Acute respiratory distress syndrome in acute pyelonephritis during pregnancy: ten-year review

Peer review status:
No

Corresponding Author:
Dr. A. Isabel M Fernandez,
Ana Isabel M.Fernandez, Obstetrics & Gynecology Valdecilla, 39009 - Spain

Submitting Author:
Dr. A. Isabel M Fernandez,
Ana Isabel M.Fernandez, Obstetrics & Gynecology Valdecilla, 39009 - Spain

Article ID: WMC004689
Article Type: Systematic Review
Submitted on: 03-Sep-2014, 11:14:17 PM GMT   Published on: 04-Sep-2014, 10:22:41 AM GMT
Article URL: http://www.webmedcentral.com/article_view/4689
Subject Categories: OBSTETRICS AND GYNAECOLOGY
Keywords: Respiratory failure, acute pyelonephritis, complication, pregnancy

How to cite the article: Fernandez AM. Acute respiratory distress syndrome in acute pyelonephritis during pregnancy: ten-year review. WebmedCentral OBSTETRICS AND GYNAECOLOGY 2014;5(9):WMC004689

Copyright: This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC-BY), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Source(s) of Funding:
Any institution is the source of funding

Competing Interests:
None
Acute respiratory distress syndrome in acute pyelonephritis during pregnancy: ten-year review

Author(s): Fernandez AM

Abstract

Acute pyelonephritis (AP) is one of the most common medical complications of pregnancy. About 20% of women with severe pyelonephritis during pregnancy develop complications that include anaemia, septic shock syndrome, acute respiratory distress syndrome (ARDS), preterm labour, intrauterine growth retardation... AP may result in significant maternal morbidity and fetal morbidity and mortality. An early diagnosis and treatment with parenteral antibiotics are essential to avoid complicated AP and obstetric complications.

Objective

To describe cases of ARDS as a complication of AP during pregnancy in a period of ten years in a public healthcare area, and to analyze their management and perinatal outcomes.

Study design

It was performed a retrospective cohort study of obstetric patients admitted to an intensive care unit (ICU) for ARDS as a complication of AP from 2001 to 2011 in public healthcare I of Cantabria (Spain).

Results

The study was performed using medical records of one hundred and fifty-nine AP during pregnancy that were admitted to a hospital from 2001 to 2011 between 42798 pregnancies delivered in this period (prevalence 0.0036%; incidence 3.6 per 1000). Three cases of ARDS were identified (prevalence 0.00006; incidence 0.06 per 1000) between AP in that period.

The severity of the clinical condition required treating these three patients in an ICU. The review reported that all of them were nulliparous women, Hispanic, with an average age of 27 years old; their obstetric follow-up visits have no abnormalities (universal screening for asymptomatic bacteriuria was negative); they were diagnoses with AP on the right side in the last weeks of second their second trimester of pregnancy. In the first five days of a course of empiric intravenous antibiotic therapy, they developed ADRS and they were moved to an ICU; in two cases, the severity of the clinical condition necessitated treating both patients by mechanical ventilation with high positive-end expiratory pressure while the other patient improved quickly on fluid restriction and intravenous diuretics. Only one of the patients required emergent cesarean delivery for worsening respiratory function and fetal distress, but the others spontaneously delivered after 40 weeks of pregnancy. In all of cases, infants were healthy and umbilical artery pH was > 7.20.

Discussion

AP is one of the most common medical complications of pregnancy. In fact, it is the leading cause of hospitalization for non-obstetric indications in pregnant women. It occurs in 1-2% of pregnant women in the setting of routine prenatal screening for asymptomatic bacteriuria. AP may result in significant maternal morbidity, as well as fetal morbidity and mortality. Although the clinical course of pyelonephritis in pregnancy was described long time ago, recommendations for screening for asymptomatic bacteriuria, newer diagnostic techniques, the development of antibiotic resistance, changing microbial virulence factors and new antimicrobials, may affect diagnosis, clinical course and management of pyelonephritis actually.

The predisposition for pyelonephritis during pregnancy is primarily due to pregnancy-related anatomic changes in the urinary tract, such as pressure on the bladder from enlarging uterus, increase in the size of the ureters due to smooth muscle relaxation, dextro-rotation of the uterus, and, in addition, the immunosuppression of pregnancy may contribute to develop pyelonephritis in this period. The risk appear to be modestly increased in nulliparous and young women, and the majority of cases occur on the right side, because of uterus position, and in the second trimester; however, maternal morbidity and obstetric outcomes do not appear to differ by trimester.

It has been estimated that as many as 20% of women with severe pyelonephritis develop complications that
include anaemia, bacteremia, septic shock syndrome, acute respiratory syndrome, acute renal failure, transfusion, intrauterine growth retardation, preterm labour... ARDS clinically is characterized by severe hypoxemia, diffuse bilateral pulmonary infiltrates, dyspnea and decreased lung compliance. It was described in 1967 by Ashbaugh in patients having acute respiratory distress, cyanosis refractory to oxygen therapy, decreased lung compliance and diffuse infiltrates evident in the chest radiograph. The definition was standardized in 1994 by the American-European Consensus Conference Committee. The new definition recognizes that the severity of the clinical lung injury varies: the patients with less severe hypoxemia with the ratio of partial pressure of arterial oxygen to the fraction of inspired oxygen (PaO2/FiO2) less than or equal to 300 are considered to have acute lung injury, and those with more severe hypoxemia with PaO2/FiO2 less than or equal to 200 are considered to have ARDS. The incidence of ARDS in pregnancy is very low and its causes can be: septic abortion, abruption placentae, obstetric hemorrhage, acute pyelonephritis....In general, any septic condition in pregnancy may be complicated by respiratory failure and it must be suspected when signs of hypoxia appear during any infection.

Based upon the higher risk of complications in pregnant women, AP was traditionally been treated with hospitalization and intravenous antibiotics until the woman is afebrile for 24 hours and symptomatically improved. Although there is no evidence that bacteremia portends a worse prognosis or requires longer therapy, it is reasonable to obtain blood cultures in women with signs of sepsis or serious underlying medical conditions, such as diabetes. The initial choice of antibiotics should be guided by local microbiology and susceptibility data; parenteral beta-lactams are the preferred antibiotics and, once afebrile for 48 hours, patients can be switched to oral therapy to complete 10 to 14 days of treatment.

Pyelonephritis is not itself an indication to finish pregnancy if woman and fetus have no serious complications. If there were standard obstetrical indications to induction of labour or cesarean delivery, we favor waiting until the patient was afebrile, as long as delaying the delivery is relatively safe for the mother and fetus.

Conclusion

It was observed that incidence and risk factors in this healthcare area are similar to data obtained from the literature. ARDS must be suspected in those pregnant patients suffering urinary tract infection in which signs of hypoxia appear, in special, during the second or third trimester. Early recognition of the syndrome, closed monitoring and vigorous treatment can prevent maternal complications and fetal distress.

References