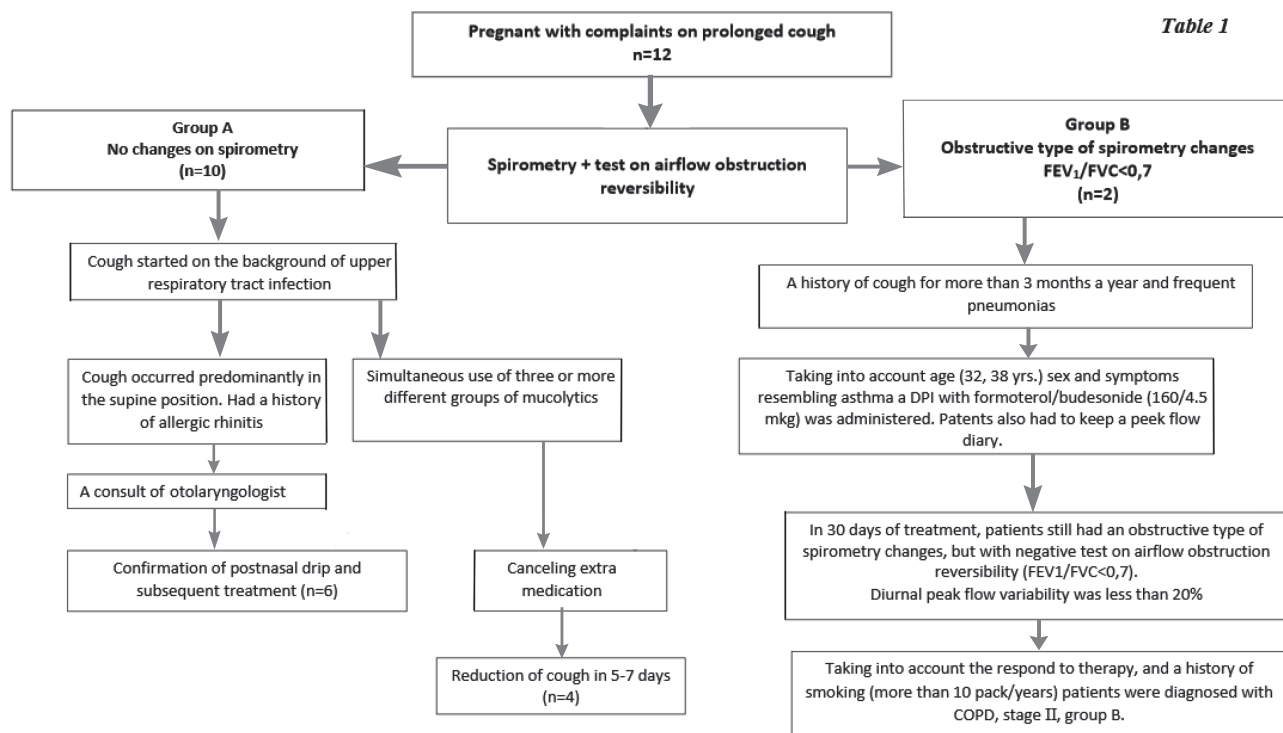
During the period from 2010 to early 2015 five of registered at our clinic women with CF became pregnant and only one attended observations throughout gestation period. With her clinical case as an example, we will demonstrate the particular features of CF during pregnancy.

Patient A., 18 years old, diagnosed with mixed form of cystic fibrosis of moderate severity and bronchial obstruction syndrome. Treatment prior pregnancy was multienzymes 150 thousands units daily and indacaterol 150 micrograms for bronchial obstruction. At first examination of pulmonologist in gestation term of 18 weeks, patient had BMI 18.5 kg/m² and normal respiratory function (Fig. 1). She was prescribed to continue treatment with same doses of enzymes and bronchodilators.

In term of 24 weeks, patient had an exacerbation that developed on the background of upper respiratory tract infection, with no high fever (37 °C) and predominance of bronchial obstruction syndrome (Fig. 2).

Exacerbation was treated with enhanced inhalation therapy – salbutamol + budesonide 0.25 mg/ml three times per day by nebulization for ten days.

Table 1



In ten days of treatment, spirometry showed an improvement of lung function with positive test on airflow obstruction reversibility (Fig. 3). In this regard, a dry powder inhaler with formoterol/budesonide (160/4.5 mkg) one inhalation twice daily and on-demand (SMART) was prescribed as a basic therapy.

Spirometry in term of 37 weeks revealed no violations of respiratory function and patient continued previously prescribed treatment.

In cooperation with obstetrician a birth plan with the exception of bearing-down period was developed. Pregnancy ended with the birth of a boy, (weight 2900 g, length of 52 cm) and Apgar scores 8 and 9 points.

Patient A. came on readmission in three months after birth. Spirometry showed a slight decrease of lung function, which was eliminated by correction of inhalation therapy.

Please note that both correction of inhalation therapy and treatment of exacerbations were conducted with the participation of a pulmonologist and after spirometry. During pregnancy, our patient had no manifestations of exocrine pancreatic insufficiency, so there was no need for gastroenterologist consults. While in the presence of symptoms, his advice is required to revise the dosing multienzymes.

Pregnant with congenital lung development malformations

In our clinic, we had observed six pregnant who underwent removal of the lung lobe or segment in connection with congenital disorders of respiratory system: pulmonary hypoplasia ($n = 3$), bullous disease ($n = 2$) and bronchiectasis ($n = 1$) throughout gestation period.

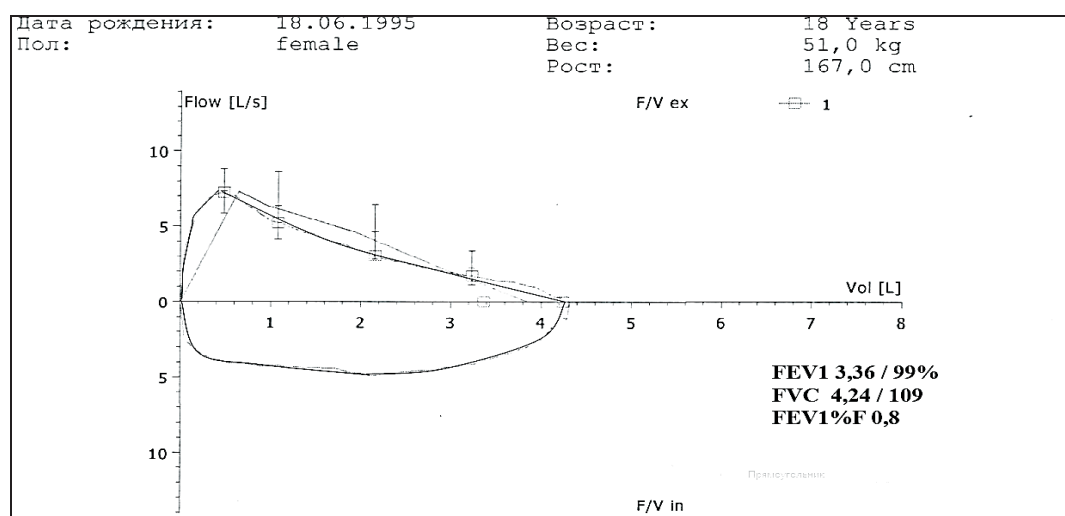


Figure 1. Spirometry of patient A. before pregnancy

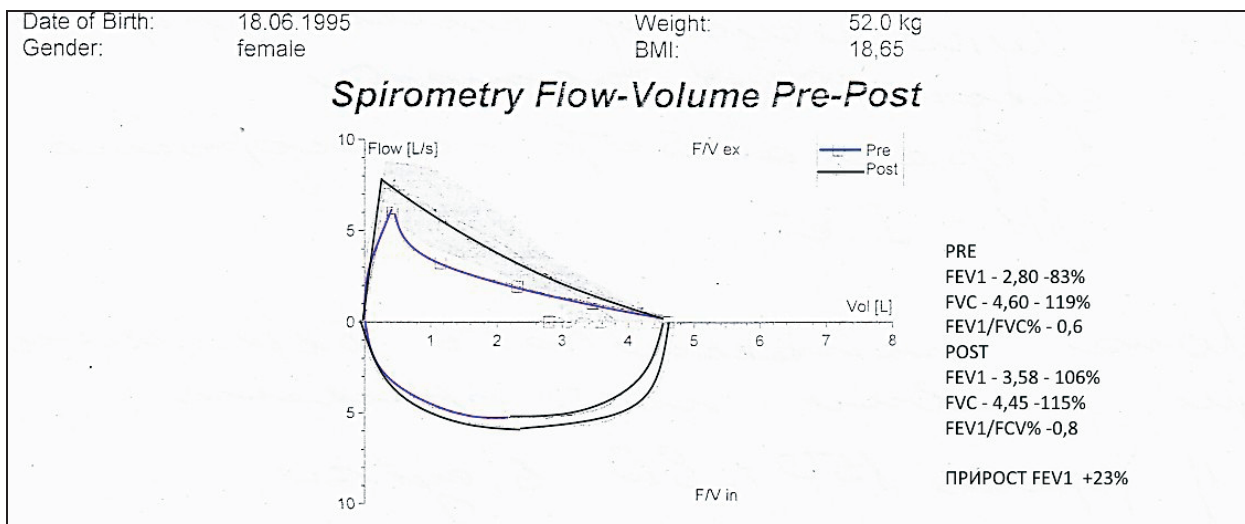


Figure 2. Spirometry of patient A. on the background of exacerbation

To develop a birth plan this patients need a pulmonologist consult and lung function testing. It should be noted that a history of surgical correction of congenital lung development does not necessarily indicate changes of lung volumes.

One of the features of work with this group of patients is the complexity of getting a full medical history, as the diagnosis and surgical treatment are carried out in early age. When moving from child to adult medical services, women often lose medical records and, in the absence of respiratory complaints are not observed by pulmonologists.

The main direction in the treatment of this group of pregnant is to identify violations of respiratory function and correct them, in most cases with bronchodilators. In our practice, we used salbutamol or ipratropium bromide + fenoterol in metered dose inhalers or nebulized.

Pregnant with congenital lung development malformations are observed by family physician, with compulsory

spirometry and pulmonologist consult in the early terms and before delivery.

Lower respiratory tract infections or symptoms of disease decompensation require monitoring of oxygen saturation and lung function with subsequent pulmonologist consult. These will help to make a timely decision on transfer of pregnant to a specialized hospital.

Conclusions

Pregnancy can unmask previously undiagnosed or compensated respiratory pathology, because of the physiological changes that increase the load on the respiratory system. Principals of continuity and integrity of health care are of great importance in treatment of pregnant women with chronic respiratory pathology. To get an appropriate consultation in hospitals of second and third levels the primary link of healthcare should provide a full medical record of women.

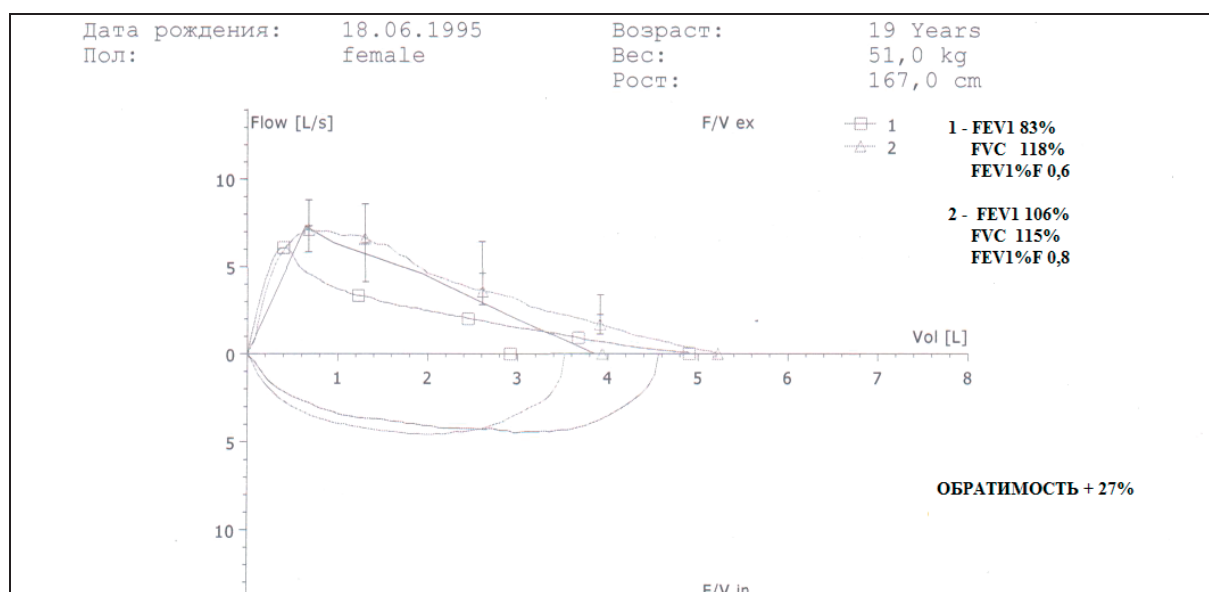


Figure 3. Spirometry of patient A. on day ten of exacerbation treatment

The key role in pregnancy management plays a family physician, but in case of women with chronic respiratory disease a participation of pulmonologist with pulmonary function testing are essential. This cooperation helps to determine the management strategy of patients during gestation and to minimize risk of complications.

In absence of exacerbations or respiratory complaints pregnant with chronic pulmonary disease should perform spirometry and pulmonologist consult in gestation terms of 12–18 weeks, 22–24 weeks, and 32–36 weeks.

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ХРОНІЧНІ ЗАХВОРЮВАННЯ ДИХАЛЬНОЇ СИСТЕМИ У ВАГІТНИХ: ПІДХОДИ ДО ДІАГНОСТИКИ ТА ЛІКУВАННЯ

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Резюме

Вагітність — стан організму, на фоні якого під впливом фізіологічних змін, що підвищують навантаження на дихальну систему, може проявлятися раніше не діагностована або компенсована патологія дихальної системи (ДС). Тому актуальними є питання диференціальної діагностики респіраторних скарг у вагітних і ведення хронічної патології органів дихання у гестаційний період.

Мета: продемонструвати підходи до ведення вагітних з хронічною патологією ДС як до групи ризику розвитку тяжкої дихальної недостатності і ускладненого перебігу респіраторних інфекцій.

Матеріали та методи дослідження. Було обстежено 112 вагітних, яких можна розділити на дві основні групи: група I — жінки з гострою патологією ДС ($n = 67$), група II — жінки з хронічною патологією ДС ($n = 45$). У кожній групі було виділено підгрупи хворих з найменш поширеною і діагностично складною патологією. У групі I — вагітні зі скаргами на тривалий кашель, у групі 2 — вагітні з муковісцидозом та вродженими вадами розвитку легень. Усім вагітним у виділених підгрупах проводилися клінічна оцінка загального стану, визначення сатурації та функції зовнішнього дихання (спірографія з пробою з бронхолітиком за показаннями).

Результати та їх обговорення. В результаті проведеного дослідження було встановлено, що найбільш поширеними причинами тривалого кашлю у вагітних були постназальний синдром і поліпрагмація при лікуванні гострого бронхіту. Однак у двох хворих з тривалим курінням і частими інфекціями нижніх дихальних шляхів в анамнезі було вперше виявлено незворотні зміни ФЗД за обструктивним типом.

Основними напрямками в веденні вагітних з муковісцидозом та вродженими вадами розвитку легень є виявлення порушень функції зовнішнього дихання та їх корекція препаратами групи бронхолітиків.

При веденні вагітних з хронічною патологією бронхолегеневої системи важливо дотримуватися принципів послідовності та цілісності надання медичної допомоги, а саме — надання первинною ланкою повної медичної документації при направленні вагітних на консультацію в стаціонари другого і третього рівнів.

Ключові слова: кашель, вагітність, муковісцидоз.

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CHRONIC DISEASES OF THE RESPIRATORY SYSTEM DURING PREGNANCY: APPROACHES TO DIAGNOSIS AND TREATMENT

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Summary

Pregnancy due to its physiological changes that increase the load on the respiratory system can reveal previously undiagnosed or compensated respiratory pathology. Therefore, the question of differential diagnosis of respiratory complaints in pregnancy and maintenance of chronic diseases of the respiratory system in gestational period are of great importance.

Aim: to demonstrate approaches to management of pregnant women with chronic pathology of the respiratory system as a risk group for respiratory failure and complicated course of respiratory infections.

Materials and methods. The study involved 112 pregnant women, which were divided into two main groups: Group I — woman with acute pathology of respiratory system (RS) ($n = 67$) and Group II — women with chronic diseases of RS ($n = 45$). In each group a subgroup of patients with the most uncommon and complex diagnostic pathology were identified. In Group I — pregnant women with complaints of prolonged cough, in Group 2 — pregnant with cystic fibrosis and congenital

malformations of the lungs. All pregnant in selected subgroups were clinically assessed and tested for saturation and respiratory function (spirometry with use of bronchodilator if needed).

Results and discussion. The study it showed that the most common causes of prolonged cough in pregnant women were postnasal syndrome and polypharmacy in the treatment of acute bronchitis. However, two patients with a history of long-term smoking and frequent lower respiratory tract infections had irreversible obstructive changes of lung function.

The main directions in the conduct of pregnant women with cystic fibrosis and congenital malformations of the lungs are to identify violations of lung function and their correction with bronchodilators.

Principals of continuity and integrity of health care are very important in treatment of pregnant women with chronic broncho-pulmonary

pathology. To get an appropriate consultation in hospitals of second and third levels the primary link of health care should provide a full medical record of women.

Key words: cough, pregnancy, cystic fibrosis.

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