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DERLEME
REVIEW

Management of parapneumonic effusion in pregnant women

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SUMMARY

Management of parapneumonic effusion in pregnant women

Pneumonia and parapneumonic effusion (PPE) are not more common in pregnant women compared to normal population. Pneumonia is considered the second most common infection in pregnant women. PPE is a serious complication of pneumonia and occurs especially in case of treatment delay or inappropriate antibiotic selection. The data on the management of PPE in pregnant women is limited to few case reports.

Key words: *Pneumonia, parapneumonic effusion, pleura, pleural effusion, pregnancy, pregnant*

ÖZET

Gebe kadınlarda parapnömonik efüzyonun yönetimi

Pnömoni ve parapnömonik efüzyon (PPE)'un görülme sıklığı gebe kadınlarda normal popülasyona kıyasla daha fazla değildir. Pnömoni gebe kadınlarda en sık ikinci enfeksiyon olarak kabul edilir. PPE pnömoninin önemli bir komplikasyonudur ve özellikle tedavinin geciktiği veya antibiyotik seçiminin uygun olmadığı olgularda görülür. Gebe kadınlarda PPE yönetimi konusundaki veriler bir kaç olgu sunumu ile kısıtlıdır.

Anahtar kelimeler: *Pnömoni, parapnömonik efüzyon, pleval efüzyon, plevra, gebelik*

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Pneumonia is an important cause of mortality and morbidity in all age groups. It is of critical importance to start appropriate treatment as soon as possible. Otherwise, progression in the course of pneumonia may occur (1). Parapneumonic effusion (PPE) is one of the most severe complications of pneumonia. In cases with complicated parapneumonic effusion and/or empyema, antibiotherapy itself may not prevent disease progression. Management of PPE may involve interventions in addition to antibiotherapy such as pleural drainage and intrapleural fibrinolytic therapy (2). Although the prevalence of pneumonia and PPE are not different between pregnant and non-pregnant women, application of inappropriate management strategies may pose danger to both mother and fetus. Maternal physiologic adaptations to pregnancy results in pneumonia being less well tolerated during pregnancy. Pregnancy increases the risk of maternal complications from pneumonia, including the need for mechanical ventilation in 10-20%, bacteremia in 16%, and empyema in 8% of cases. Management of PPE may be different than that recommended in the general management guidelines of PPE and the data for pregnant population is lacking (3,4). We aim to review the published literature on the management of parapneumonic effusions in pregnant women.

It was previously reported that up to 57% of patients hospitalized with bacterial pneumonia were complicated by parapneumonic effusion (5,6). Furthermore, development of parapneumonic effusion increases the morbidity and mortality besides treatment expenses (7). Management of parapneumonic effusion is one of the most challenging situations in clinical practice of respiratory physicians. Although there are a couple of guidelines and several published studies, the same treatment strategy according to the same guideline may lead to different results even in the similar patient groups. Because, individual factors such as the immune system and comorbidities may interact with the disease process. On the other hand, diagnosis of pneumonia in pregnant woman may be delayed due to several reasons such as withholding certain radiological imaging studies for their potential hazard to fetus. Furthermore, because initial clinical symptoms of pneumonia may be subtle and may mimic many complaints of pregnancy, misdiagnosis is common. In one series of 25 patients, 20% initially received another diagnosis before being appropriately treated for pneumonia (3).

Most PPEs occur as a complication of community acquired pneumonia (7). It was previously reported that community acquired pneumonia is the most common non-genital infection in pregnant women (8). The management of PPE involves two important decisions: (a) selection of appropriate antibiotic regimen; (b) assessment of the need for pleural drainage that is decided according to commonly used guidelines such as American Collage of Chest Physicians (ACCP) guideline of medical and surgical treatment of parapneumonic effusions (2). In a patient with community-acquired pneumonia and parapneumonic effusion, the recommended agents are second or third generation cephalosporins in addition to a macrolide such as clarithromycin. For patients hospitalized with severe community acquired pneumonia, initial treatment with a macrolide plus a third-generation cephalosporin with antipseudomonal activity is recommended. Animal studies showed that most of the antibiotics including cephalosporins and macrolides enter well into the pleural cavity when they are given through systemic routes (9,10). In terms of antibiotic selection in pregnant women with PPE, both cephalosporins and macrolides are classified as category B by Food and Drug Administration (11).

In cases with complicated PPE and/or empyema, drainage of the PPE is recommended as the second step by ACCP guideline of medical and surgical treatment of parapneumonic effusions (2). In our experience, small bore catheters (28 French) are easier to apply and tolerated well by the patients. It is very important to use ultrasound guidance for the selection of chest tube location due to fact that PPE tends to be loculated very quickly. Thoracic ultrasound is a very useful tool for the follow up of such cases without exposing patient to any sort of harm such as radiation. In cases with thicker pleural effusion or empyema larger bore catheters (38-32 French) could be placed under the guidance of thoracic ultrasound.

Instillation of IP fibrinolytics has been used in patients with complicated parapneumonic pleural effusions with the intention to improve pleural fluid drainage and avoid surgical intervention such as surgical debridement of the pleural space (2,12). If clinical and radiological improvement does not occur within the next few days, IP fibronolytic application could be used in pregnant women with complicated PPE. Although there are few previously published case

reports on the use of IP fibrinolytics in pregnant women with complicated PPE (13,14), more data available for successful intravascular use of streptokinase during pregnancy for venous thromboembolism without fetal teratogenicity, and with rare serious obstetric complications or adverse effect (15). Ulutas and colleagues used 250.000 IU streptokinase in 100 mL of saline for the IP instillation through chest tube for 2 or 3 days in the cases they reported without any maternal and fetal side effects or complication (13). Torbic et al. reported a 35 year old pregnant woman with 32 weeks of gestation who had PPE and was successfully treated with IP instillation of tissue plasminogen activator (tPA) via chest tube (14). They reported that 2.5 mg of tPA was administered for one day provided a significant clinical and radiological improvement in their patient. No side effect or complication was reported.

White blood cell count, C-reactive protein, and procalcitonin are the serum markers used in the clinical practice to follow up cases with severe bacterial infections. Recently it is suggested that procalcitonin is superior to others because it is more specific for bacterial infections and it's half life is shorter (16). Procalcitonin secretion begins within 4 h after stimulation and peaks at 8 h. Although, there is no previously published report comparing these inflammatory markers in pregnant women with pneumonia and parapneumonic effusion, we use especially procalcitonin for the follow up of pregnant women with PPE (17). If there is no improvement in the clinical picture and serum procalcitonin levels in one or two days we proceed to the next management step recommended in the ACCP guideline (2).

The drainage of the PPE and decortication by video assisted thoracoscopic surgery (VATS) is the next step recommended in cases of PPE or empyema with no improvement in spite of previously suggested steps (2). There are two previously published case reports of the usage of VATS in pregnant women (18,19). Oshodi et al. reported a pregnant woman with 25 weeks of gestation in whom VATS was performed for the treatment of empyema due to community-acquired streptococcus pneumonia (18). Decortication and debridement of large loculated empyema was done with VATS after conservative medical treatment was failed. In the second article by Kim et al, authors performed VATS in a 38 years old pregnant woman with 24 weeks of gesta-

tion for the treatment of lung cancer (19). They have performed lobectomy along with mediastinal lymph node dissection without any complication. The mother gave a birth to a very healthy boy.

In conclusion, the prevalence of pneumonia and parapneumonic effusion is not higher in pregnant women compared to normal population. Although the data is very limited, the management of PPE as recommended by common guidelines such as ACCP guideline of medical and surgical treatment of parapneumonic effusions could be used in pregnant women with PPE with more attention not to harm the fetus. Delaying the treatment may cause serious consequences for both mother and fetus. Thoracic ultrasound and procalcitonin could be used in the monitoring of treatment.

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